



Proceedings of the 10th European Conference on Social Media

**A Conference hosted by
Pedagogical University of Krakow
Poland**

18-19 May 2023



**Edited by
Dr Iwona Lupa-Wójcik and
Dr Marta Czyżewska**

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Proceedings of the

**10th European Conference on
Social Media**

ECSM 2023

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Hosted By**

**Pedagogical University of Krakow
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E-Book ISBN: 978-1-914587-66-5

E-Book ISSN: 2055-7221

Book version ISBN: 978-1-914587-65-8

Book Version ISSN: 2055-7213

Published by Academic Conferences International Limited

Reading, UK

+44 (0) 118 324 6938

www.academic-conferences.org

info@academic-conferences.org

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ECSM Preface

These proceedings represent the work of contributors to the 10th European Conference on Social Media (ECSM 2023), hosted by Pedagogical University of Krakow, Poland on 18-19 May 2023. The Conference Chair is Dr Iwona Lupa-Wójcik and Programme Chair is Dr Marta Czyżewska, both from Pedagogical University of Krakow, Poland.

ECSM is now a well-established event on the academic research calendar and now in its 10th year the key aim remains the opportunity for participants to share ideas and meet the people who hold them. The scope of papers will ensure an interesting two days. The subjects covered illustrate the wide range of topics that fall into this important and ever-growing area of research.

The opening keynote presentation is given by Dr Katarzyna Bąkiewicz, SWPS University, Poland on *Disinformation is Everywhere. Why Should we Change our Perspective on this Phenomenon?* On the second day, Magdalena Urbaniak from AGH University of Science and Technology in Kraków, Poland, will give a talk on the subject: *Brain Unconsciously Driven by Social Media. Is it bad or good and what can we do about it?*

With an initial submission of 107 abstracts, after the double blind, peer review process there are 33 Academic research papers, 6 PhD research papers, 2 Masters Research papers and 4 work-in-progress papers published in these Conference Proceedings. These papers represent research from Austria, Canada, Czech Republic, Egypt, France, Germany, Ghana, Greece, Hungary, India, Ireland, Italy, Kenya, Lithuania, Netherlands, New Zealand, Nigeria, Poland, Portugal, Romania, Singapore, Slovak Republic, South Africa, Spain, Turkey, UK, Ukraine, United Arab Emirates and the USA.

We hope you enjoy the conference.

Dr Iwona Lupa-Wójcik
Pedagogical University of Krakow
Poland
May 2023

ECSM Conference Committee

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Biographies

Conference and Programme Chairs



Dr Iwona Lupa-Wójcik, Doctor of economic sciences in the discipline of management sciences. Author of a doctoral thesis entitled, "Marketing potential of social media", as well as three popular science books on social media. The author's scientific achievements also include several dozen scientific articles on social media. Implementer of many research and practical projects related to social media. Beneficiary of numerous scholarships. The main performer of scientific grants dedicated to social media. An active participant in numerous nationwide and international conferences devoted to management, marketing and social media. She has ran a business for many years related to, among others, social media services for business clients. Entrepreneurship trainer, salesman, marketing and business strategy specialist. Assistant Professor at Department of Entrepreneurship and Social Innovations, Institute of Law and Economics, Pedagogical University of Cracow.



Dr Marta Czyżewska, Assistant Professor at Department of Entrepreneurship and Social Innovations, Institute of Law and Economics, Pedagogical University of Cracow. 22 years of experience as a trainer, lecturer and researcher, provides training in entrepreneurship, social entrepreneurship, accounting and finance. Research focused on entrepreneurship, social entrepreneurship, innovativeness financing and startups development. Advisor and consultant for companies, startups in applying for EU funds, business modelling, financial analyzes, business planning, business processes audits. She works with different target groups: students, companies' employees, unemployed and entrepreneurs. Author of book on "Startups, innovation and risk" (in Polish language) and many scientific articles on entrepreneurship. Formerly head of the Centre for Innovation and Entrepreneurship at University of Information Technology and Management, manager of seed capital fund "InnoFund". Presently, also owner of Training, Research & Development Marta Czyżewska.

Keynote Speakers



Magdalena Urbaniak is a brand communication expert. Founder of the MaxTractor agency, specializing in building and implementing marketing strategies. Magdalena has worked with brands such as Bayer, PepsiCo, BNP Paribas, and the National Museum in Poznań. She is a Lecturer at the University of Wrocław, the University of Economics, the WSB University, SWPS in Wrocław, and the AGH University of Science and Technology in Kraków. Magdalena speaks on conference stages (including TedX, Infoshare, loves Marketing, and Online Marketing). You can find her articles in industry magazines (including PR Manager, Social Media Manager, Marketer+) and on her own blog: Tractormania.pl and magdaurbaniak.com



Dr Katarzyna Bąkowicz is an Assistant professor and lecturer in Journalism and Social Communication at the SWPS University. Co-founder of the Central European Digital Media Observatory, where she conducts research in the field of disinformation and implements communication projects. Assessor of the European Fact-Checking Standards Network, member of the board of the Advertising Council. United Nations expert and head of the Working Group on Ethics and Responsible Communication. Strategist and consultant in business and media communication: creates and implements internal and external communication solutions. She supports

the organization's image activities in the area of PR and CSR. Author and producer of radio and television programs in the field of business and communication.

Mini Track Chairs



Prof. Dr. Abbas Fadhil Aljuboori is working currently at Al Zahra College for women, Information Technology Department, Muscat, Sultanate of Oman as a faculty Staff Member. He has a Ph.D. in Computer Science from Dongguk University, SOUTH KOREA. Fulbright Visiting scholar – University of Central Oklahoma – Edmond – USA –2017. International Advisory Board Member for CT University in India. His field of Interest are in Data Mining, Web Applications, Big Data, Data Security, Information Systems, Social Media Analysis, and Smart Applications. He is a Member of several of Academic and Professional Societies. He is an Editor-in-Chief, Editorial Board Member and Reviewer of many eminent International Journals and Conferences worldwide.



Dr Joanna Rosak-Szyrocka, is a Lecturer at Częstochowa University of Technology in Poland, the Vice President of the Qualitas Foundation and a member of the Polish ISO 9000 Forum Club. Joanna has author/co-authored 221 scientific publications in prestigious journals, chapters in monographs and conference materials as well as co-authoring 20 scientific monographs. She has been a participant of the Erasmus + international exchange, during which she conducted a series of international lectures in England, Slovenia, Slovakia and Italy.



Dr Robert J. Wierzbicki graduated at Wroclaw University of Technology in Electronics specializing in Device Technology. He first worked at the Fraunhofer Institute for Integrated Circuits in Erlangen, Germany, and was later appointed research assistant to the Chair of Electron Devices at the University of Erlangen-Nuremberg, Germany. Dr. Wierzbicki holds the doctorate in engineering sciences. In 2003 Dr. Wierzbicki was appointed professor of Online Media at the University of Applied Sciences in Mittweida, Germany. Professor Wierzbicki is expert in digital media, author of numerous publications and winner of prestigious awards in communication media.



Justyna Żywiołek is a doctor of engineering at the Faculty of Management of the Częstochowa University of Technology. She deals with the management of information and knowledge, and their security. Justyna is also a personal data protection inspector and an auditor of the ISO 27000 standard. She is interested in the use of Big Data, Internet of Things for security management systems. She is guest editor of many international magazines. Justyna is the co-author of over 150 publications, including articles published in peer-reviewed journals, book chapters, conference materials, and research reports

Biographies of Contributing Authors

Ayobami Adekola is a research fellow at the University of South Africa's Institute for Gender Studies. He has a PhD in public health and has published articles in high-impact journals. He is an experienced academic editor, educator, and researcher. His research interests are qualitative modelling, HIV, sexual and reproductive health, gender studies, and health education.

Zinaida Adelhardt is a research fellow at the Friedrich-Alexander University Erlangen-Nürnberg (Germany) and a head of the media withdrawal project. She received her doctoral degree from the

Leipzig University (Germany). Her doctoral thesis analyzed identity construction of teenagers in social networking sites.

Susana Aldeia is an Assistant Professor at the Portucalense University (UPT) and Polytechnic Institute of Maia (IPMAIA). She holds a PhD in Taxation and a DEA from the Vigo University (Spain) in Tax Law; a postgraduation in Taxation from the IPCA and a degree in Accounting, also from the IPCA.

Zeyad Alghamdi is a Computer Engineering PhD student at Arizona State University, working in Data Mining and Machine learning lab (DMML) under the supervision of professor Huna Liu. His main research is in social media mining and mental health in social media.

Suaad Almalki is a doctoral student at Aston University, UK. She also works as a lecturer at Taif University, Saudi Arabia, in the information system department. She received her MSc degree from Aston University in 2019 in information systems and business analysis. Her main research areas are social media, information systems and data analysis.

Srinaath Anbu Durai is a first year doctoral student at HEC Paris. He received his Master of Science in Computer Science from Singapore Management University in 2022. His main research areas are understanding socio-economic phenomena through social media and AI adoption in society.

Agustín Baidez is an Assistant Professor of the Faculty of Economics and Business Administration at the University of Castilla-La Mancha, Spain. His research lines developed are framed in the field of consolidation of financial statements, and environmental responsibility.

Caitlin Begg is the founder of Authentic Social and an independent sociological researcher in New York, USA. She founded Authentic Social after the 2016 publication of her Harvard undergraduate honors sociology thesis "Virtual Impressions: The Effect of Digital Communication on Millennial Social Interaction". Her main research areas are technology's effect on conversation and sociotechnical systems.

Svitlana Butova is a Certified Social Media specialist. She has 5 years of experience in more than 20 niches of businesses in Ukraine, Europe and Australia. Since April 2022 she has been a communications manager at the All-Ukrainian NGO Girls. Her main areas of expertise are communications, building the organization's brand, and conducting media campaigns on socially important topics.

Daria Dodan is a master's student at Babeş-Bolyai University, Romania, currently studying Counseling and Psychological Interventions in Human Development. She received her bachelor's degree in psychology from Babeş-Bolyai University in 2022. The focus of her research is on the effects of using social networking sites on adolescents' psychosocial functioning, including identity formation and digital stress.

Kim Anh Dao is a fulltime PhD student at Tomas Bata University in Czech Republic. She received her Master of Administration in James Cook University in Singapore. Her main research area is marketing, consumer behaviour.

Sara dos Santos is currently Invited Adjunct Professor in the field of Digital Marketing at the Accounting and Business School of University of Aveiro and Polytechnic Institute of Viseu. She holds a PhD in Management and Business studies by University of Porto. Her main research areas are digital marketing, advertising and social media.

Thomas Eberle is a leader of several research units at the Friedrich-Alexander University Erlangen-Nürnberg (Germany) and an overall head of the "Classroom under Sails" project. His doctoral thesis analyzed media use of adolescents and his habilitation was focused on experiential learning outdoors.

Hadia Fakhreldin: Professor of International Business (British University in Egypt). Vice Dean for Teaching and Learning at the Faculty of Business, Economics and Political Science. Obtained her B.S.C degree in Economics (American University in Cairo) and her Ph.D. from Cairo University. Her research interest/focus is in the areas of SME development, internationalization, sustainability and cross-cultural management.

Maria Rita Filocamo is Ph.D. student (Department of Economics, Management and Institutions) at University Federico II of Naples, Italy. Her main research areas are corporate social responsibility, sustainability and green finance. She is a member of AIDEA (Italian Academy of Management).). She is affiliated at EAA (European Accounting Association).

Rubina Michela Galeotti, is a PhD Student in Business Administration from Roma Tre University. She is a member of SIDREA, AIDEA (Italian Academy of Management). She is affiliated at BAFA and EAA (European Accounting Association). Her research interest focuses on social media and accounting, strategic management, corporate strategy and accounting.

Caroline Gans Combe serves as an Associate Professor of Economics, Data, and Ethics at INSEEC Business School. Additionally, she holds the position of Head of Structured Research for the Omnes Education Group, a prominent global education institution that encompasses 11 schools specializing in management, economics, business, engineering, and data, among other fields. A distinguished member of IEEE, she has devoted her recent research efforts to the study of ethics, research ethics, data ethics, value creation, and sobriety models, with a particular emphasis on AI economics. Her extensive contributions to the field include over 44 peer-reviewed publications and chapters, as well as participation in more than 30 conferences as a keynote speaker.

Valerie Priscilla Goby, PhD (Bus), PhD (Comm), FHEA, SFHEA, professor at Zayed University, Dubai, has published across a range of disciplines including business ethics, cross-cultural communication, gender studies, and CSR in journals such as Journal of Business Ethics, Leadership and Organisation Development, and Women's Studies International Forum. Orcid: <https://orcid.org/0000-0002-9370-0609> Google scholar: https://scholar.google.ae/citations?user=dESP3_8AAAAJ&hl=en

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Invited Keynote Paper

Disinformation is Everywhere. Why Should we Change our Perspective on this Phenomenon?

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Abstract: Disinformation is a complex phenomenon, although we associate it mainly with politics and the media. However, its tools and consequences can be seen in various areas of social life. Understanding the nature of disinformation, its mechanisms and possible ways of influencing it seems necessary to fully understand this phenomenon. Campaigns targeting minority groups, manipulation in business, falsified messages in the area of health, tools of political propaganda or pseudoscience are examples of disinformation that allow you to see it in a broad perspective. And only this will allow you to develop a system of immunity to fake news.

Keywords: disinformation, misinformation, fake news, manipulation, resilience

1. Introduction and methodology

Most of us associate disinformation only with media and politics, and we are right – there are numerous examples of fake news and manipulation in these areas. However, we need to broaden our perspective and recognize that disinformation is a more complex phenomenon that can also be found in unexpected places. This broader perspective can help us understand disinformation and build resilience against it. When we recognize the connections between disinformation and stereotypes, understand the tools used by creators, and are aware of the consequences and manipulation techniques, we can change our beliefs and behaviors. We must be vigilant for disinformation everywhere, but we don't need to be afraid of it because we are aware of it and know how to neutralize it.

In this article, I will try to provide a different perspective on disinformation. I will start by discussing stereotypes and exclusions, and then delve into disinformation in the health sector, media, and politics, as well as its serious consequences in business and prevalence of fake news in science. By highlighting the various contexts in which disinformation can occur, we can start to consider strategies to counteract it. My goal is show, why broader perspective is essential to understand disinformation and create resilience attitude. If we would like to fight with fake news and manipulated information, we need to deep understanding of the problem in order to find a remedy for it. The sources that I analyzed are international studies and reports on disinformation as well as the literature on the subject.

I believe that the solution lies in fostering a responsible communication system that promotes critical thinking, encourages breaking out of filter bubbles, and advocates humility in the face of ignorance. These approaches can help all of us in the fight against disinformation.

2. Information disorder

Information disorder is the overarching concept that encompasses the phenomenon of disinformation, which is characterized by chaos and the difficulty in distinguishing between real and manipulated content. Disinformation, misinformation, and malinformation are three perspectives from which we can understand the impact of information disorder. Disinformation, in particular, is the concept most commonly associated with deliberate misleading of message recipients. It can be motivated by various factors, such as financial gain, political influence, societal polarization, or simply the creation or deepening of information chaos. Disinformation is consciously distributed for specific purposes defined by the sender, often using channels that accelerate its dissemination and expand its reach to a wide audience. This is why the internet, especially social media, is a common medium for disseminating disinformation, as it can rapidly spread information without proper verification. Unlike conveying a message through lies, disinformation involves deliberate concealment or distortion of facts to create false beliefs in recipients. It is a strategic and calculated action aimed at achieving specific effects, involving all components of the information process. Understanding the intentionality behind disinformation is crucial to comprehending its nature and impact (Gans, 2004; Wardle, 2020).

The second type of information disorder is misinformation, which occurs when the sender unintentionally provides the recipient with manipulated information. Often, the sender shares this information in good faith, such as when they learn something important and want to share it with friends or family. They may write a post on a social media platform and publish it, resulting in several hundred people receiving the information in a

short amount of time. However, the author often does not verify the truthfulness of the information before publishing it, and if the message is sensational or emotionally charged, it is likely to spread widely on the web, misleading recipients. Even though the content is shared in good faith, it can still cause social harm (Wardle, 2021).

It may seem that fact-checking is the solution to this problem. However, the third type of information disorder, malinformation, demonstrates that fact-checking alone is insufficient. Malinformation involves true information that is transmitted with the intention of causing harm, such as by evoking specific, usually negative emotions. As a result, the recipient receives a factual message, but their emotional response to it may be different than if they had received it in a neutral or contextually appropriate context. Malinformation is often used in political struggles to discredit a social group or individual, portraying them in a negative light or undermining their social standing. In theory, the information may be true, but in practice, the effects are similar to disinformation. This is a dangerous phenomenon because it may not be detected by systems that identify disinformation content on social media. Content that is factually accurate and verifiable may not violate community standards, and therefore cannot be removed based on that criteria. The impact of malinformation is serious and often more dangerous than the previous two types of information disorder, as it is difficult to track and eliminate. The criteria for detecting context manipulation are not as transparent as identifying false information in content, and the social impact is significant as it is aimed at harming specific members of society (Wardle, 2020).

The basic tool of disinformation is fake news, which encompasses the space between truth and lies. Importantly, this term refers to information that is manipulated and falsified, but not entirely false, as it always contains some element of truth (Bąkiewicz, 2023). It is defined as the act of conveying a message by concealing information to lead someone to form a false belief about a given topic (Elliot, Culver, 1992), and as a phenomenon that contributes to political and social trends in 21st century societies (McNair, 2018), involving distorted signals unrelated to the truth or part of psychological warfare based on manipulating public opinion (Alwairi, Alwahedi, 2018).

All of these phenomena can occur due to the existence of information bubbles. This phenomenon consists of social preferences to surround oneself with people who share similar beliefs, while rejecting those who hold different views and content that does not align with one's worldview. As a result, recipients of information avoid conflicting messages, intellectually isolating themselves from their environment. This leads to a self-perpetuating cycle of opinions, where people are locked into echo chambers, repeating the same content and surrounding themselves with information that confirms their preexisting beliefs. Over time, they may perceive everyone as saying and thinking the same thing, further reinforcing their beliefs and contributing to polarization and social divisions (Michelucci, 2013). This echo chamber effect fosters extremism, as individuals within these bubbles become less critical and more unified in their beliefs, even if they are based on false information (Szpunar, 2014). Consequently, individuals may avoid expressing differing opinions within their social group for fear of ostracization or exclusion, leading to a phenomenon called the spiral of silence, where individuals prefer to remain silent to maintain their perceived social safety (Noelle-Neumann, 1974).

The complexity of information disorder phenomena shows how complicated the modern information ecosystem is. It is easy to find manipulated or falsified content that can be found and cause damage in many social areas.

3. Areas of disinformation

3.1 Minorities

More than half of the surveyed Poles have encountered the phenomenon of disinformation, nearly a quarter of them say that they come into contact with manipulation every day or several times a week, and half indicate politicians as the creators of disinformation, and this is the area we most often associate the phenomenon with (NASK, Studies). However, it is not only in the area of politics that we can see disinformation activities, distortions, manipulations and half-truths can be found in many other areas of social life. And although they are not always visible, their consequences are clearly felt.

The first area marked by disinformation is minority communities, such as LGBT+ people, migrants, Gypsies, and Jews. There is no community that does not oppress and discriminate against its minorities. Here, we are dealing with the correlation of misinformation with the phenomenon of stereotyping, which divides people into those who are right, belonging to a given social group, and those who should be excluded from the group as not conforming to its idealized version (Girard, 1987). Organized disinformation campaigns against LGBT+ people continue. According to European Union research, representatives of this minority are among the main targets of disinformation attacks, and pro-Kremlin organizations are responsible for their creation and implementation.

Most often, disinformation messages contain a narrative that portrays LGBT+ as a new form of colonization of the West, a threat to the traditional family model, the safety of children and youth, and the natural order related to procreation. This is particularly visible in the countries of Eastern and Central Europe, where public debate creates fertile ground for the implementation of such messages. As a result, 30 percent of people from this minority admit that they have experienced harassing comments, threats, acts of aggression, or other similar incidents. The authorities are often an active party in such activities, for example, by creating LGBT+ free zones, as is the case in Poland, Bulgaria, Finland, Greece or Spain (Strand et al., 2021).

Disinformation publications also heavily impact migrant communities. According to the EUvsDisinfo study, the amount of manipulated information in this thematic area is twice as much as in other areas. The basic narrative is that migrants pose a threat to European culture and identity, supported by stories of various European cities allegedly abandoning Christmas traditions or children being forced to pray to Allah in schools. The narrative of Islamization is prominent in many publications, suggesting that Muslims will soon outnumber Europeans, depriving the natives of jobs, housing, and social privileges. Another narrative portrays migrants as a criminal or terrorist threat, with a particular emphasis on rape. While messages about migrants as an economic threat are weaker and less radical than in previous years, they are still present. In Poland and Italy, migration is also presented as an element exacerbating tensions between EU countries. This contributes to an increase in aggressive behavior towards representatives of minorities and intensifies the isolation of its members, who, in order to feel safe, often close themselves in ghettos instead of integrating with representatives of other European cultures (The impact of disinformation..., 2021).

Manipulated information messages also target people of non-white skin color. Despite efforts to combat racism, its manifestations are still evident, especially in areas such as education, employment, housing, healthcare, and public services. Media and social messages about individuals with non-white skin color often perpetuate negative beliefs and behaviors towards them. They are more harshly judged by the courts, receive higher penalties for crimes more frequently, and are often associated with criminal behavior and aggression (Champa, 2021). In news coverage, they are portrayed as more dangerous when they become the subjects of daily news, often overrepresented as criminals and underrepresented as victims or contributors. This trend is also observed in music videos and cultural products targeted at young people. As a result of such messages, stereotypes are reinforced, and exclusionary beliefs are intensified, leading to a diminished quality of life for individuals belonging to these groups (Media portrayals...).

Furthermore, representatives of the Roma and Jewish populations face a significant disinformation narrative. Messages about them are based on contempt, expressing low social status, dishonesty, lack of ethics, or socially unacceptable behavior. Anti-Roma narratives are included in the political programs of populist nationalist parties, such as those in Hungary, Slovakia, and the Czech Republic. Similarly, anti-Jewish narratives are propagated by politicians in Poland, such as the Konfederacja party. As a consequence of disinformation, events such as social lynching occur, such as the attacks on two Gypsies groups in the suburbs of Paris in 2019 (Banaji, Bhat, 2019).

Disinformation messages rooted in stereotypes contribute to exclusion. Despite discussions about equality and its importance in modern societies, there are unfortunately not only isolated incidents, but also organized campaigns targeting specific groups.

3.2 Health

Health is another critical sphere of our lives that is impacted by disinformation. During the COVID-19 pandemic, we faced not only disinformation but also an infodemic, where an overwhelming amount of false information posed a threat to the stability of the information ecosystem. Speculations about the origin and sources of the virus emerged, accompanied by various conspiracy theories, ranging from claims that the virus was planned by the Rockefeller Foundation, to suggestions that it was a means to solve overpopulation, or that COVID-19 vaccines contained electronic tracking chips. Tragically, some individuals died after consuming chlorine or refusing treatment based on unfounded beliefs in self-healing through willpower. The consequences were not limited to health alone, as research indicates changes in trust towards government, particularly among the younger generation during the pandemic (Trust in government..., 2020). Skepticism about vaccines also increased due to media reports about adverse effects. People began to fear vaccines more than the potential complications of the infection itself (Belanger, 2020).

The disinformation surrounding the Blue Whale Game, which was ultimately revealed to be a global hoax, had serious consequences. In 2017, when countries around the world were grappling with the health and well-being of young people, the story of a mysterious game that allegedly drove teenagers to suicide, created by a Russian

journalist, gained widespread attention. The tasks attributed to game administrators, which were never substantiated, circulated on the internet and served as a classic example of a disinformation narrative amplified by the media. According to the narrative, young people were supposed to find their "guardian" by using a specific hashtag, who would then guide them through a series of tasks, culminating in suicide. At that time, questioning the existence of the game required great courage, as the belief in its existence was so prevalent that it went unquestioned. Tragically, the consequences were all too real, as teenagers in Poland and around the world engaged in self-mutilation and attempted suicide, with some cases resulting in tragic loss of life (Bąkiewicz, 2020).

Similar consequences are faced by victims of disinformation about vitamin C and its alleged connection to cancer. In Poland, Jerzy Zięba is a prominent figure behind the false narrative of a miracle drug, offering ethically questionable treatments for seriously ill patients based on falsified data and research. He capitalizes on the social trend of declining trust in the medical community (Poland ranks among the lowest in Europe in this regard) and combines it with a well-crafted conspiracy theory centered on a global population reduction plan (Pluta, Pseudoscience...). Similar patterns can be observed at CHIPSA, or Centro Hospitalario Internacional del Pacifico in Mexico, which claims to offer integrative cancer treatment. Unfortunately, this type of disinformation is highly dangerous, as evidence has shown that some medical services offered through manipulated messages have resulted in negative health effects, permanent damage, or even death for patients (Ohlheiser, 2021).

When discussing the areas impacted by disinformation in the health sector, it is important to highlight the beauty sector, which boasts a market value of \$250 billion and is rife with half-truths and misleading content. A prevalent form of disinformation in this sector revolves around the cult of beauty, where idealized bodies with smoothed and slimmed appearances are depicted through graphic programs. Pseudo-experts or even actors posing as doctors often recommend various supplements, perpetuating such disinformation. This has detrimental effects on trust in doctors and science as a whole, leading to a rejection of expert knowledge in favor of destructive disinformation messages that harm society at large (de Regt et al., 2019).

3.3 Business

Unfortunately, the realm where disinformation has been proliferating rapidly in recent years is the business sector. Its impact is particularly significant in the stock market, where disinformation messages can influence share prices and, consequently, the overall value of a company. Such actions are feared by nearly 60 percent of large companies in the United States (Global fraud, 2020).

Disinformation in business can take two forms: the creators and the victims of disinformation. In the former, we can observe what is known as "washing," which involves using social phenomena to enhance one's image. Companies create disinformation messages that purportedly inform the public about non-business activities for a specific group or area, while the reality may be different. Often, disinformation in the business sector pertains to environmental issues, known as greenwashing, where false claims are made about an entity's commitment to environmental protection, when in fact the opposite may be true. Market research clearly demonstrates how greenwashing impacts consumer behavior and leads to erroneous decisions. The scale of this phenomenon is significant, as a study conducted by the American consulting agency Terrachoice found that out of over 1,000 products tested in American supermarkets, which were promoted as environmentally friendly, only one was truly free from greenwashing (Terrachoice, 2007).

Pinkwashing, also interchangeably referred to as rainbowwashing, involves apparent activities that claim to support non-heteronormative individuals. However, in reality, it is a strategy used to shift the focus away from overt discrimination, exclusion, or violence, disguised under the guise of inclusive rhetoric. The concept of LGBT+ pinkwashing was coined in 2011, in reference to the Israeli government's public relations activities related to homonationalism and the exploitation of sexual minorities to justify racism and xenophobia (Abdelmoez et al., 2022).

Similar to pinkwashing, sportwashing is a set of practices employed by individuals, companies, or countries to repair or enhance their reputation using sports. The most common form of sportwashing is organizing sporting events, ranging from local tournaments to world championships, or owning a sports team or club, such as Paris Saint-Germain, which is owned by a subsidiary of a Qatari sovereign wealth fund and has faced criticism for unethical actions (Fruh et al., 2022).

In the aftermath of the war in Ukraine, a new phenomenon called warwashing emerged, which involves feigned aid activities and a disparity between declarations and actual aid provided to war victims. This may include

changing logos to Ukrainian colors or claiming withdrawal from the Russian market despite lacking actual plans to do so (Korcz, Podus, 2022).

The business environment is often targeted by disinformation propagated by trolls, profiteers, and foreign entities. Trolls are individuals or groups that engage in anti-social behavior online, particularly in places where discussions take place. They launch disinformation attacks in the form of entertainment or hate speech publications, with the aim of destabilizing discussions, misleading other participants, and tarnishing the reputation of companies. Trolls generate up to 12 times more content, often using colloquial language and profanity, and they respond to almost every comment that references their statements (Musiał, 2017).

Profiteers, on the other hand, profit from the distribution of disinformation through business speculation. Their actions can weaken companies and their position in the industry by spreading messages about alleged crises or the unprofitability of entire sectors. These messages can take the form of single statements or organized campaigns against competing entities. In the most dangerous form, disinformation is propagated by foreign entities, where the level of organization is even higher and involves the participation of governments and authorities in disinformation campaigns. Such organized groups have been identified in 48 countries, most notably in countries that claim global dominance. This type of disinformation is particularly dangerous as it is challenging to track and carries serious risks for businesses, including potential collapse (Nemr, Gangware, 2019).

3.4 Politics

The connection between politics and disinformation has existed for centuries. One of the earliest known examples of disinformation in an election campaign dates back to the fight between Octavian and Mark Antony, where Octavian spread disinformation about his opponent using coins.

In modern times, Donald Trump was the first prominent politician to widely use the terms "disinformation" and "fake news." He first used these terms in a Twitter post in December 2016, and by the time of the first presidential debate, he had repeated them 1,906 more times. Data from The Washington Post's Fact Checker's Database revealed that Trump made an average of 23 false or misleading tweets per day, creating what the media referred to as a "tsunami of untruth" that influenced political discourse. In 2019, Trump even claimed credit for coining the term "fake news." Trump's extensive use of disinformation during his election campaign, particularly on Facebook and Twitter, contributed to the impact of these platforms on the political beliefs of their users (Woodward, 2020). The disinformation narrative amplified by Fox News further reinforced false beliefs, leading to the attack on the U.S. Capitol in January, which resulted in the loss of 5 lives.

Brexit was a significant consequence of political disinformation, with the narrative of Euroscepticism playing a crucial role on the Twitter platform. An analysis of 7.5 million tweets revealed that users supporting the United Kingdom's departure from the European Union were not only more numerous, but also more active compared to other users. They posted more tweets containing anti-EU content, shared links to press publications that aligned with their beliefs, and engaged with like-minded individuals. Bots also played a role in amplifying this narrative, with less than 1 percent of accounts generating over a third of the content. More than 13,000 accounts were designed to disseminate information to varying degrees. The main figures in this campaign were Boris Johnson and Nigel Farage, who created and spread messages across the network (Hoeller, 2021).

The tragic effects of political disinformation can be observed in the events in Ukraine. There are four main trends of disinformation in this context: government propaganda, conspiracy theories, context manipulation, and emotional manipulation. Pro-Kremlin messages distort reality and aim to portray Russia as a victim of Western aggression, such as the alleged threat of NATO enlargement. State-owned media only disseminate information that aligns with the political interests of Russia's ruling groups. Paid trolls also play a role, writing thousands of comments online and spreading the pro-Russian narrative across various social media platforms (Paz, 2022).

The Ukrainian side also utilizes disinformation as a weapon of war, with President Zelenski having 1.4 million followers on Telegram, and the content he shares with Ukrainian society aimed at boosting morale, often adopting a heroic tone (Demagog, 2022).

All members of society are affected by political disinformation, as it undermines freedom of thought, human rights, right to privacy, right to democratic participation, and various economic, social, and cultural rights. Moreover, it diminishes indicators of democratic quality by eroding trust in the independence of democratic institutions, disrupting elections, and undermining confidence in their fairness. Additionally, it contributes to social polarization, exacerbating existing divisions (Eurobarometer, 2022).

3.5 Media

The media holds a significant, often dominant, position in the social structure. As their main role is to provide information, they shape attitudes and influence opinions and decisions. Despite the element of journalistic integrity, media outlets are also commercial enterprises where issues such as profits and ownership relations come into play. Moreover, the phenomenon of convergence, which has blurred genres and information distribution channels, has made the media system increasingly complex. Consequently, it is not difficult for disinformation to infiltrate, often taking the form of manipulating quotes or changing context, which has an immediate effect on the perception of content. For instance, a notable example is the case of Anthony Fauci, the White House's chief medical adviser, whose interview excerpt in *The New York Times* was manipulated to create the impression of vaccines' ineffectiveness. However, reading the entire text reveals that the doctor was referring to the ineffectiveness of vaccines administered with too long intervals between doses. Media disinformation can also be created through false narratives built on distorted facts, which is challenging to detect and rectify as it requires thorough analysis and fact-checking, which recipients of the content usually do not undertake. For example, in the issue of so-called push backs, where migrants are pushed back to Belarus at the border despite crossing into the Polish side, the head of the National Security Bureau, during an interview with Radio Plus, cited a wrong example justifying the unauthorized conduct of Border Guard officers by referring to a judgment of the Court of Human Rights. Another form of media disinformation is the generation of false messages, which often occurs on internet portals through hacking of pages or profiles, leading to the creation of misleading narratives (Digital Poland, 2022)

In addition, disinformation is facilitated by clickbait, which is increasingly employed in the media, particularly in mainstream outlets. Clickbait is a short and attention-grabbing form of journalistic material that focuses on generating popularity for the content rather than delivering qualitative messages. While clickbait is often viewed as a tool for selling content rather than intentionally deceiving or manipulating the audience, it is hard to ignore the possibility that this marketing activity may contribute to the dissemination of fake news (Alves et al., 2016). The publication of clickbait itself can be considered as fake news, as it misleads the audience through headlines that are inconsistent with the actual content.

The consequences of media disinformation are numerous and grave. Firstly, they further diminish the already low level of social trust. In Poland, only 20 percent of the media are perceived as independent, leading to increased reliance on social media by a growing number of people, especially the youth. The changing nature of journalism itself does not help either, particularly with the emergence of media workers who perform similar tasks as journalists but lack the ethical codes and standards. This impacts both the volume of disinformation in the media and the industry as a whole.

3.6 Science

Unfortunately, science is not immune to misinformation, despite being expected to uphold the highest standards as a model for all other publications and content. One form of misinformation in science is pseudoscience, which relies on simplistic reasoning and selectively accepts only favorable results while disregarding data that do not support the original thesis. It often refers to concepts lacking scientific justification or combines them with scientific definitions and publications from unknown or unrecognized sources, relying on isolated and ambiguous experiments (Żukowska et al., 2021).

Pseudoscience is closely related to fake science, which distorts reality by presenting facts as non-facts and presenting pseudo-evidence as credible evidence. Fake science is the result of intentional attempts to introduce false or unconfirmed disinformation claims into the scientific discourse, often perpetuated by scientists themselves. This can create a false belief about the truth or probability of certain claims, leading other researchers to rely on them as a basis for their own studies and analyses. Fake science comprises theories and claims that may appear similar to scientific theories in terms of writing, methodology, and argumentation, but lack empirical confirmation. It can be seen as an imitation of science. Unlike pseudoscience, fake science employs a reproducible methodology and is based on true claims (May, 2019).

Research conducted in 2021 by Else and Van Noorden indicates that fake science is not limited to isolated cases, but often occurs as an institutionalized form of forgery, aided by predatory journals that prioritize profits from publications over the dissemination of high-quality content. For example, researchers from China have been found to create low-quality content in order to receive undeserved accolades. In 2020, over 1,400 scientific articles submitted by Chinese researchers were registered in biomedical journals. Although nearly 400 of these articles have been retracted after their misinformation was exposed, around 1,000 of them still remain in circulation (Turek, 2022). A similar situation has occurred with publications from Italian researcher Alfredo Fusco

and his co-authors in the field of oncology, where between 2013 and 2018, 22 articles were retracted and 10 corrections were published. Nevertheless, eight of the retracted articles have received 71 citations on Google Scholar since their retraction (Bucci, 2019).

It is not difficult to highlight the negative consequences of disinformation in science. In addition to the loss of trust in representatives of this field, the implementation of falsified or manipulated content carries a high risk. Even if only partially misinformation, the social effects remain negative. Science should remain a bastion of truth and reliability, serving as a reference point for creating a reality based on facts.

4. Tools to promote resilience

Viewing the phenomenon of disinformation in a wide spectrum allows for the development of a resistant attitude towards manipulated content, which is necessary to navigate the information ecosystem. It should begin with cooperation and cohesion among different social groups, sectors, and governments. The voices of entities such as the European Union or the United Nations are increasingly encouraging agreements and joint activities in this field. Only through mutual support and the creation of solutions to improve the fight against disinformation can we have a chance of success in the face of its rapid proliferation. Building a culture of communication, improving trust in the media and academia should be prioritized in actions against disinformation (Baptista, 2021).

Improving media literacy is of great importance in addressing this issue. The ability to think critically, evaluate, use, and create information is a key skill in the 21st century that allows individuals to navigate the information environment and make informed choices. It also promotes responsible participation in political processes and democratic elections, free from interference and manipulation (Countering disinformation..., 2022). This is exemplified by programs implemented in Europe and around the world that focus on building mental resilience to manipulation, starting with awareness of these phenomena. Familiarity with the terminology associated with techniques used to falsify reality allows for approaching information with distance and healthy skepticism (Teperic, 2022). When we are aware that disinformation can be found in every aspect of social life, we are better prepared for its occurrence and less susceptible to its harmful effects. However, if we are unaware that disinformation can be related to stereotyping, or can affect business or be present in science, there is a high probability that we may not respond to it properly when it arises. Considering the rapid technological progress and the increasing pace at which it occurs, it should be anticipated that there will be more manipulations in the years to come.

An attitude of responsibility is also crucial. We must recognize that disinformation is a concern for all members of modern societies, and we should feel accountable for it. What we read and what we share can either support a discourse based on truth or deviate from it. Therefore, it is important to break out of information bubbles and our own comfort zones, which may give us a false sense of security but ultimately distort our perception of reality. Such bubbles can contribute to the disappearance or significant reduction of awareness about the phenomenon of disinformation, making it a fertile ground for its spread. Similarly, the fear of expressing our own views and a conformist attitude that amplifies the voice of the majority can also support manipulated or polarizing content.

Building resistance to disinformation is not only necessary to address this phenomenon, but also to ensure the quality of the information that surrounds us. The examples described in this article illustrate the wide reach of disinformation and the serious consequences it can cause. Neutralizing these consequences is often challenging, which is why prevention, an approach that aims to mitigate this harmful phenomenon, becomes so crucial.

5. Discussion

Disinformation is a complex phenomenon that should be viewed in a broad spectrum. The fact that it can be pervasive highlights the dynamic and heterogeneous nature of the issue we are grappling with. In order to effectively counteract it, whether by building resilience or neutralizing its consequences, it is crucial to understand its complexity. Disinformation evolves, much like the world around us, and therefore requires constant vigilance and analysis of signals and phenomena. In-depth discussions are also important, aimed at understanding the processes that contribute to the spread and strengthening of disinformation in the social space. Viewing disinformation across the spectrum is a crucial step in building a high-quality information ecosystem, and should be a top priority for all of us.

References

Abdelmoez, J.W. , Rosenberg, T., D'Urso, S., Winget, A. R. (2022), Deviants, Queers or Scissoring Sisters of Men? Translating and Locating Queer and Trans Feminisms in the Contemporary Arabic-Speaking World, *The Palgrave Handbook of*

- Queer and Trans Feminisms in Contemporary Performance, Cham: Springer International Publishing, DOI: 10.1007/978-3-030-69555-2_16.
- Aldwairi, M., Alwahedi, A. (2018), Detecting Fake News in Social Media Networks, *Procedia Computer Science*, vol. 141.
- Alves, L., Antunes, N., Agrici, O., Sousa, C.M.R., Ramos, C.M.Q. (2016), Clickbait: you won't believe what happens next!, https://www.researchgate.net/publication/311930296_Click_Bait_You_Won%27t_Believe_What_Happens_Next (accessed on 21.04.2023)
- Badanie NASK, <https://www.nask.pl/pl/aktualnosci/2249,Badania-NASK-ponad-polowa-polskich-internautow-styka-sie-z-manipulacja-i-dezinfo.html> (accessed on 21.04.2023)
- Banaji, S., Bhat, R. (2019), WhatsApp Vigilantes: An Exploration of Citizen Reception and Circulation of WhatsApp Misinformation Linked to Mob Violence in India, London School of Economics and Political Science (LSE)
- Baptista, K. (2021), Building Resilience Against Disinformation, <https://dai-global-digital.com/building-resilience-against-disinformation.html> (accessed on 25.04.2023)
- Belanger, J. (2020) What Motivates COVID Rule Breakers? <https://www.scientificamerican.com/article/what-motivates-covid-rule-breakers/> (accessed on 21.04.2023)
- Bąkiewicz, K. (2023), Dezinformacja. Instrukcja obsługi, CeDeWu, Warszawa.
- Bąkiewicz, K. (2020), Fake news. Produkt medialny czasów postprawdy, Aspra, Warszawa.
- Bucci, E.M. (2019), On zombie papers, <https://www.nature.com/articles/s41419-019-1450-3> (accessed on 24.04.2023)
- Champa, J. (2021), Misinformation in the Media and its Influence on Racism <https://stars.library.ucf.edu/cgi/viewcontent.cgi?article=1968&context=honorstheses> (accessed on 21.04.2023)
- Countering disinformation and building societal resilience (2022), https://www.eeas.europa.eu/eeas/countering-disinformation-and-building-societal-resilience_en (accessed on 25.04.2023)
- Demagog, Dezinformacja wokół wojny w Ukrainie. Światowe narracje i trendy, https://demagog.org.pl/analizy_i_raporty/dezinformacja-wokol-wojny-w-ukrainie-swiatowe-narracje-i-trendy/ (accessed on 23.04.2023).
- de Regt, A., Montecchi, M., Ferguson, S.L. (2019), A false image of health: how fake news and pseudo-facts spread in the health and beauty industry https://www.researchgate.net/publication/335447053_A_false_image_of_health_how_fake_news_and_pseudo-facts_spread_in_the_health_and_beauty_industry (accessed on 21.04.2023)
- Konkret 24, Fałszywe przekazy: jak powstają i jak je rozpoznawać, Raport Digital Poland, <https://digitalpoland.org/publikacje/pobierz?id=4f2e2116-82a6-47b5-a984-801b5e704b56> (accessed on 19.01.2023).
- Elliot, D., Culver, C. (1992), Defining and Analyzing Journalistic Deception, w: *Journal of Mass Media Ethics*, vol. 7., Thomson Reuters.
- Fruh, K., Archer, A., Wojtowicz, J. (2022), Sportwashing: Complicity and Corruption, <https://dukespace.lib.duke.edu/dspace/bitstream/handle/10161/25569/Sportwashing%20Complicity%20and%20Corruption.pdf?sequence=2&isAllowed=y> (accessed on 22.04.2023).
- Gans, H. (2004), Deciding what's news: a study of CBS Evening News, NBC Nightly News, Newsweek and Time, Illinois.
- Girard, R. (1987), *Kozioł ofiarny*, Łódź.
- Global fraud and risk report 2019/20, <https://www.kroll.com/en/insights/publications/global-fraud-and-risk-report-2019> (accessed on 21.04.2023)
- Hoeller, M. (2021) The human component in social media and fake news: the performance of UK opinion leaders on Twitter during the Brexit campaign, <https://www.tandfonline.com/doi/full/10.1080/13825577.2021.1918842> (accessed on 22.04.2023)
- Konkret 24, Fałszywe przekazy: jak powstają i jak je rozpoznawać, Raport Digital Poland, <https://digitalpoland.prowly.com/178556-mlodzi-polacy-bezradni-wobec-dezynformacyjnego-chaosu> (accessed on 23.04.2023)
- Korcz, M., Podus, S. (2022), Czym jest warwashing, <https://www.ican.pl/b/czym-jest-warwashing/PTuQgQXvw> (accessed on 22.04.2023)
- May, A. (2019), *Fake Physics, Spoofs, Hoaxes and Fictitious Science*, Springer.
- Mc Nair, B. (2018), *Fake News, Falsehood, Fabrication and Fantasy in Journalism*, New York.
- Media portrayals and black mail outcomes, https://opportunityagenda.org/messaging_reports/media-representations-black-men-boys/media-portrayals-black-men/ (accessed on 21.04.2023)
- Michelucci, P. (2013), *Handbook of human computation*, New York.
- Musiak, E. (2017), Trolling jako przykład zagrożeń informacyjnych w cyberprzestrzeni, <https://rep.up.krakow.pl/xmlui/handle/11716/2040> (accessed on 22.04.2023)
- Nemr, C., Gangware, W. (2019), Weapons of mass distraction: Foreign State-Sponsored Disinformation in the Digital Age, <https://www.state.gov/wp-content/uploads/2019/05/Weapons-of-Mass-Distracton-Foreign-State-Sponsored-Disinformation-in-the-Digital-Age.pdf> (accessed on 22.04.2023)
- Noelle – Neumann, E. (1974), The spiral of silence: A theory of public opinion, *Journal of Communication*, vol. 24, nr 3.
- Ohlheiser, A. (2021), Facebook is bombarding cancer patients with ads for unproven treatments, <https://www.technologyreview.com/2022/06/27/1054784/facebook-meta-cancer-treatment-ads-misinformation/> (accessed on 21.04.2023)

- Paz, E. (2022), Strategic disinformation: Russia, Ukraine, and crisis communication in the digital era, https://www.researchgate.net/publication/362022036_Strategic_disinformation_Russia_Ukraine_and_crisis_communication_in_the_digital_era (accessed on 23.04.2023).
- Pluta, E., Pseudonauka – przypadek znachora Jerzego Zięby, <https://web.swps.pl/strefa-psyche/blog/18467-pseudonauka-dlaczego-w-nia-wierzimy-przypadek-znachora-jerzego-zieby> (accessed on 21.04.2023)
- Reuters Institute Digital News Report 2022, <https://reutersinstitute.politics.ox.ac.uk/digital-news-report/2022> (accessed on 24.04.2023)
- Standard Eurobarometr 96, Opinia Publiczna w Unii Europejskiej, https://poland.representation.ec.europa.eu/news/eurobarometr-96-demokracja-zagrozona-przez-dezinformacje-2022-04-08_pl (accessed on 23.04.2023)
- Starnd, C., Svensson, J., Blomeyer, R., Sanz, M. (2021), Disinformation camapaingns about LGBTI+ people in the EU and foreign influence, [https://www.europarl.europa.eu/thinktank/pl/document/EXPO_BRI\(2021\)653644](https://www.europarl.europa.eu/thinktank/pl/document/EXPO_BRI(2021)653644) (accessed on 21.04.2023)
- Szpunar, M. (2014), Internet – nowa sfera publiczna czy kamera pogłosowa?, w: M. Adamik – Szysiak (red.) Media i polityka. Relacje i współzależności, Lublin.
- Teperic, D., Denisa-Liepniece, S., Bankauskaite, D., Kullamaa, K. (2022), Resilience against disinformation, https://icds.ee/wp-content/uploads/dlm_uploads/2022/10/ICDS_Report_Resilience_Against_Disinformation_Teperik_et_al_October_2022.pdf (accessed on 25.04.2023)
- Terra Choice the six sins of Greenwashing. A study of Environmental Claims in North American Consumer Markets, https://sustainability.usask.ca/documents/Six_Sins_of_Greenwashing_nov2007.pdf (accessed on 21.04.2023)
- The impact of disinformation campaigns about migrants and minority group in the EU, [https://www.europarl.europa.eu/RegData/etudes/IDAN/2021/653641/EXPO_IDA\(2021\)653641_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/IDAN/2021/653641/EXPO_IDA(2021)653641_EN.pdf) (accessed on 21.04.2023)
- Trust in government and others during the COVID-19 pandemic, <https://cls.ucl.ac.uk/wp-content/uploads/2020/10/Trust-in-government-and-others-during-the-COVID-19-pandemic—initial-findings-from-COVID-19-survey.pdf> (accessed on 21.04.2023)
- Turek, D. (2022), Fake science – fałszywa nauka. Poważne zagrożenie czy kolejny pseudoproblem?, https://www.researchgate.net/publication/358646980_Fake_science_-_falszywa_nauka_Powazne_zagrozenie_czy_kolejny_pseudoproblem (accessed on 24.04.2023)
- Wardle, C. (2020) Understanding information disorder, C. Wardle, Understanding information disorder, <https://firstdraftnews.org/long-form-article/understanding-information-disorder/> (accessed on 20.04.2023)
- Wardle, C. (2021), The science of misinformation, <https://www.sciline.org/social-sciences/misinformation/> (accessed on 20.04.2023)
- War through Symbols, The Conflicts of the Late Republic Viewed Through Coinage <https://storymaps.arcgis.com/stories/03206d2d092f4aa6bbc5a8827bf6d6a9> (accessed on 21.04.2023).
- Woodward, A. (2020), Fake news: A guide to Trump's favourite phrase – and the dangers it obscures, <https://www.independent.co.uk/news/world/americas/us-election/trump-fake-news-counter-history-b732873.html> (accessed on 22.04.2023).
- Żukowska, J., Mikołajewska, A., Staniszevska, K. (2021), Problematyka dezinformacji naukowej, Edukacja Ekonomistów i Menedżerów, nr 61 (3), lipiec-wrzesień.

Academic Research Papers

Age Differences in the Spread of Misinformation Online

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Abstract. Research in the area of misinformation online has identified various factors as the reason why people spread misinformation online such as availability of technology, entertainment, ignorance, to pass time, altruism etc. However, how these factors differ from one age group to another is not known. Research also suggests that people of different generations or age groups behave differently and are influenced differently. While people of each age range will have differences among them, they will likely behave similarly compared to people of other age groups. Therefore, in determining why people spread misinformation online, it is important to investigate any differences based on the age groups of online users. This will ensure that interventions designed to curb the spread of misinformation can be tailored to people based on their age. To contribute to research in the area of determining why people of different age ranges spread misinformation online, we surveyed 113 social media users of varying age groups. Our results show that the younger participants between 18 and 34 years are more likely to spread misinformation due to the availability of technology, entertainment, the need to pass time, the fear of missing out, peer pressure and trust in people online.

Keywords: Misinformation, Social Media, Online, Age, Demographics, Generation, Tailoring, Personalization.

1. Introduction

The number of social media users has steadily increased over the last few years with studies projecting steady growth over the next ten years¹. Social media or social networking sites are often referred to as platforms that encourage communication between users and non-users in the form of user-generated content (Dijck & Poell, 2017). Examples include “non-traditional” social media platforms such as the comment section of e-commerce platforms and news sites. Social networking sites are a part of our daily lives and a lot of information is generated, consumed and shared there daily. Nowadays, social networking sites are accessed for decisions such as what hotel to stay at, (yelp.com), what recipes to try out (allrecipes.com), what products to buy (Amazon.com reviews), and answers to specific computer science questions (stackoverflow.com). Social networking sites are also used to describe experiences with a product or service. In addition, social media sites are a source of advice and recommendations in the form of comments on posts. This makes social media a rich source of information for service providers to get feedback about their products or services. Therefore, any misinformation presented on social media can have very damaging effects on users if it is consumed and spread. Misinformation is information that is wrong or misleading that is presented as a fact irrespective of if the intent is to deceive people (Dijck & Poell, 2017). Health misinformation can lead to public health issues such as undermining the uptake of vaccines or non-compliance with public health guidelines (van der Linden, 2022). Misinformation about a business can have financial consequences on the business (Petratos, 2021). Misinformation can affect one’s credibility (Zhang et al., 2018) can lead to violence against them (Banaji et al., 2019) and can lead to cyberbullying (Beheshti & Large, 2013). Thus, it is important to understand why misinformation is spread to curb its spread.

Various factors have been identified as being responsible for the spread of misinformation. These include the availability of technology (V Balakrishnan et al., 2021), for entertainment (Islam et al., 2020), ignorance (Froehlich, 2017), (V Balakrishnan et al., 2021), to pass time (Apuke & Omar, 2021), altruism (Hiaeshutter-Rice et al., 2021), the fear of missing out (Ebardo et al., 2020), peer pressure (Ebardo et al., 2020), and trust of online people (Cheng & Chen, 2021). However, the differences in the effect of these factors among people of various age groups are unclear. Not everyone who uses social media is within the same age range. Research suggests that while most social media users are between 18 and 29 years, people of other age groups actively use social media too (Pew Research, 2021). Research also indicates that there has been a steady increase in the use of social media in all age groups (Pew Research, 2021). Since social media is being used by people of different ages, and because people of different age groups/ranges are influenced differently (Adaji & Vassileva, 2017), it is important to investigate if the factors that influence the spread of misinformation are different for people of different age groups. This will ensure that any interventions developed to curb the spread of misinformation are effectively tailored to groups of similar individuals.

¹ <https://www.pewresearch.org/internet/fact-sheet/social-media/>

To contribute to research in this area, we investigated the factors that influence people to share misinformation online and explored differences between various age groups. In particular, we aim to answer the research question:

RQ: Are there any significant differences in the factors that motivate the spread of misinformation online for different age groups?

To answer this research question, we explored the factors: *availability of technology, entertainment, ignorance, to pass time, altruism, the fear of missing out, peer pressure, and trust of online people/sources* in 113 people of different age groups. Our results suggest that compared to older social media users, younger social media users between the ages of 18 and 34 were more likely to spread misinformation because of the availability of technology, entertainment, to pass time, for the fear of missing out, because of peer pressure and because they trust online sources.

This study contributes to the area of user modelling and personalization by identifying the behaviour of different age groups regarding the spread of misinformation. This information can be used to develop personalized interventions to curb the spread of misinformation. For example, our results indicate that compared to older users, younger social media users will likely spread misinformation to pass time. Interventions in the form of notifications to read an e-book or use an app to learn a new language can be suggested to younger social media users after they have been online for a certain period so they can pass time using other means instead of spreading misinformation.

2. Related Work

The study of the spread of misinformation online is an active research area, particularly over the last two years. Since people rely on online information for many decisions, it has become a very important research area. Different studies have been carried out to understand the spread of misinformation in various sectors. Petratos (Petratos, 2021) investigated the consequences of misleading information on businesses and analyzed various misleading information types and their associated risks to businesses. The author also investigated the impact of misleading information in the healthcare sector, media, financial markets and elections. Zhang et al. (Zhang et al., 2018) studied the detection and response to misinformation in news articles. They developed indicators for article credibility from within an article's text and from external sources or an article's metadata.

Several researchers have explored the factors that motivate people to spread misinformation online. Metzger et al. (Metzger et al., 2021) concluded that factors such as entertainment, sarcasm and education influence people to share misinformation. Ebarido et al. (Ebarido et al., 2020) identified peer pressure and the fear of missing out as factors that motivate the spread of misinformation online. Balakrishnan et al. (V Balakrishnan et al., 2021) identified six factors: the availability of technology, a form of entertainment, ignorance, to pass time, altruism, and the fear of missing out. We adopted these factors in this study because they were identified using various social and psychological models and theories including the Socio-Cultural Psychological Technology model (Vimala Balakrishnan, 2017), the Uses and Gratification theory (Palmgreen & Rayburn, 1978), and the Self-Determination theory (Deci & Ryan, 2012). In addition, these factors overlap with those identified by other researchers (Ebarido et al., 2020), (Metzger et al., 2021). In addition to these six factors, in this study, we investigated peer pressure and trust of people online because these factors have been identified as common factors that influence people to spread misinformation online (Ebarido et al., 2020).

To the best of our knowledge, no one has explored how these factors differ among people of different age groups. Research suggests that people of various age groups behave differently and thus are motivated differently (Orji et al., 2015). For example, research suggests that older generations use social media less than younger generations (Auxier & Anderson, 2021) and that older adults for whom social media is their main source of information have lower social trust in information (Chun Wong et al., 2021). In addition, research suggests that younger adults have a higher fear of missing out compared to older adults (Rozgonjuk et al., 2021). Furthermore, research indicates that the frequency of use of social media decreases with age (Auxier & Anderson, 2021). All these are indicators that the motivating factors to spread misinformation could be different for people of different age groups. Therefore, it is important to understand how age differences impact how people are motivated to spread misinformation online. This will ensure that interventions to curb the spread of misinformation are effectively tailored to various age groups to increase their efficacy.

3. Research Methodology

To determine why people of different ages spread misinformation online, we surveyed social media users. We adopted the previously validated scale of Balakrishnan et al. (V Balakrishnan et al., 2021) which measures the constructs *availability*, *entertainment*, *ignorance*, *passing time*, *altruism*, and *fear of missing out*. All items were measured on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). Peer pressure was measured using the scale of (Santor et al., 2000) while trust of people online was measured using the scale of (Przemysław & Strzelecki, 2022).

We recruited participants to complete the study from Amazon's Mechanical Turk (MT). MT allows one to recruit a diverse set of participants and is an accepted method of recruiting participants (Buhrmester et al., 2015). We had 117 responses, however, only 113 participants completed the survey, thus four responses were excluded. Table 1 shows the demographics of the participants. Overall, most participants were between 35 and 44 years old. Of all the social media platforms listed, most participants reported using Facebook and reported being college graduates. The study was approved by the Research Ethics Board of our university.

For all items, we computed the mean response of participants for each factor. To compare responses by participants based on their ages, we grouped participants into four age groups as shown in Table 1 based on the ages of the respondents. We then carried out a one-way ANOVA to determine if there are significant differences between the age groups for each of the factors we are measuring: availability/effort, entertainment, ignorance, passing time, altruism, and fear of missing out. One-way ANOVA can be used to measure to determine if there are differences between independent groups and where any differences lie (Laerd, 2015). In our study, the age groups are independent since no one can belong to more than one age group. To determine where the significant differences were between the age groups, we carried out a Tukey's Honest Significant Difference (HSD) post hoc test. We did not carry out a Structural Equation Modeling (SEM) because we are still collecting data and the results of a SEM will likely change when the data points increase significantly. We plan to do this in the future after the final data collection.

Table 1. Demographics of participants

Demographics	Value	Frequency
Age ranges	18-34	26%
	35-44	41%
	45-54	12%
	55-74	22%

4. Results

As shown in Figure 1, *altruism* had the highest mean while fear of missing out (FOMO) and altruism had the lowest mean scores.

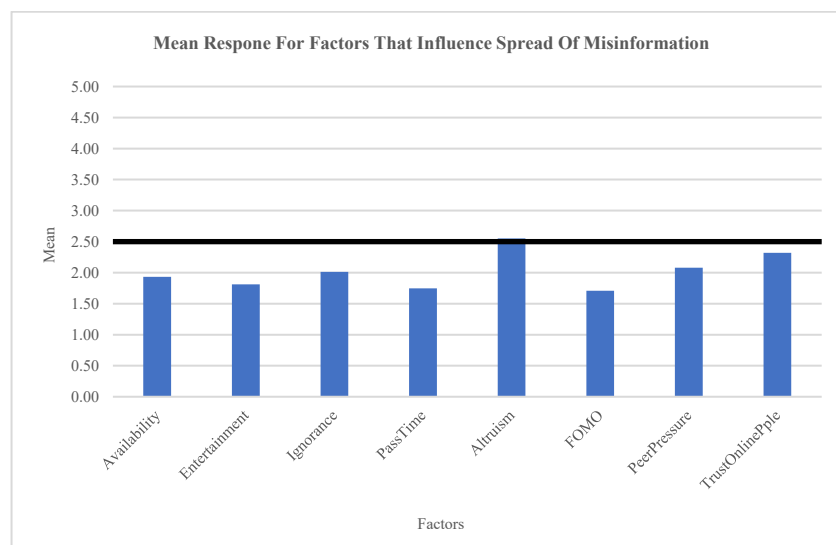
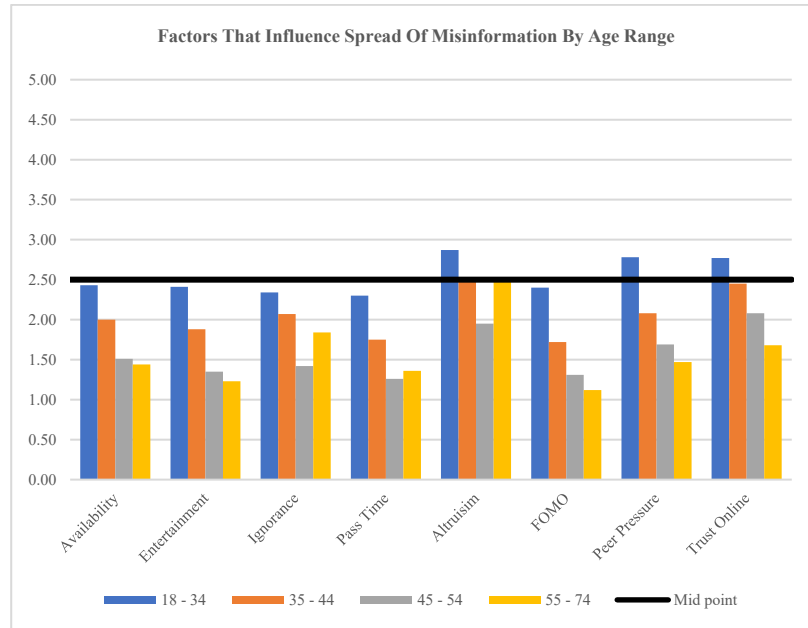


Figure. 1. Mean of factors

Figure 2 shows the eight factors for the four age groups. Altruism had the highest average for all age groups except for participants between 45 -54 years. This group scored highest in online trust.

**Figure. 2. Mean of factors grouped by age of participants.**

We carried out a one-way ANOVA to identify significant differences between the age groups for each of the factors. The results are presented in the following sections and are summarized in Table 2.

4.1 Availability of Technology

The *availability of technology* as a reason for spreading misinformation was statistically significantly different between age groups, $F(3, 109) = 3.44$, $p \approx 0.019$. A Tukey post-hoc test revealed that the availability of technology was significantly different ($p \approx 0.021$) between people of age groups 55 – 74 years (mean = 1.44) and those in the age range 18 – 34 years (mean = 2.43). There were no significant differences between other age groups. This suggests that on average, participants within the age range 55 – 74 years were significantly less likely to spread misinformation due to the availability of technology compared to those within the age range 18 – 34 years.

4.2 Entertainment

The result of the one-way ANOVA showed that *entertainment* was statistically significantly different between some age groups, $F(3, 109) = 6.55$, $p \approx 0.00041$. A Tukey post-hoc test revealed that the entertainment was significantly different ($p \approx 0.016$) between people of age groups 45 – 54 years (mean = 1.35) and those in the age range 18 – 34 years (mean = 2.41). There was also a statistically significant difference ($p \approx 0.00046$) between age groups 55 – 74 years (mean = 1.23) and 18 – 34 years (mean = 2.41). There were no significant differences between other age groups. This suggests that on average, participants within the age ranges 45 – 54 years and 55 – 74 years were significantly less likely to spread misinformation as a form of entertainment compared to those within the age range 18 – 34 years.

4.3 Ignorance

There were no statistically significant differences between age groups $F(3, 109) = 2.05$, $p \approx 0.11$ with ignorance as a reason for spreading misinformation. Thus, no Tukey post-hoc test was performed.

4.4 Pass Time

A one-way ANOVA indicated that there were significant differences $F(3, 109) = 4.15$, $p \approx 0.00795$ among the different age groups regarding *passing time* as a reason for the spread of misinformation. A Tukey post-hoc test indicated that there was a significant difference ($p \approx 0.032$) between age groups 45 – 54 years (mean = 1.26) and

18 – 34 years (mean = 2.30). There was also a significant difference ($p \approx 0.014$) between the age groups 55 – 74 years (mean = 1.36) and 18 – 34 years (mean = 2.30). This suggests that people in age groups 45 – 54 years and 55 – 74 years are significantly less likely to spread misinformation just to pass time compared to those in the age group 18 – 34 years.

4.5 Altruism

There were no statistically significant differences between age groups $F(3, 109) = 1.35$, $p \approx 0.26$ with altruism as a reason for spreading misinformation. We, therefore, did not conduct a Tukey post-hoc test.

4.6 Fear of Missing Out

Regarding the fear of missing out as a reason for the spread of misinformation, there were significant differences among the different age groups as indicated by a one-way ANOVA $F(3, 109) = 6.57$, $p \approx 0.0004$. These differences as indicated by a Tukey post-hoc test ($p \approx 0.022$) were between the age groups 45 – 54 years (mean = 1.31) and 18 – 34 years (mean = 2.38). There was also a significant difference ($p \approx 0.0003$) between the age groups 55 – 74 years (mean = 1.12) and 18 – 34 years. This suggests that people in age groups 45 – 54 years and 55 – 74 years are less likely to spread misinformation because of the fear of missing out compared to those between the ages of 18 – 34 years.

4.7 Peer Pressure

Peer pressure as a reason to spread misinformation was also statistically significant between age groups $F(3, 109) = 6.93$, $p \approx 0.000258$. A Tukey post-hoc test indicated that the differences were between people in three age groups. There was a significant difference ($p \approx 0.043$) between people of age groups 35 – 44 years (mean = 2.08) and 18 – 34 years (mean = 2.78), and also between 45 – 54 years (mean = 1.69) and those in the age range 18 – 34 years ($p \approx 0.02$). Furthermore, there was a significant difference ($p \approx 0.0002$) between age groups 55 – 74 years (mean = 1.47) and 18 – 34 years. There were no significant differences between other age groups. This suggests that people between the ages of 35 and 74 were less likely to spread misinformation because of the fear of missing out compared to those between 18 and 34 years.

4.8 Trust Online

A one-way ANOVA indicated that trust in people online as a reason for spreading misinformation was statistically significantly different between some age groups $F(3, 109) = 6.93$, $p \approx 0.00841$. A post-hoc test revealed that there was a significant difference ($p \approx 0.0063$) between age groups 55 – 74 years (mean = 1.68) and 18 – 34 years (mean = 2.77), and also between 55 – 74 years and those in the age range 35 – 44 (mean = 2.45).

Table 2. Summary of age groups with significant differences between them

Factors	Between Age groups	P-values
Availability of Technology	55 – 74 and 18 – 34	0.0214513
Entertainment	45 – 54 and 18 – 34	0.0162626
	55 – 74 and 18 – 34	0.0004601
Ignorance	None	
Pass time	45 – 54 and 18 – 34	0.0320460
	55 – 74 and 18 – 34	0.0144472
Altruism	None	
Fear of missing out	45 – 54 and 18 – 34	0.0216566
	55 – 74 and 18 – 34	0.0003159
Peer pressure	35 – 44 and 18 – 34	0.0431741
	45 – 54 and 18 – 34	0.0206604
	55 – 74 and 18 – 34	0.0001857

Trust online	55 – 74 and 18 – 34	0.0063019
	55 – 74 and 35 – 44	0.0531188

5. Discussion

As shown in our results, for most of the factors, there were significant differences in age groups, particularly between the youngest age group, 18 to 34 years and the oldest age group, 55 to 74 years, and also between the youngest age group 18 to 34 years and between 45 to 54 years, with older adults being less likely to be influenced by the factors compared to younger adults. These results are in line with existing research that suggests that older adults are less likely susceptible to social influence than younger adults (Foulkes et al., 2018). All but one of the eight factors we investigated are social influence factors, thus it is not surprising that the behaviours of older adults and younger adults will differ significantly. Our results are also in line with existing research that suggests that compared to older people, younger ones have a higher fear of missing out (Rozgonjuk et al., 2021). Thus, it is not surprising that our results indicate that younger adults are more likely to spread misinformation because of the fear of missing out compared to older adults. In addition, our results also support existing research that suggests that older generations use social media less than younger generations (Auxier & Anderson, 2021) and that older adults for whom social media is their main source of information have lower social trust in information (Chun Wong et al., 2021). This makes it unlikely that the older generation will spread misinformation online due to trust in people.

The non-social influence factor, availability of technology, also differed significantly between older participants (55 – 74 years) and younger ones (18 – 34 years) with the younger participants being more likely to spread misinformation due to the availability of technology. This result is also not surprising since research (Czaja et al., 2006) suggests that older adults are less likely to use technology compared to younger adults. Therefore, it is unlikely that older adults will be more inclined to spread misinformation because of the availability of technology compared to younger adults.

In addition to the questions on the eight factors, we also asked participants the open-ended question: *What do you think the government can do to prevent or stop the spread of misinformation online?* As shown in Figure 3, our results indicate that about 44% of participants aged 55 to 74 years said the government can do nothing to prevent the spread of misinformation.

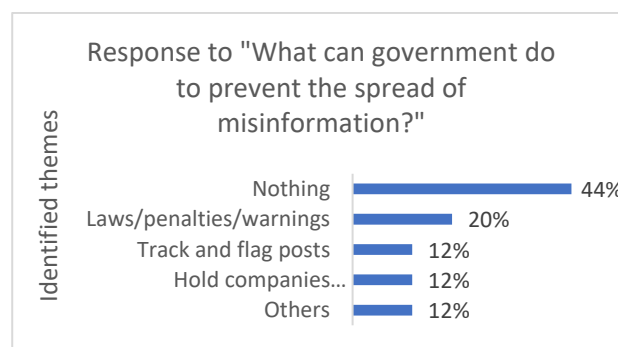


Fig. 3. Older participants, 55 – 74 years.

On the other hand, as shown in Figure 4, 42% of the younger population aged 18 to 34 years said the government can come up with laws, penalties or some form of warnings/sanctions against people who spread misinformation.

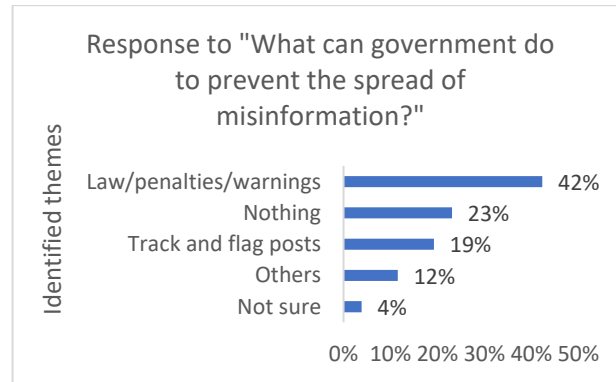


Fig. 4. Younger participants, 18 – 34 years.

These results show how people of different age groups differ about topics such as the spread of misinformation online. This suggests that when interventions are being developed to curb the spread of misinformation, these interventions should be tailored to people based on their age groups to result in a higher efficacy of such interventions. This is in line with ongoing research that suggests that when tailored to individuals or groups of similar individuals using factors such as age, interventions such as persuasive technologies are more effective in bringing about a change in behaviour or attitude (Orji et al., 2015).

Our study has some limitations. First, the number of participants that took part in our study is limited. The recruitment of participants is still ongoing. In the future, we plan to repeat the study when we have a substantially high number of participants. We are however confident that our results will be similar to those presented here because of existing research that supports our findings. A second limitation is that we did not have an equal number of participants in each age group. We are making efforts to ensure that we have similar numbers of people as we continue to recruit more participants.

We are still collecting data. In the future, we will repeat the study with more participants. In addition to repeating this study, we will look at the effects of differences in the demographics of our participants. For example, we will investigate any differences in our results based on gender, level of education, frequency of social media use and type of social media frequently used. These can guide in the development of personalized interventions to curb the spread and consumption of misinformation.

6. Conclusion

Several factors such as the availability of technology, entertainment, ignorance, need to pass time, altruism, peer pressure, trust in people online, and fear of missing out have been identified as being responsible for the spread of misinformation online. Because people of different age groups behave differently, it is important to study how these factors differ from one age group to another. Therefore, in determining why people spread misinformation online, it is important to investigate any differences in these factors based on the age groups of online users. This is important to determine how interventions designed to curb the spread of misinformation can be tailored to online users. To contribute to research in this area, we present the preliminary results of a study of 113 social media users of different age groups where we investigate differences in these factors between the different age groups. Our results indicate that the younger generation aged between 18 – 34 years are more likely to spread misinformation due to the availability of technology, entertainment, the need to pass time, the fear of missing out, peer pressure and trust in people online. We are still in the process of collecting data. In the future, we plan to repeat this study on a larger scale.

References

- Adaji, I., & Vassileva, J. (2017). The Impact of Age, Gender and Level of Education on the Persuasiveness of Influence Strategies in E-commerce. *Adjunct Proceedings of the 12th International Conference on Persuasive Technology, April 2017*, 10.
- Apuke, O. D., & Omar, B. (2021). Fake news and COVID-19: modelling the predictors of fake news sharing among social media users. *Telematics and Informatics*, 56, 101475. <https://doi.org/10.1016/J.TELE.2020.101475>
- Auxier, B., & Anderson, M. (2021). Social media use in 2021. In *pewresearch.org* (Vol. 7).
- Balakrishnan, V, Kee, K., & Rahim, H. (2021). To share or not to share—The underlying motives of sharing fake news amidst the COVID-19 pandemic in Malaysia. *Technology in Society*, 66, 101676.

- Balakrishnan, Vimala. (2017). Unraveling the underlying factors SCulPT-ing cyberbullying behaviours among Malaysian young adults. *Computers in Human Behavior*, 75, 194–205. <https://doi.org/10.1016/J.CHB.2017.04.062>
- Banaji, S., Ramnath, B., Agarwal, A., Nihal, P., & Pravin, M. S. (2019). *WhatsApp vigilantes: An exploration of citizen reception and circulation of WhatsApp misinformation linked to mob violence in India*.
- Beheshti, J., & Large, A. (2013). *The information behavior of a new generation: Children and teens in the 21st century*. The Scarecrow Press Inc.
- Buhrmester, M., Kwang, T., & Gosling, S. D. (2015). Amazon's Mechanical Turk: A new source of inexpensive, yet high-quality data? *Methodological Issues and Strategies in Clinical Research (4th Ed.)*, 133–139. <https://doi.org/10.1037/14805-009>
- Cheng, Y., & Chen, Z. F. (2021). Encountering misinformation online: antecedents of trust and distrust and their impact on the intensity of Facebook use. *Online Information Review*, 45(2), 372–388. <https://doi.org/10.1108/OIR-04-2020-0130/FULL/HTML>
- Chun Wong, F. H., Liu, T., Yi Leung, D. K., Zhang, A. Y., Hong Au, W. S., Kwok, W. W., Shum, A. K. Y., Yan Wong, G. H., & Lum, T. Y. S. (2021). Consuming Information Related to COVID-19 on Social Media Among Older Adults and Its Association With Anxiety, Social Trust in Information, and COVID-Safe Behaviors: Cross-sectional Telephone Survey. *Journal of Medical Internet Research*, 23(2). <https://doi.org/10.2196/26570>
- Czaja, S. J., Charness, N., Fisk, A. D., Hertzog, C., Nair, S. N., Rogers, W. A., & Sharit, J. (2006). Factors Predicting the Use of Technology: Findings From the Center for Research and Education on Aging and Technology Enhancement (CREATE). *Psychology and Aging*, 21(2), 333. <https://doi.org/10.1037/0882-7974.21.2.333>
- Deci, E. L., & Ryan, R. M. (2012). Self-determination theory. *Handbook of Theories of Social Psychology*, Vol. 1, 416–436. <https://doi.org/10.4135/9781446249215.n21>
- Dijck, J. Van, & Poell, T. (2017). Social media platforms and education. In *The SAGE Handbook of Social Media*, 579–591.
- Ebardo, R., De La Cuesta, J., Catedrilla Jypzie, & Wibowo, S. (2020). Peer Influence, Risk Propensity and Fear of Missing Out in Sharing Misinformation on Social Media during the COVID-19 Pandemic. *Proceedings of the 28th International Conference on Computers in Education*.
- Foulkes, L., Leung, J., & Fuhrmann, D. (2018). Age differences in the prosocial influence effect. *Developmental Science*, 21(6). <https://doi.org/10.1111/desc.12666>
- Froehlich, T. J. (2017). A Not-So-Brief Account of Current Information Ethics: The Ethics of Ignorance, Missing Information, Misinformation, Disinformation and Other Forms of Deception. *BiD*, 39.
- Hiaeshutter-Rice, D., Chinn, S., & Chen, K. (2021). Platform Effects on Alternative Influencer Content: Understanding How Audiences and Channels Shape Misinformation Online. *Frontiers in Political Science*, 3, 53. <https://doi.org/10.3389/FPOS.2021.642394/BIBTEX>
- Islam, A. K. M. N., Laato, S., Talukder, S., & Sutinen, E. (2020). Misinformation sharing and social media fatigue during COVID-19: An affordance and cognitive load perspective. *Technological Forecasting and Social Change*, 159(120201). <https://doi.org/10.1016/J.TECHFORE.2020.120201>
- Laerd. (2015). *One-way ANOVA using SPSS Statistics. "Statistical tutorials and software guides*.
- Metzger, M. J., Flanagin, A. J., Mena, P., Jiang, S., & Wilson, C. (2021). From dark to light: The many shades of sharing misinformation online. *Media and Communication*, 9(1), 134–143. <https://doi.org/10.17645/mac.v9i1.3409>
- Orji, R., Mandryk, R., & Vassileva, J. (2015). Gender, age, and responsiveness to Cialdini's persuasion strategies. *Proceedings of International Conference on Persuasive Technology*, 147–159.
- Palmgreen, P., & Rayburn, J. D. (1978). *Uses and Gratifications and Exposure to Public Television: A Discrepancy Approach*.
- Petratos, P. N. (2021). Misinformation, disinformation, and fake news: Cyber risks to business. *Business Horizons*, 64(6), 763–774. <https://doi.org/10.1016/J.BUSHOR.2021.07.012>
- Pew Research. (2021). *Social Media Fact Sheet*.
- Przemysław, M., & Strzelecki, A. (2022). Trust, Media Credibility, Social Ties, and the Intention to Share towards Information Verification in an Age of Fake News. *Behavioral Sciences*, 12(2), 51. <https://doi.org/10.3390/bs12020051>
- Rozgonjuk, D., Sindermann, C., Elhai, J. D., & Montag, C. (2021). Individual differences in Fear of Missing Out (FoMO): Age, gender, and the Big Five personality trait domains, facets, and items. *Personality and Individual Differences*, 171, 110546. <https://doi.org/10.1016/J.PAID.2020.110546>
- Santor, D. A., Messervey, D., & Kusumakar, V. (2000). Measuring peer pressure, popularity, and conformity in adolescent boys and girls: Predicting school performance, sexual attitudes, and substance abuse. *Journal of Youth and Adolescence*, 29(2), 163–182. <https://doi.org/10.1023/A:1005152515264>
- van der Linden, S. (2022). Misinformation: susceptibility, spread, and interventions to immunize the public. *Nature Medicine*, 28(3), 460–467. <https://doi.org/10.1038/s41591-022-01713-6>
- Zhang, A. X., Ranganathan, A., Metz, S. E., Appling, S., Sehat, C. M., Gilmore, N., Adams, N. B., Vincent, E., Lee, J. 8, Robbins, M., Bice, E., Hawke, S., Karger, D., Mina, A. X., Sehat, C.-N. M., & Lee, J.-N. (2018). A Structured Response to Misinformation: Defining and Annotating Credibility Indicators in News Articles. *International World Wide Web Conference*, 10. <https://doi.org/10.1145/3184558.3188731>

Maximising Social Media Platforms to Enhance Sexuality Education in Rural Schools

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Abstract: Sexuality education is central to the South African government's strategy to promote adolescents' sexual and reproductive health, reduce student pregnancy, and prevent sexually transmitted infections, including HIV. The school-based sexuality education program aims to reduce young people's vulnerability, enhance their decision-making skills, and improve their self-efficacy. The rising incidence of sexually transmitted infections and student pregnancy in some rural schools in King Cetshwayo district may indicate that their sexuality education programs are ineffective as a result of multiple contextual factors. In light of this, the author conducted a study that explored students' lived experiences with the sexuality education programs available in their schools. This phenomenological study was conducted in 2020. Nine schools were chosen, and 84 purposively sampled secondary school students participated in focus group interviews. The collected data were analysed using an interpretative phenomenological analysis framework. Study findings revealed that social media platforms could be utilised to improve the effectiveness of school-based sexuality education in the research setting. The study identified untapped opportunities to spread sexuality education messages to all stakeholders, including students, teachers, parents, and various community actors. Furthermore, the findings showed that using social media platforms could increase the spread and accessibility of sexuality education messages outside of the four walls of classrooms. In addition, it emerged that social media could be used to create platforms for confidential, private, and non-judgemental engagements on sensitive aspects of sexuality education. Based on the findings of the study, the author recommends that policymakers initiate and implement policies that will integrate the use of multiple social media platforms to advance the messages of sexuality education to all stakeholders. In addition, such platforms could be used for capacity building and support for both teachers and students, as well as a medium for multi-stakeholder engagement.

Keywords: Social Media, Sexuality Education, Sexual And Reproductive Health, Students, Teachers, South Africa.

1. Introduction

A high-quality sexuality education program provides young people with the knowledge and skills they need to make health-promoting decisions and protect themselves from sexually transmitted infections (STI) including HIV. However, misconceptions, a culture of silence, and contradictory messages have been identified as factors limiting the effectiveness of school-based sexuality education on students' sexual and reproductive health (SRH) outcomes in South Africa (Adekola & Mavhandu-Mudzusi, 2021). To maximize the impact of a sexuality education program on adolescents' SRH, it is necessary to communicate scientifically accurate messages about sexuality education to students and other key stakeholders. This can be done by harnessing every available resource and platform to increase access to sexual health-promoting information.

Korda and Itani (2011) indicated that social media provide a huge opportunity to share health-promoting information. The authors defined social media as participatory, rapid, and innovative internet communication platforms. As a result, social media, due to its interactive and engaging nature, could be used to disseminate health education messages to many people, regardless of their demographic attributes. Examples of social media platforms include but are not limited to Facebook, Twitter, WhatsApp, Instagram, YouTube, Telegram, WeChat, TikTok, and so on. According to Stellefson, Paige, Chaney, and Chaney (2020), more people are inclined to use social media platforms because they eliminate physical barriers that previously hampered access to health-related information and resources. The authors further maintain that social media is increasingly being used because it allows for actionable, interactive, and impactful engagement on a variety of health issues for various population groups. For certain population groups, such as at-risk or minority groups, social media provides access to online health information resources that would otherwise be difficult to accessed using a conventional or traditional approach (Jane, Hagger, Foster, Ho, & Pal, 2018).

As of 2021, Social media platforms are used by approximately 4.26 billion people worldwide for a variety of purposes such as networking, advertising, information dissemination, community building, and so on (Statistica, 2022). Social media is a veritable and cost-effective tool for health promotion advocacy, information dissemination, collaboration, and engagement with a larger audience. While the use of social media has increased over the years, Uittenhout (2012) stated that social media may be ineffective if the targeted audience does not have access to internet resources or is not adequately mobilized about its use through awareness. This is consistent with the findings of Stellefson et al. (2020), who found that using social media among people who

are not technologically literate or inclined may be ineffective, particularly for population subgroups such as the elderly, those who are physically and cognitively challenged, and those who are not text, technical, or eHealth literate. Furthermore, the widespread use of social media on cellphones and other digital devices could be used to galvanize social support for health education and promotion. In some cases, a lack of internet access may be a barrier to leveraging the use of social media.

Besides providing access to information for target population groups, Hudnut-Beumler, Po'e, and Barkin (2016) explain that social media could serve as an accessible virtual venue for health intervention programs. However, Korda and Itani (2011) caution that despite the enormous potential of social media to promote health messages and education, it requires skillful, careful, and innovative application, and the intended outcomes sometimes may not be achieved. Stellefson et al. (2020) agree, citing misinformation and noncompliance with user privacy protections as potential challenges and complications associated with social media use. The literature review showed that there is a dearth of qualitative studies on how social media can be utilized to enhance school-based sexuality education in the research setting. Therefore, with the increased negative SRH outcomes such as teenage pregnancies and STIs among the students in rural areas of the King Cetshwayo district in South Africa (Office of the Premier, KwaZulu-Natal, 2020), this study explored the students' experiences with sexuality education being implemented in their schools and what possible interventions could enhance its effectiveness.

2. Methodology

2.1 Design

Guided by Polit and Beck (2017), this study used an interpretative phenomenological design to investigate students' lived experiences with the sexuality education that their schools offered. This design allows researchers to gain deep insights into the participants' shared experiences and the contexts in which they had those experiences. Participants' self-described experiences were obtained through focus group interviews. All sessions of the interview were audio recorded.

2.2 Setting

The study took place in rural schools in the King Cetshwayo district of the KwaZulu-Natal province, South Africa. The schools chosen for the study offer a sexuality education program as part of their life orientation curriculum. In addition, the schools in the research setting have a high prevalence of teenage pregnancy among the students.

2.3 Sampling

Participants were purposively sampled from the selected schools in the research setting. The participants in this study met the following inclusion criteria: they were aged between 14 and 19 years, resided in the research setting, were fluent speakers of either or both English and isiZulu, were enrolled as Grade 10 or Grade 11 learners, accepted to be audio recorded, and signed an informed assent as well as obtained parental consent to take part in the study.

2.4 Data Collection

Data collection took place between March and July 2020. Data for this study was obtained using focus group interviews. The interview guide developed by the researcher was refined in a pilot study before the actual data collection took place. Each interview session lasted for about two hours and was mediated by the researcher. The researcher used Kvale's (1996) interview guidelines, as cited by Adekola and Mavhandu-Mudzusi (2021), during data collection, asking open-ended questions such as, "From your experience as a learner in this school, how can the effectiveness of the sexuality education program in your school be improved?" The central question was followed with probes, prompts and clarifying questions to obtain rich information from the students' shared experiences.

COVID-19 safety protocols were strictly adhered to during the data collection sessions due to the COVID-19 pandemic during data collection. Also, as a result of the participants wearing facemasks, a high-quality audio recorder was used for data collection. Field notes were also used to capture the researcher's observations, thoughts, and participants' non-verbal expressions during the interviews. The collected data was analysed iteratively until saturation was reached.

2.5 Data Analysis

Within two days, the collected audio data from each interview was transcribed verbatim into written text. The interpretative phenomenological (IPA) analysis framework, as described by Noon (2018), guided the analysis of nine focus group interview transcripts. Furthermore, an independent coder was hired to independently analyse all the transcripts. The themes that emerged from the researcher's analysis were compared with those of the independent coder, which led to the emergence of a final table containing two main themes and several sub-themes, along with relevant quotes from the participants.

2.6 Trustworthiness

To guarantee the trustworthiness of this research, Lincoln and Guba's (1985) four criteria for trustworthiness were adopted. The criteria include credibility, confirmability, dependability, and transferability. The credibility of this study was ensured by conducting on-going member checking, where participants listened to the recorded audio to make sure their self-reported information was captured accurately. Likewise, the transcripts were made available to some participants to verify that their experiences and views were accurately reflected. The study locations, dates, and times spent in the study setting were recorded in the researcher's fieldnotes to enhance the dependability and confirmability of the study. In addition, the researcher's colleagues independently transcribed the audio-recorded data verbatim, and an independent coder was also engaged, who came up with independent thematic categories. Confirmability for this study was achieved by comparing the independently obtained thematic categories with the researcher's determined themes. Besides keeping an audit trail of all research activities, rich details and thick descriptions of participants' biographies and study context were provided to enhance transferability.

2.7 Ethical consideration

Ethical clearance was sought and received from the University of South Africa and the KwaZulu-Natal provincial Department of Basic Education to conduct the research. The nature, purpose, and possible benefits of the study were made clear to the participants by the researcher. In addition, the researcher informed the participants that their participation in the research was entirely voluntary and reiterated their right to decline and withdraw from the study at any time without penalty. To participate in the study, the students returned completed and signed informed assent forms and their parental/guardian consent letters. Furthermore, to protect the participants' identities, pseudonyms were used in the transcripts and data reporting. To guarantee the confidentiality of the participants, the group interviews were held in appropriate, comfortable, and convenient locations. When using focus group interviews, the researcher used Sim and Waterfield's (2019) strategies to address the important issue regarding the participants' anonymity. The researcher briefed the participants about the difficulties in maintaining anonymity during a focus group interview due to its public nature. The researcher outlined the importance of participants' cooperation and commitments in order to meet the ethical standards of anonymity. Thereafter, the participants were given the option to withdraw their participation if they were uncomfortable with the issues surrounding anonymity. Following that, the researcher confirmed with the participants that they understood their responsibilities regarding anonymity. Due to the prevailing COVID-19 pandemic at the time some of the group interviews were conducted, all necessary COVID-19 safety guidelines were followed. These guidelines include a 2-meter distance between the participants, the availability of alcohol-based hand sanitizers at the interview venues, mandatory facemasks, and choosing interview rooms with cross ventilation. To prevent unauthorized access, the audio-recorded interview and transcribed data were kept in a password-protected electronic folder.

3. Results

The study findings described the biographical details of the participants. Furthermore, it revealed the use of social media platforms as a possible intervention to enhance the effectiveness of the school-based sexuality education program in the study setting.

3.1 Participants Biographical details

The study participants were made up of 35 boys and 49 girls from nine schools. The study sample size was informed by data saturation. According to Saunders, Sim, Kingstone, Baker, Waterfield, Bartlam, Burroughs, and Jinks (2018), "data saturation" occurs when new information collected from participants is a repetition of what was previously obtained from other participants. As a result, data analysis cannot yield new thematic categories

and ideas. Approximately 60% of the participants (49 students) engaged in sexual activities previously, with many of the sexually active participants having had more than one sexual partner in the previous three years. The vast majority of sexually active participants (41 students) reported they used condoms, while the remaining eight students claimed they occasionally used condoms. Four of the girls reported to have been pregnant before, while only a quarter of the participants claimed to have had no previous exposure to alcohol at the time of the focus group interview.

Apart from the biographic details of the participants, the study findings revealed the potential enhancing benefits of social media platforms in sexuality education and the possible challenges to the utilization of social media for sexuality education.

3.2 Potential benefits of social media platforms in sexuality education

Participants mentioned various ways social media platforms could enhance the impact of sexuality education on their SRH outcomes. These include access to SRH information, mitigation of the culture of silence, SRH care and support services, multi-stakeholder engagement, as well as privacy, confidentiality, and convenience.

3.2.1 Access to SRH information

Participants suggested that the sexuality education messages could be disseminated through social media platforms by their schools and department of education. This, they reasoned, would make the contents of sexuality education available to learners at any time of day via their mobile devices. In addition, such access could reinforce the sexuality education information learned in the classroom.

“It is difficult to remember everything in the class. Many of us have phones so maybe a WhatsApp group can be created so we can continue the discussion at home.” (Asande, female, 17 years old)

“We should be able to learn these things about sexuality on internet at any time. I think it will help us because we don’t have enough time in school to learn about this. Yeah, social media can help us” (Nompilo, female, 18 years old)

3.2.2 Mitigation of the culture of silence

The findings revealed that discussing sexual-related topics is frowned upon in the study setting. As a result, there is a culture of silence on sexuality-related issues, which prevents students from discussing them with their parents, guardians, religious leaders, and, in some cases, educators. Participants believed that social media could be exciting and engaging platforms for promoting discussion on a variety of sexuality education topics that had previously been considered taboo in their communities.

“My family avoid talking about sex with me. They just warned me not to do it. We don’t talk about sex in our church either. It is uncomfortable to talk about what we learnt in LO (Life Orientation) with my parents. Government can create ‘websites’ for students to talk about sexuality with experts because our teachers wouldn’t go into the details for us too. It’s like they are scared of talking (about) sex with us. Social media may help us if government do it.” (Kwanda, male, 18 years old)

3.2.3 Privacy, confidentiality, and convenience

Another benefit of using social media platforms for sexuality education is that students can conveniently access sexuality education messages while maintaining their privacy and confidentiality. Participants believed that this would allow them to access and interact with sexuality education messages without being judged or labelled as immoral.

“Most of us are not comfortable talking about sex in LO classes because some students will tease you or joke about you. Some teachers also will judge you and treat you like you don’t have morals if you talk about sex too much. With social media, I can talk about these things without using my real names and no one will judge me.” (Mthokhosizi, male, 17 years old)

3.2.4 Access to SRH care and support services

It further emerged from the data analysis that information about SRH linkage services, such as contact information and locations of clinics that provide SRH counselling services, STI management services, screening,

voluntary male circumcision, contraceptive services, pregnancy testing and care, and safe abortion care, could be made available and accessible to students via social media platforms.

“We need information about clinics where we can get condoms and counselling from nurses. In the community, everybody knows you, and the nurses will judge you. So, we need information about other clinics where nobody knows you. To go there for help like condoms and abortion. If we see this on social media, we will not need to ask around from people that will judge you.” (Silungile, female, 17 years old)

3.2.5 Multistakeholder collaboration platforms

Participants suggested that social media platforms could provide a multidimensional collaboration, engagement, and advocacy space through which various groups of stakeholders, such as sexuality education teachers, teacher-parent engagements, and key community actors such as religious, cultural, and traditional leaders, could address contradictory messages and perceptions.

“My parents think the teachers are ‘spoiling’ us by teaching us about sexuality. They think teacher should not expose us to information like that at our age. If our teachers can form a WhatsApp group with our parents, maybe they will understand” (Mzomuhle, male, 17 years old)

3.3 Challenges to utilization of social media for sexuality education

Despite the potential benefits of social media platforms for improving school-based sexuality education programs, the findings revealed that there are potential challenges such as internet accessibility, acceptance, affordability, and content relevancy that may limit the use of social media platforms in the research setting for increased impact of sexuality education programs.

3.3.1 Internet Accessibility

The use of social media for enhancing sexuality education programs could be impeded by a lack of access to internet facilities. Due to its rural nature, some parts of the study setting do not have uninterrupted internet access. Other participants mentioned that the cost of internet data bundles is not affordable.

For me I don’t have problem with social media. But the real problem is that data (bundle) is expensive, and some areas here have poor signal (Internet coverage). (Osiphayo, female, 17 years old)

3.3.2 Acceptance

Some participants mentioned that their parents and teachers are not comfortable with social media platforms and are used to more traditional ways of disseminating information. There is a genuine concern among some participants that the use of social media platforms may not be acceptable to some key stakeholders, and this lack of acceptance represents an obstacle to harnessing the opportunities provided by social media platforms for the improvement of school-based sexuality education programs.

I think using social media will only work with us young people. Our parents are old and may not like the idea. (Fezeka, female, 16 years old)

3.3.3 Affordability

Apart from the costly data bundle, results showed that the high cost of mobile and electronic devices such as smartphones, tablets, and computers could mean that a lot of people in the study setting may not have access to social media platforms.

“Not everybody in our school has cell phones or laptop. This may not work because gadgets are very expensive.” (Phumulani, male, 17 years old)

3.3.4 Contents’ relevance

The creation of sexuality-related content that aligned with the Department of Basic Education curriculum required the use of skilled individuals capable of producing curriculum contents that will be scientifically accurate, contextually relevant, engaging, evidence-based, and of high audio-visual quality. This requires that competent personnel develop content that speaks to the young people living in the study setting. Participants

are concerned that the information available on certain social media platforms may be inaccurate or irrelevant to them.

“We need to be careful, our teachers must be involved in forming the social media because they know us and the problems we face. We cannot believe everything we see on the social media if we don’t know the person who posted it. It could be a misinformation.” (Myeni, male, 17 years old)

4. Discussion

The study's findings indicated that students find social media platforms attractive for accessing SRH information. This agrees with various studies that showed that social media provide space through which health-promoting messages could be disseminated and accessed due to the increased and popular usage of mobile digital devices (Korda & Itani, 2011; Adekola & Mavhandu-Mudzusi, 2022; UNICEF, 2019; Stellefson et al., 2020). Furthermore, the findings showed that the culture of silence, where the discussion of sexual-related matters is considered taboo, can be addressed by using social media as platforms for discussing sexuality education information. This agrees with Ragsdale, Harper, Kathuria, Bardwell, Penick, and Breazeale's (2015) findings, which report that social media can be effectively used to deliver sexuality education messages to students and, if maximised, could strengthen the impact of sexuality education among students. This is also consistent with the findings of Gabarron and Wynn (2016), who highlight the potential enhancing influence that social media use can have on the delivery of sexuality education curriculum. The results further revealed that information to access SRH care and support services could be made available and accessible through social media platforms. Participants mentioned how such access to SRH-related information could be convenient, confidential, and protect their privacy. This is in line with UNICEF's (2019) reports and Gabarron and Wynn's (2016) findings, which underscore the huge opportunities to use social media for dissemination of information regarding the contact details and locations of SRH care and support services. Jane et al. (2018) agreed, by emphasizing that through social media, people could access important online health information resources that were previously difficult to access due to contextual factors. The study highlighted the opportunities for stakeholders to engage and collaborate via social media. Such engagement and collaboration could be an inter-school collaboration between sexuality education teachers for peer and professional development, parent-teacher engagement, school-community actors' engagements, and so on. This result aligned with Decker, Berglas, and Brindis's (2015) and Fernane et al.'s (2012) findings that social media space could be used as a venue for multipurpose engagement and collaboration on sexuality education among key stakeholders.

Besides the benefits, the study revealed possible challenges to maximising the use of social media. Potential barriers to maximising the social media platform for promoting sexuality education include a poor internet network in study settings and the high cost of interment data bundles. The findings were supported by Uittenhout (2012) and Stellefson et al. (2020), who noted that a lack of internet access could be the biggest impediment to using social media for improving sexuality education. Furthermore, the authors argue that for social media use to be effective, the target audience should have internet access and be technologically inclined and literate. In the same vein, the results showed that older people who are used to traditional ways of communication may not accept or use social media for educational engagements. Coupled with the fact that mobile electronic gadgets may not be affordable to students and parents who come from low socioeconomic backgrounds, Despite the fact that information made available on social media has a wider reach and coverage, Wadham, Green, Debattista, Somerset, and Sav (2019) cautioned that the quality of the information and messages matters to ensure their accuracy, creativity, and innovation. Korda and Itani (2011), as well as Stellefson et al. (2020), concur that messages to be shared on social media should be checked to avoid misinformation and non-compliance with existing users' privacy regulations.

5. Limitation of the study

The participants were recruited using a non-probability sampling method. This sampling method may have inadvertently excluded other students who may have had different experiences and perspectives. The study relied solely on students' experiences and perspectives, omitting parental and educator perspectives and experiences. The level of anxiety among participants during the COVID-19 pandemic (some focus group interviews occurred during the pandemic) may have also affected how participants shared their experiences. The interpretation of the study's findings should be done with these limitations in mind.

6. Recommendations

To maximise the use of social media platforms for the advancement and enhancement of school-based sexuality education programs in the research setting and similar settings, the Department of Basic Education (DBE) should revise its policy regarding sexuality education pedagogy to accommodate the integration of social media platforms as important resources to achieve its curriculum outcomes. In addition, based on the results of this study, teachers should be trained or retrained on the use of social media to improve their pedagogical efficacy. Social media platforms should be used by the DBE and its schools to create awareness and foster multidimensional collaboration and engagements to promote the teaching and learning of sexuality education in the study setting and, by extension, in similar settings throughout the country. Finally, the municipal authorities should provide the needed leadership to address the identified challenges to the use of social media platforms for enhancement of sexual and reproductive health education in the research setting by collaborating with other relevant stakeholders.

7. Conclusions

The findings of this study revealed the potential benefits of social media platforms for sexuality education programs if they were well harnessed. The study further shows the challenges that may impede the effective use of social media for improving school-based sexuality education. Therefore, I argue that if the identified challenges are addressed and policies are put in place to maximise the benefits of social media use in teaching and learning about sexuality education, the messages of the sexuality education curriculum will be reinforced, become more acceptable, and become more impactful, leading to enhanced positive SRH outcomes among the students.

Acknowledgements

The author would like to thank the Kwazulu-Natal Department of Basic Education for granting permission to conduct the study in its facilities and the students who participated in the study voluntarily.

References

- Adekola, A. P., & Mavhandu-Mudzusi, A. H. (2022). Advancing sexual and reproductive health outcomes in rural schools with the use of a sexuality education enhancement model: Learners' perspectives. *Heliyon*, 8(10). <https://doi.org/10.1016/j.heliyon.2022.e11189>
- Adekola, A.P. & Mavhandu-Mudzusi, A.H. (2021). Addressing Learner-Centred Barriers to Sexuality Education in Rural Areas of South Africa: Learners' Perspectives on Promoting Sexual Health Outcomes. *Sexuality Research and Social Policy*. Retrieved from <https://doi.org/10.1007/s13178-021-00651-1>.
- Decker, MJ, Berglas, NF & Brindis, DC. (2015). A Call to Action: Developing and Strengthening New Strategies to Promote Adolescent Sexual Health. *Societies*. 5, 686-712.
- Fernane, S, Fruitman, H, Topping, T, Clarke, D, Lane, A & Secan V. (2012). Effective Health Promotion Strategies to reduce sexually transmitted infections: A rapid review. <https://www.peelregion.ca/health/resources/pdf/EffectiveHealth.pdf>
- Gabarron, E & Wynn, R. (2016). Use of social media for sexual health promotion: a scoping review, *Global Health Action*, 9:1, 32193. <https://www.tandfonline.com/doi/pdf/10.3402/gha.v9.32193?needAccess=true>
- Hudnut-Beumler J, Po'e E, & Barkin S. (2016). The Use of Social Media for Health Promotion in Hispanic Populations: A Scoping Systematic Review *JMIR Public Health Surveill* 2016;2(2):e32 doi: 10.2196/publichealth.5579
- Jane, M., Hagger, M., Foster, J., Ho, S., & Pal, S. (2018). Social Media for Health Promotion and Weight Management: A critical debate. *BMC Public Health*, 18(1). <https://doi.org/10.1186/s12889-018-5837-3>
- Korda, H., & Itani, Z. (2011). Harnessing Social Media for Health Promotion and Behavior Change. *Health Promotion Practice*. <https://doi.org/10.1177/1524839911405850>
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Sage.
- Noon, E. J. (2018). Interpretive phenomenological analysis: An appropriate methodology for educational research? *Journal of Perspectives in Applied Academic Practice*, 6(1), 75-83.
- Office of the Premier, KwaZulu-Natal province (2020). KwaZulu-Natal HIV & AIDS, STIs & TB Multi-Sectoral Response Provincial Synthesis Report. Q3 2019/20 pp.15-16
- Polit, DF & Beck, CT. (2017). *Nursing Research: Generating and Assessing Evidence for Nursing Practice*. Tenth edition. Wolters Kluwer. Philadelphia.
- Saunders, B, Sim, J, Kingstone, T, Baker, S, Waterfield, J, Bartlam, B, Burroughs, H & Jinks, C. (2018). Saturation in qualitative research: Exploring its conceptualization and operationalization. *Quality and quantity*, 2018; 52(4), 1893-1907.

- Ragsdale, K, Harper, SK, Kathuria, S, Bardwell, JH, Penick, CB & Breazeale, M. (2015). Social media to enhance sexual health education for youth: Fact Not Fiction's (re)design and launch. Case Studies in Strategic Communication. csc.uscannenberg.org/wp-content/uploads/2016/06/v4art5.pdf
- Sim, J & Waterfield, J. (2019). Focus group methodology: Some ethical challenges. *Quality & Quantity*, 53. 3003-3022.
- Statista (2022). Number of Social Network Users Worldwide from 2018 to 2027. Available online: <https://www.statista.com/statistics/278414/number-of-worldwide-social-network-users/> (accessed on 09 December 2022).
- Stellefson, M., Paige, S. R., Chaney, B. H., & Chaney, J. D. (2020). Evolving role of Social Media in Health Promotion: Updated responsibilities for Health Education Specialists. *International Journal of Environmental Research and Public Health*, 17(4), 1153. <https://doi.org/10.3390/ijerph17041153>
- Uittenhout, H. (2012). The Use And Effect Of Social Media In Health Communication About Common Head Lice (dissertation). University of Twente, Enschede. https://essay.utwente.nl/62495/1/MSc_H_Uittenhout.pdf
- United Nations Children's Fund (UNICEF). (2019). The Opportunity for Digital Sexuality Education in East Asia and the Pacific. <https://www.unicef.org/eap/media/3686/file/Digital.pdf>
- Wadham, E, Green, C, Debattista, J, Somerset, S & Sav, A. (2019). New digital media interventions for sexual health promotion among young people: a systematic review. *Sexual Health*, 2019; 16(2): 101–123.

Social Media Withdrawal: What Social Media Services and Activities Teenagers miss when they are “switched-off”?

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Abstract: Nowadays teenagers grow up with social media and various possibilities of digital communication. The offline and online lives of “digital natives” are tightly bound together and for most of them life without Internet is unthinkable. However, what happens when teenagers do not have access to modern communication facilities and to social media? Do they miss these media? What services and which activities do teenagers miss? We gathered qualitative data from teenagers after three weeks of being completely offline in frames of a long-term adventure education program. We also gathered quantitative data on teenage media use before media withdrawal. 135 teenagers ($M=14.47$, $SD=.56$, 52% female) answered our questions within four years (34 teenagers in each of these years - 2018, 2019, 2020 - and 33 teenagers in 2021). After three weeks of complete media withdrawal two thirds of teenagers reported not missing social media or missing them to a minor extent. They described social media services as stressful, disturbing, extremely time-consuming and boredom-related. Several respondents replied that they had enough communication offline and felt good in the community that made online social media superfluous. However, every third teenager reported missing social media. The main reason was the desire to contact the personal social network. A few teenagers reported missing social media as a source of relaxation and an efficient way to “switch-off”. One out of four teenagers (23%) reported missing WhatsApp. One out of ten (11%) mentioned Instagram, but just one half in a context of missing it. WhatsApp and Instagram were also the most popular services among teenagers before withdrawal (94.3% of teenagers reported having a profile in WhatsApp and 73,3% of teenagers reported using Instagram). Only a few teenagers (2.2%) - all boys - mentioned missing YouTube. The article presents further results, discusses perspectives and limitations of the project.

Keywords: Social Media Use Among Teenagers, Media Withdrawal, Whatsapp, Instagram, Youtube, Media-Related Stress, Boredom, Gender Differences In Social Media Use

1. Introduction

Now teenagers grow up with social media and various possibilities of digital communication. For representatives of the Generation Z - also named the iGeneration, the net generation, the Google generation, Homelanders or post-Millennials - the offline and online lives are tightly bound together and for most of them life without Internet and social media is unthinkable. “Social media, constant connectivity and on-demand entertainment and communication are innovations Millennials adapted to <..>. For those born after 1996, these are largely assumed” (Dimock 2019). “Digital natives” are socialized in a way that is vastly different from their parents and there are assumptions going so far to state that “Digital Natives brains are likely to be physically different as a result of the digital input they received when growing up” (Prensky 2001).

Michael Dimock from the Pew Research Centre states: “The implications of growing up in “always on” technological environment are only now coming into focus <..> Beginning to track this new generation over time will be of significant importance” (Dimock 2019). Our research is focusing on the Generation Z and aims at answering the questions: what happens when teenagers do not have an access to modern communication facilities and to social media they are used to? What services and which activities do teenagers miss when they are “switched-off”?

Up to now the reaction of users on social media abstinence has received some attention as the potential clinical intervention in case of social media addictive behaviours (Fernandez et al. 2020; Zhou et al. 2021). Internet addiction and social media overuse are hot topics, with studies scrutinizing conceptualisation, prevalence and associated factors of the phenomenon (for systematic reviews see e.g. Kuss et al. 2014 and Talis, 2022; for meta-analysis of gender-related differences see Su et al., 2020). However, treatment of this widespread and problematic phenomenon is still in its infancy stage (Gioia & Boursier, 2019; Zajac et al, 2017). Media withdrawal could potentially be used for tackling social media overuse and Internet addiction; however, its potential is still to be clarified.

Up to now studies looked at short-term abstinence interventions from several 2.5-hour breaks (Zhou et al. 2021) to one week (Stieger & Lewetz 2018). Stieger and colleagues (2018) designed an ecological momentary intervention study using smartphones where 152 participants were instructed not to use media for 7 days. A substantial number of participants (59 percent) relapsed at least once during the intervention. The researchers

concluded in their study: “Communicating through online social media is evidently such an integral part of everyday life that being without it leads to withdrawal symptoms (craving, boredom), relapses, and social pressure to get back on social media”. Hoffner and colleagues (2016) analysed the recalled responses of 272 smartphone users to loss/separation from their mobile phones (not by choice) and their use of the mobile phones for self-expansion. Most respondents reported negative feelings, such as loneliness/disconnection, anxiety, and boredom when without their mobile phones, whereas some felt relieved to be out of touch with others. Our aim in this study is to assess the reactions of teenagers after a much longer media withdrawal – three weeks without possibility to relapse.

In Germany, media use among teenagers is very high. According to “EU Kids Online 2020: Survey results from 19 countries” (Smahel et al. 2020), in Germany more than 85% of children aged 9-16 use a smartphone to access the Internet at least once a day, 46% use desktop computer, laptop or notebook, and 16% use tablet to go online daily (p. 19). 50% of 12-14-year-old teenagers and 75% of 15-16-year-old teenagers reported visiting a social network site as a daily online activity (p.30). The representative German study (Feierabend et al. 2022) reports similar numbers: 92% of teenagers between 12- to 19-years of age use smartphones daily, 84% are online in their free time every day (p.16).

It is difficult to “switch-off” modern teenagers and disconnect them from media they are used to in a normal environment as a part of an everyday routine. Thus, we focus on a rather extraordinary group that decided to take part in the adventure education programme “Classroom under Sails”. This program allows teenagers to sail around the globe for half a year and take part in different cutting-edge experiences (climbing, biking, living with indigenous groups). At the same time teenagers get normal school classes according to the schedule for the 10th grade of gymnasium (the German equivalent of a grammar school). During the whole trip, teenagers have very limited access to modern communication facilities and social media. The use of mobile telephones is only allowed during some land stops and for a strictly limited period of time; thus, teenagers have an almost complete break from the online world for half a year.

2. Methods

2.1 Sample

Each year 34 teenagers take part in the “Classroom under Sails” programme. All participants are volunteers. As there are normally three to four times more teenagers willing to take part in the program than places on board, teenagers go through a preselection process conducted by the organizational committee of the trip. The selection criteria are general motivation, fitness and an acceptable academic level. We had an opportunity to gather data from both selected and unselected teenagers and we have not found any significant differences in social media usage between these groups.

During this study, we gathered data from participants of four subsequent trips (each trip lasted from October until April): 2018-2019, 2019-2020, 2020-2021, 2021-2022. Every group had 34 participants from the beginning till the end of the journey, with the exception of the trip 2021/2022 where one participant had to quit, due to health problems. Thus, our sample has 135 teenagers between 14 and 16 years of age ($M=14.47$, $SD=.56$; 52% female). The majority of participants came from different regions of Germany, but there were also several German-speaking teenagers from Austria, Liechtenstein and the UK on board (3%).

We accompanied each group over the span of one and a half years (half a year before the trip, during the trip, and half a year after finishing). For this study we use data that we gathered just before the sailing trip and after the first three weeks of it. During this time teenagers experienced a complete media withdrawal.

2.2 Instruments

We used several instruments to capture teenagers’ usage of the social media in different time periods, including standardised questionnaires and open questions.

For this study we asked teenagers whether they used the following services: YouTube, Instagram, WhatsApp, Facebook, Twitter, and Snapchat. Teenagers could choose from four answers: “I have no profile here”, “I have a mostly inactive profile here”, “I have a profile and use it from time to time”, and “I have profile here and use it regularly”. The choice of social networks for this question was made taking into consideration the overall evidence of teenage use of social media in Germany at the beginning of the study (Feierabend et al., 2018, p.37-38).

During the trip teenagers answered the following open questions: “Do you miss social media (social networking sites, such as e.g. Facebook, or instant messaging services, such as e.g. WhatsApp)? What do you miss and why?”.

2.3 Procedure

We gathered data before the trip via the online data gathering web-application tool SoSci Survey. During the trip data were gathered with the help of paper-based questionnaires. All data were digitalized and analysed using the IBM SPSS Statistic Software (Version 29) and MAXQDA software. The collected data had no missing values: all teenagers gave answers to our questions. Data on use of social media profiles were not collected in the first year of our study - the trip of 2018-2019.

3. Results

3.1 Teenagers use of social media before the media withdrawal

We asked teenagers how often they use several popular social media services before the trip. The results are presented in Table 1.

WhatsApp service is the most intensively used platform according to teenagers’ self-evaluation. Only 5.9% of teenagers reported that they have no WhatsApp profiles. Teenagers who have a profile in this service, use it regularly (81.2% of teenagers: 90.4% of girls and 71.4% of boys). Almost four out of five girls and two out of three boys have an *Instagram* profile (73.3% of teenagers: 78.8% of girls and 67.3% of boys). 40.6% of teenagers (46.2% of girls and 34.7% of boys) use their Instagram profiles regularly. *YouTube* is also a popular platform among teenagers, with boys using it significantly more often than girls: 61.5% of girls and 85.7% of boys reported having an account here, with 21% of girls and 55% of boys having stated to use it regularly. *Snapchat* is used less often than services mentioned above; with girls being significantly more frequent users of the platform than boys: 51.9% of girls and 34.7% of boys reported having a profile here, 26.9% of girls and 12.2% of boys reported using their profiles regularly. At the same time, Twitter and Facebook are used only by 12.9% and 6.9% of teenagers respectively (no significant gender differences).

Table 1. Teenagers’ use of social media before media withdrawal

Social Media	no profile	mostly inactive profile	use profile from time to time	use profile regularly
WhatsApp	5.9%	0%	12.9%	81.2%
Instagram	26.7%	12.9%	19.8%	40.6%
YouTube*	26.7%	16.8%	18.8%	37.6%
Snapchat**	56.4%	8.9%	14.9%	19.8%
Twitter	87.1%	8.9%	4.0%	0%
Facebook	93.1%	6.9%	0%	0%

*Boys use this service significantly more than girls ($d=.83$, $p\leq.01$)

**Girls use this service significantly more than boys ($d=.43$, $p\leq.05$)

3.2 What teenagers miss after three weeks of complete media withdrawal

After three weeks of complete media withdrawal, we asked whether teenagers missed social media, which services they missed and why. All teenagers answered our questions, with answers being between one word (0.7%) and 110 words in length. The main responses to the question “Do you miss social media?” are presented in Figure 1.

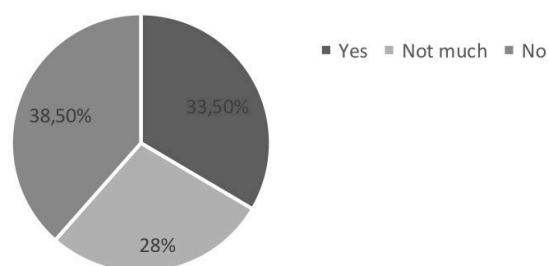


Figure 1. Teenagers responses to the question “Do you miss social media?”

Two thirds of teenagers reported that they do not miss social media or do not miss them much. Teenagers explained that with the following reasons:

- Social media are *stressful*: “I do not miss social networks much because I associate them with appointments and stress”; “it is much easier, when you do not need to know everything”; “I often feel overstrained by so many messages and have no desire then to answer all of them”, “the messaging services give me a feeling of speeding up time”, “I do not miss them because it is much more relaxed without them”, “The main reason why I do not miss anything is that now I am not under the pressure of these services”.
- Social media are *disturbing*: “I am not disturbed because of waiting for messages”, “here <on the ship> I do not need to take an effort to put away my mobile, because I just do not have one”.
- Social media are *a waste of time*: “without social media one has more time”, “I absolutely do not miss them since I already thought that I wasted too much time online”.
- Social media are *unnecessary when teenagers have enough contact with other people*: “I do not miss <social media>, because it is always possible to find friends somewhere on the ship. One has enough contact with other people here”; “I do not miss them much, as I feel good in the community”.
- Social media are only needed *to kill boredom*: “At home I am often alone and have nothing better to do, but here it is different”, “After all I was often on my mobile, when I was bored. Now I have better things to do and I like it”, “Here <on the ship> one has many other things to do and can live without <social media>”.

After three weeks offline every third teenager answered that he/she missed social media. The majority gave easy and fast communication with friends and family as the main reason: “What I think is especially good about social media is that it provides possibility to have a contact everywhere in the world <..> it is a great way to pass on messages”; “I miss the freedom to contact people whom I care about at any time”. One boy specified that he misses his online community.

Three teenagers mentioned explicitly missing news and news services “what happens and where is interesting to me”. One girl specified that she misses unrestricted contact to the world, not the media per se: “I miss less the services, but more the unrestricted contact to the outside world, not only family and friends, but also what happens in the World and on the Internet”.

Two teenagers explicitly mentioned missing entertainment, one girl wrote “Sometimes I miss social media, for instance in the evenings for entertainment/distraction and to kill boredom, I do not miss the permanent accessibility”.

One out of three teenagers referred to particular social media services in their answers. Table 2 shows how many teenagers mentioned which social media services.

Table 2. Services that teenagers mentioned in their answers after three weeks of media withdrawal

“Which social media services do you miss?”	Respondents
WhatsApp	23%
Instagram	11%
YouTube	2.2%
TikTok	2.2%
Snapchat	1.5%
Discord	1.5%
Signal	1.5%
iMessage	0.7%

3.2.1 WhatsApp

A total of 23% of teenagers – every fifth boy (20%) and every fourth girl (25.7%) - mentioned this service in their answers. One girl mentioned missing WhatsApp “to write with friends without too high costs. And to send pictures.” “<I miss only> WhatsApp to write with friends and family. The rest of my apps was just for pastime and here <on the ship> it is never boring for me”. Some teenagers who reported not missing social media still mentioned that it would be a pleasure to send messages or to chat in WhatsApp: “I miss WhatsApp because it was the possibility at very late or at very early hours to communicate with friends”. Only two teenagers mentioned WhatsApp in a negative context and reported that they do not miss it. One boy wrote: “I do not miss

WhatsApp because I get relatively many messages that do not concern me, and it means just work to read them and that's really annoying".

3.2.2 Instagram

One out of ten teenagers referred to Instagram. Half of the respondents mentioning Instagram in their answers reported missing it: "I miss Instagram as I can see there what my friends do", "I sometimes miss Instagram as I can scroll through the photos there to see what happens with my friends". At the same time, the other half of teenagers mentioned Instagram in a negative context: "I do not miss social networks, because I use Instagram at home just as a pastime"; "I do not really miss Instagram. I want to live in the moment <..> instead of looking at what my friends are doing at home"; "I do not miss <social networks>, because time here is so much better than to look at day stories of others, whom you do not really know. I spent too much time at home on Instagram." All teenagers mentioning Instagram in their answers were female, except for two boys (one reported missing it, whereas the other one stated being happy without it).

3.2.3 Other services

2.2% of teenagers mentioned missing YouTube in their answers, all of them - boys. One boy specified that he had especially missed YouTube at the beginning of the trip, while another boy specified that he missed YouTube only when he had nobody to spend time with. The same percentage of teenagers - 2.2% - referred to TikTok. All respondents mentioning TikTok in their answers were girls from the last trip (2021-2022). Whereas two girls reported missing it ("I sometimes miss laying in my bed and watching TikToks"), one mentioned it in a negative context: "I do not miss much such Apps as Instagram or TikTok because they are only for a pastime and when I think about it: they have no actual utility". Just a few teenagers mentioned Snapchat (one boy and one girl), Signal (two girls), Discord (one boy and one girl) and iMessage (one boy). These services were mentioned in the context of missing communication and exchange with friends through messages and pictures.

4. Discussion

Before media withdrawal the social media use of teenagers in our sample is largely consistent with results of the representative German-wide studies conducted by the Media Education Research Association Southwest (MPFS) (Feierabend et al. 2018, 2021, 2022). MPFS collects key figures on media use among 12- to 19-year-old teenagers in Germany every year and publishes them in so called annual JIM-study ("Jugend, Information, Medien"/"Youth, Information, Media"). According to the latest study, WhatsApp is the most important service for communication among teenagers: 93% use it regularly, 85% even on a daily basis (Feierabend et al. 2022, p.29). In our sample 94.3% of teenagers have a profile in WhatsApp and 81.2% reported using their profiles regularly. The second place - both in our sample and in the JIM-studies- is taken by Instagram. The latest JIM study reports that 62% of teenagers use it regularly (p.39). In our sample 73.3% - almost three out of four teenagers - reported using this service (78.8% of girls and 67.3% of boys). According to the JIM-study, Snapchat is used by 45% of teenagers, whereas in our sample 43.6% of teenagers have a profile in this service (51.9% of girls and 34.7% of boys). Thus, the popularity of the main social media – WhatsApp, Instagram and Snapchat - are almost the same among teenagers in our study and in the German representative sample.

The use of Twitter and Facebook appeared to be rather unpopular among teenagers in our study: only 12.9% and 6.9% of teenagers respectively have mostly inactive profiles or profiles that they use from time to time here. The JIM-study reports slightly higher popularity of these services among teenagers (28% and 11% respectively) (Feierabend et al. 2022, p.29). In general, such low popularity of these two services goes in line with other studies confirming the shift in the use of social networking sites in Europe in the last decade, with children migrating from Facebook to such platforms as Instagram and to instant messaging services like WhatsApp (Smahel et al. 2020, p.28).

Besides the services, described above, the JIM-study reports that teenagers use the following services in Germany in 2022: Discord (16%), Pinterest (13%), Facetime (12%) and Twitch (11%). The JIM-study has also revealed that the popularity of TikTok is rapidly growing among teenagers in the last years, with already 54% of teenagers using this service in 2022 (Feierabend et al. 2022, p.29). In our study we have not collected data on these services (at the beginning of our study in 2018 TikTok just became available worldwide after merging with Musical.ly). But these services will be considered in our further research.

Our study has confirmed gender differences in the use of social media services popular among teenagers that were reported in the JIM-studies. Girls are more active users of both Instagram and Snapchat. In the JIM-study

70% of girls and 54% of boys were found to use Instagram (Feierabend et al. 2018, p.29), whereas in our study 78.8% of girls and 67.3% of boys reported having a profile here. The JIM-study reports that 52% of girls and 38% of boys use Snapchat in Germany (2018, p. 29), in our sample 52% of girls and 35% of boys stated having a profile here. Thus, both the popularity level of Instagram and Snapchat among teenagers and the gender differences in use of these two services are almost the same in our sample and in the JIM-studies.

The use of YouTube - a huge repository of video content and a social networking platform – also depends on gender. In our sample boys used YouTube significantly more often than girls ($d=.83$, $p\leq .01$): they are more likely to have an account here and use their accounts more regularly than girls (85.7% of boys vs. 61.5% of girls and 55% of boys vs. 21% of girls respectively). The similar frequency of use and gender differences were also reported by the last JIM-study: 76% of teenagers were found to use the service (73.3% in our sample), with boys spending around 91 Minutes and girls around 73 Minutes daily on the platform (Feierabend et al. 2022, p.39).

Thus, the social media use among teenagers in our sample very closely corresponds to the reported German-wide numbers (Feierabend et al. 2022), with the following services being the main favorites – WhatsApp, Instagram, YouTube and Snapchat.

After three weeks of complete media withdrawal we asked teenagers whether they missed social media and which ones. In their answers, teenagers mentioned most frequently WhatsApp (23%), Instagram (11%), and YouTube (2.2%) – the same services they reported to use extensively before the withdrawal.

- *WhatsApp*

After three weeks of media withdrawal WhatsApp is the services that teenagers miss most of all: every fourth teenager mentioned this service in his or her answer. This is not surprising as it was the most used service among teenagers before the trip. The main reason for missing the service – an easy and fast communication with family and friends – is also not surprising, especially considering the specific context of the trip with complete separation from family and friends.

- *Instagram*

This service was mentioned by one out of ten teenagers. Whereas half of teenagers reported missing communicating with friends, watching timelines and posting pictures, the other half mentioned Instagram in a negative context. Here teenagers especially criticized spending too much time online. Only two boys named Instagram in their answers. The fact that more girls than boys were referring to Instagram is not surprising, as this service was more popular among girls before the trip; however, the gender gap here is more prominent than before the media withdrawal.

- *YouTube*

This service was mentioned by only 2.2% of teenagers. Though this service was one of the three most popular social media services before the trip, only a few teenagers – all of them boys - mentioned it in their answers. The main reason for this can be the fact that this service functions as a source of entertainment and information for them, whereas other services, that teenagers reported to miss, focus on communication and exchange with a personal social network.

TikTok was also mentioned by 2.2% of teenagers – all of them girls. This fact corresponds to the studies reporting the raise of popularity of this service especially among girls over the last years (Feierabend et al. 2022). Similar to Instagram, some respondents reported missing it, whereas others criticized it for being a pastime trap. The other services teenagers mentioned in their answers - Snapchat, Signal, Discord and iMessage - were all mentioned in the context of missing communication and exchange with personal social networks.

The desire for communication and in some cases the feeling of missing out seem to be the main reasons to miss social media among teenagers. The need for information in context of social media was reported only by a few teenagers. While for the majority of teenagers the time without social media was perceived as relaxing and stress-free, there were a few teenagers that missed social media as a source of relaxation and an efficient way to “switch-off”.

Whereas one third of teenagers reported to miss social media services, two thirds stated that they do not miss social media or miss them to a minor extent. One of the main reasons for not missing social media was a media-related stress. Stress was mostly reported to be triggered by a permanent availability and the need to react on incoming messages. Several teenagers described social media as disturbing and intruding on the offline life. The fear to miss something was also mentioned as one of stress factors. This goes in line with studies that

demonstrate the connection between social media and stress, e.g. the research shows that Facebook users feel pressure to access the service frequently due to the fear of missing out and “to keep up with relationship maintenance demands” (Fox und Moreland 2015). Research confirms that technology and media use affect stress levels even on a physiological level (Afifi et al. 2018). A short period of media abstinence already could induce a reduction in perceived stress (Turel et al. 2018).

Several teenagers reported that they were not missing social media because they had enough communication on board. They had enough people to communicate and felt good in the community. Thus, social media were perceived as a substitution for offline communication that becomes superfluous in a case of enough interpersonal communication offline.

Teenagers described social media as extremely time-consuming and reported having much more free time without social media. Social media were reported to kill boredom and be a “pastime trap”. It goes in line with research showing that proneness to boredom may predict problem Internet use (e.g. Skues et al. 2016) and problem smartphone use (Elhai et al. 2018; Ksinan et al. 2021).

5. Conclusions and limitations

In our study we analyzed whether teenagers missed social media after three weeks of complete media withdrawal and which services they referred to in this regard. The uniqueness of our study is that it does not only give insights into teenagers’ use of social media but also shows teenagers’ reactions to long-term media withdrawal.

After three weeks of complete media withdrawal two thirds of teenagers reported not missing social media or missing them only to a minor extent. Teenagers explained that with the following main reasons: social media are stressful, social media are disturbing, social media are time consuming, social media are redundant when teenagers have enough people around to communicate with and social media are only needed to kill boredom. However, every third teenager reported missing social media. The main reason was the desire to get in contact with a personal social network. Every fourth teenager reported missing WhatsApp. One out of ten teenagers referred to Instagram in their answers; however, just half of those in a context of missing it. The fact that teenagers miss WhatsApp and Instagram is not much surprising considering its high popularity among teenagers before withdrawal (94.3% of teenagers reported having a profile in WhatsApp and 73,3% of teenagers reported using Instagram). Just a few teenagers missed social media for information and entertainment purposes. Whereas YouTube service was among the main favorites among teenagers before the media withdrawal, only very few mentioned this service in their answers (2.2%).

Our study gives some insights in teenagers’ reactions on media withdrawal. However, more studies on users’ reactions and media usage patterns before/after media withdrawal are needed to evaluate its potential in curing social media addiction and internet overuse.

Our study has some limitations. There could be a slight bias resulting from the composition of our sample: teenagers taking part in the “Classroom under Sails” project are volunteers, meaning that they agreed to take a break from social media. The reaction of media withdrawal under other circumstances could be different. The context in which teenagers were immersed is also rather unusual. Teenagers reported that they had enough communication offline and felt good in the new community that made online social networks superfluous for them to some extent. The generalizability of the results from this study could be improved by the use of a representative control group. However, it is questionable whether it could be possible to gather a control group in which teenagers would voluntarily refrain from using social media in their everyday environment on a long-term basis.

Acknowledgements

We would like to express our gratitude to Dr. Ruth Merk, the operational manager of the “Classroom under Sails” programme, for her support in gathering research data and our diligent student assistant Berit Breins for the literature search.

References

- Afifi, Tamara D.; Zamanzadeh, Nicole; Harrison, Kathryn; Acevedo Callejas, Michelle (2018) "WIRED: The impact of media and technology use on stress (cortisol) and inflammation (interleukin IL-6) in fast paced families", *Computers in human behaviour*, Vol. 81, pp. 265–273.
- Dimock, Michael (2019): "Defining generations: Where Millennials end and Generation Z begins", (online), in: *Pew Research Center* <https://www.pewresearch.org/fact-tank/2019/01/17/where-millennials-end-and-generation-z-begins/>.
- Elhai, Jon D.; Vasquez, Juanita K.; Lustgarten, Samuel D.; Levine, Jason C.; Hall, Brian J. (2018) "Proneness to Boredom Mediates Relationships Between Problematic Smartphone Use with Depression and Anxiety Severity", *Social Science Computer Review*, Vol. 36 (6), pp. 707–720.
- Feierabend, Sabine; Rathgeb, Thomas; Kheredmand, Hediye; Glöckler, Stephan (2021) *JIM-Studie 2021. Jugend, Information, Medien: Basisuntersuchung zum Medienumgang 12- bis 19-Jähriger*. Stuttgart: Medienpädagogischer Forschungsverbund Südwest.
- Feierabend, Sabine; Rathgeb, Thomas; Kheredmand, Hediye; Glöckler, Stephan (2022) *JIM-Studie 2022. Jugend, Information, Medien: Basisuntersuchung zum Medienumgang 12- bis 19-Jähriger*. Stuttgart: Medienpädagogischer Forschungsverbund Südwest.
- Feierabend, Sabine; Rathgeb, Thomas; Reutter, Theresa (2018) *JIM-Studie 2018. Jugend, Information, Medien: Basisuntersuchung zum Medienumgang 12- bis 19-Jähriger*. Stuttgart: Medienpädagogischer Forschungsverbund Südwest.
- Fernandez, David P.; Kuss, Daria J.; Griffiths, Mark D. (2020) "Short-term abstinence effects across potential behavioral addictions: A systematic review", *Clinical psychology review*, Vol. 76, pp. 101-128.
- Fox, Jesse; Moreland, Jennifer J. (2015) "The dark side of social networking sites: An exploration of the relational and psychological stressors associated with Facebook use and affordances", *Computers in human behaviour*, Vol. 45, pp. 168–176.
- Gioia, Francesca; Boursier, Valentina (2019): Treatment of Internet Addiction and Internet Gaming Disorder in Adolescence. In: Harish Chandan und Bahadır Bozoglan (Hg.): *Multifaceted Approach to Digital Addiction and Its Treatment*: IGI Global (Advances in Psychology, Mental Health, and Behavioral Studies), pp. 157–176.
- Hoffner, Cynthia A.; Lee, Sangmi; Park, Se Jung (2016) "'I miss my mobile phone!': Self-expansion via mobile phone and responses to phone loss", *New Media & Society*, Vol. 18 (11), pp. 2452–2468.
- Ksinan, Albert J.; Mališ, Jiri; Vazsonyi, Alexander T. (2021) "Swiping away the moments that make up a dull day: Narcissism, boredom, and compulsive smartphone use", *Current Psychology*, Vol. 40 (6), pp. 2917–2926.
- Kuss, D. J.; Griffiths, M. D.; Karila, L.; Billieux, J. (2014): Internet addiction: a systematic review of epidemiological research for the last decade. In: *Current pharmaceutical design* 20 (25), pp. 4026–4052.
- Prensky, Marc (2001) "Digital Natives, Digital Immigrants Part 2: Do They Really Think Differently?", *On the Horizon*, Vol. 9 (6), pp. 1–6.
- Skues, Jason; Williams, Ben; Oldmeadow, Julian; Wise, Lisa (2016) "The Effects of Boredom, Loneliness, and Distress Tolerance on Problem Internet Use Among University Students", *International Journal of Mental Health and Addiction*, Vol 14 (2), pp. 167–180.
- Smahel, D.; Machackova, H.; Mascheroni, G.; Dedkova, L.; Staksrud, E.; Olafsson, K. et al. (2020) "EU Kids Online 2020. Survey results from 19 countries", (online): [EU-Kids-Online-2020-March2020.pdf \(lse.ac.uk\)](https://www.lse.ac.uk/eu-kids-online/2020-March2020.pdf).
- Stieger, Stefan; Lewetz, David (2018) "A Week Without Using Social Media: Results from an Ecological Momentary Intervention Study Using Smartphones", *Cyberpsychology, behavior and social networking*, Vol.21 (10), pp. 618–624.
- Su, Wenliang; Han, Xiaoli; Yu, Hanlu; Wu, Yiling; Potenza, Marc N. (2020): Do men become addicted to internet gaming and women to social media? A meta-analysis examining gender-related differences in specific internet addiction. In: *Computers in human behaviour*, 113.
- Talis, Geoffrey (2022): Internet Addiction. In: Evaristo Akerele (Hg.): *Substance and Non-Substance Related Addictions*. Cham: Springer International Publishing, pp. 99–107.
- Turel, Ofir; Cavagnaro, Daniel R.; Meshi, Dar (2018) "Short abstinence from online social networking sites reduces perceived stress, especially in excessive users", *Psychiatry research*, Vol. 270, pp. 947–953.
- Zajac, Kristyn; Ginley, Meredith K.; Chang, Rocio; Petry, Nancy M. (2017): Treatments for Internet gaming disorder and Internet addiction: A systematic review. In: *Psychology of addictive behaviors : journal of the Society of Psychologists in Addictive Behaviors* 31 (8), pp 979–994.
- Zhou, Xingchen; Rau, Pei-Luen Patrick; Yang, Chi-Lan; Zhou, Xiaofei (2021) "Cognitive Behavioral Therapy-Based Short-Term Abstinence Intervention for Problematic Social Media Use: Improved Well-Being and Underlying Mechanisms", *The Psychiatric quarterly*, Vol. 92 (2), pp. 761–779.

The Social Media Manager Career: Accounting, tax, and Social Security Framework for a Self-employed Person in Portugal

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Abstract: Purpose – The main goal of this paper is to understand the legal framework of the self-employed worker in the social media management area. Design/methodology/approach – The research uses the legal research method to analyse Portuguese legal resources such as the personal income tax law, the accounting law, and the social security law. Findings – The results show that a self-employed worker needs to pay attention to several legal commitments to fulfil all the obligations concerning the activity's development. This fact implies knowledge in all dimensions, mainly accounting, taxation, and social security. In the accounting domain, the Portuguese social media manager needs to know concepts related to the applied accounting system to recognise economic operations. The accounting legal framework can represent consequences in the tax sphere. The manager has two tax options in the personal income tax domain, according to the simplified regime and the organised accounting system. The second option implies that workers have an accountant to certify the activity accounts. In the social security domain, the law foresees a lot of legal obligations that are of frequent accomplishment, including the social security payment. Each scope has specific requirements that need to be observed and needs substantial knowledge that marketing people sometimes do not have, thus, it is frequent to recur to an accountant service to get help. This decision represents the increase of the context costs to the employee. The research of this case study evidences how the Portuguese tax system is complex and the difficulties the self-workers can feel when making-decision to develop the activity on their one.

Keywords: Accounting, Portugal, Social Media Manager, Social Security, Tax

1. Introduction

In recent years, social media management has been consolidated as a strategic activity in corporate communication, and it is relevant the world's population presence on these platforms. Despite its importance, this reality is still a challenge for many companies because it is necessary to manage relatively new channels which are constantly changing. Sector companies to follow the digital transformation launch new features, forcing the users to adapt constantly. For example, Instagram recently removed public viewing from the number of likes, or Facebook, in 2018, announced a change in the algorithm, giving more relevance to posts from personal profiles, to the detriment of corporate pages. To face these challenges, companies need specialised workers or use outsourcing services in social media management.

The main goal of this paper is to understand the legal framework of the self-employed worker in the social media management area. In particular, it seeks to analyse the accounting, tax and social security legal context of the self-employed social media manager (SMM). To achieve the goals, the study researches Portuguese legislation, especially accounting standards, personal income tax law, value-added tax, and social security dispositions.

Five sections compose this work, firstly, the introduction explains the reasons and objective for the study; second literature review and methodology; third, the research's results; after that, the discussion of findings; and finally, the concluding remarks.

2. Literature review and methodology

With the rapid development of the Internet, communication tools are no longer limited to traditional media (Hsu, Su, & Tsai, 2015). Companies have become aware of the rapid emergence of social media in recent years. Social media marketing has become an important field that demands attention, especially its changing marketing

strategies (Grazel & Openshaw, 2015). It is necessary to appoint a professional to manage a company's social media platforms to attract consumers.

Hsu et al. (2015) develop a two-part model to assist employers in choosing the ideal SMM. The first part derives criteria for choosing a social media manager by conducting a thorough literature review and using the modified Delphi method. The second part applies the analytical hierarchy process to calculate and identify the most suitable social media manager by ranking candidates according to the relative weights of the evaluation criteria. In addition, a famous restaurant chain in Taiwan is used as an example to demonstrate how a social media manager is selected by applying this model. The results show that companies emphasise social networking capabilities, professional skills, innovation, personal characteristics, and social skills.

Lovari and Materassi (2021) investigate the role of social media managers as trust mediators and access points in the local government context. The researchers adopt a qualitative methodology, using semi-structured in-depth conversations with a selected panel of PR professionals managing media channels on behalf of eleven Italian municipalities. SMMs are aware of having a key role in creating trust, and trust is a design value of their work. Lovari and Materassi (2021) show many "trust signals" that SMMs consider relevant to foster trust in the digital ambient and relations with citizens within the municipal context.

In this conceptual background, this study aims to answer one question: What kind of legal questions a self-employed person in the social media area needs to fulfil? In order to answer the research question, legal structures of Portuguese jurisdiction were investigated, namely, the accounting normalization system - *Sistema de Normalização Contabilística* (SNC), the personal income tax law - *Imposto sobre o Rendimento das Pessoas Singulares* (IRS), Value added tax - *Imposto sobre o Valor Acrescentado* (IVA), and finally, social security law - *Regime Contributivo da Segurança Social* (SS).

3. Results: Development of activity as a self-employed person

3.1 Accounting framework

In Portugal, the accounting system, which is being applied, was approved by the decree law n.º 158/2009, and it is underpinned in the accounting legislation adopted by the European Union, in particular International Accounting Standards (IAS) and International Financial Reporting Standards (IFRS) (Kieso, Weygandt, & Warfield, 2020). This system has been in force since 2010 and is applied to Portuguese companies (Aldeia, 2021). Nevertheless, individuals are exempt from organising the financial information according to the SNC from the provisions of Article 3 in the case of a net turnover not exceeding €200,000 on average over the last three years (Borges, Rodrigues, & Rodrigues, 2021). Although there is this exemption, self-employee should maintain the economic operations record because it is essential for tax determination purposes, such as IRS and IVA. Thus, the worker can opt for the adoption of the accounting standards' application (J. Rodrigues, 2021).

The SNC foresees 28 accounting standards¹ that clarify each accounting topic's specific application. Other than these rules, the SNC also approved two accounting and financial reporting standards - *Normas de Contabilidade e de Relato Financeiro* (NCRF), which allow the simplification of the accounting process applied to medium and small entities. The accounting standard for small companies can be one of the standards adequate for adoption by the self-employed person. In that case, the entity recognises each accounting standard element, namely, incomes, expenses, assets, liabilities and equity. These elements are essential to prepare the primary financial statements, particularly the financial position and comprehensive income statements.

¹NCRF 1 - Structure and Content of Financial Statements; NCRF 2 - Cash Flow Statements; NCRF 3 - First-time Adoption of Accounting and Financial Reporting Standards; NCRF 4 - Accounting Policies, Changes in Accounting Estimates and Errors; NCRF 5 - Related Party Disclosures; NCRF 6 - Intangible Assets; NCRF 7 - Property, Plant and Equipment; NCRF 8 - Non-Current Assets Held for Sale and Discontinued Operations; NCRF 9 - Leases; NCRF 10 - Borrowing Costs; NCRF 11 - Investment Property; NCRF 12 - Impairment of Assets; NCRF 13 - Interests in Joint Ventures and Investments in Associates; NCRF 14 - Business Combinations; NCRF 15 - Investments in Subsidiaries and Consolidation; NCRF 16 - Exploration for and Evaluation of Mineral Resources; NCRF 17 - Agriculture; NCRF 18 - Inventories; NCRF 19 - Construction Contracts; NCRF 20 - Revenue; NCRF 21 - Provisions, Contingent Liabilities and Contingent Assets; NCRF 22 - Grants and Other Support from Public Entities; NCRF 23 - The Effects of Changes in Foreign Exchange Rates; NCRF 24 - Events After the Balance Sheet Date; NCRF 25 - Income Taxes; NCRF 26 - Environmental Matters; NCRF 27 - Financial Instruments; and finally, NCRF 28 - Employee Benefits.

3.2 Taxation framework

3.2.1 Income tax

In the personal tax domain, the self-employer is a taxpayer who qualifies as a tax resident in Portugal, thus, the income obtained in the activity is taxed in the IRS sphere (Esteves, 2019). Being a resident of Portugal, this person also pays taxes on Portuguese income and foreign-sourced income. As these incomes are earned under an outsourcing contract, they are classified as category B (business and professional income) because they are earned by an independent professional (Pereira, 2019). In this case, there is no subordination of the self-employer to the client, such income should, as a general rule, be classified under category B (Catarino & Guimarães, 2021). These service providers should register their activity with the Tax Administration and issue invoices for the services they provide, and are taxed at general and progressive rates. Additionally, depending on the turnover, such professionals may be subject to the simplified regime or organised accounting regime (Cupertino, 2005). There is significant difference between the two methods. In the first method the taxable income is determined based on coefficients. In contrast, the second one considers the net profit calculated under the accounting standards and corrected according to the rules of the IRS, which references the corporate income tax law - Imposto sobre o Rendimento das Pessoas Coletivas (CIRC).

The simplified regime is the most common option for the taxation of income of individual companies, and this regime is assigned by default by the Tax and Customs Authority at the moment of informing of the beginning of activity (Catarino & Guimarães, 2021). This regime is ideal for smaller and less complex activities, as it is the case of the self-employed social media manager. This method does not allow the deduction of expenses related to the activity, however, there are fewer tax obligations and extra expenses. To benefit from this regime, it is necessary to fulfil some requirements, for example: (1) be a taxable person resident in Portugal, (2) not be legally obliged to have statutory audits, (3) have an annual gross income of fewer than 200 thousand euros, and (4) to have a balance sheet for the previous tax period of fewer than 500 thousand euros. Taxation under these assumptions has advantages and disadvantages, the main positive aspects are: (i) there is no obligation to hire a certified accountant and (ii) it does not imply as many obligations as the organised accounting regime nor additional expenses. The main disadvantage is that it is impossible to deduct expenses since the Tax Authority considers that 75% of the income obtained is net and the remaining 25% corresponds to expenses. About 75% of the declared income is considered for taxation purposes (Faustino, 2017), the remaining 25% are considered specific expenses of the activity and, therefore, are tax-free. Thus, business expenses such as travel and acquisition of goods are not declared. The simplified regime is characterised by the taxation of earned income by applying coefficients, that in this case, rendering services from the list of professional activities is 75%².

3.2.2 Value-added tax law

In the Value Added Tax domain, a social media manager can also be a taxpayer according to its framework in the IVA sphere (Lança, 2012). The legal framework depends on the annual turnover, the independent worker can benefit from an exemption or be a taxpayer with general obligations, as are large companies (Lima, 2003). The exemption from VAT is foreseen in article no. 53 of IVA law, this legal disposition determines that when the entity has an annual value of services provision of fewer than 13,500 euros, it can be exempt. It states that an individual does not assess IVA to its customers and can not deduct the VAT that pays in the activity's expenses (Palma, 2011).

If an annual turnover exceeds 13,500 euros, the self-employed person is framed in the VAT general regime. It means that the worker receives the VAT amount directly from the company and the payment for the services. Periodically, independent prepare and submit the VAT statement, which involves the VAT received from the customers and the VAT paid in the goods and services acquisition (Carrapiço, 2022). In other words, the company pays the VAT amount to the employee, and the employee later hands it over to the State. Social media manager

² Article 151 of the IRS.

services are subject to a VAT rate of 23%, and the employee must mark this charge on the invoice to receive the corresponding amount from the company.

The VAT declaration is monthly or quarterly, depending on the employee's turnover. Those who receive less than 650,000 euros per year can be on the quarterly statement regime. When the annual amount of services provided exceeds that limit, the legal obligation becomes monthly (Nabais, 2021).

Generally, the quarterly VAT return must be filed by the 15th of the second month following the quarter to which the services relate, except the second quarter statement because of the holiday period. It means that the statement for January, February and March should be delivered until May 15th; the same for the third and fourth trimesters, which should be delivered until November 15th and February 15th, respectively. The declaration of April, May and June should be submitted by August 15th, nevertheless, recently, the State Budget 2023 stated a new feature, the deadline for the submission of the second quarter would be extended from August 20th to September 20th, and the payment can be made until September 25th.

4. Social security

The framework on social security depends on the legal framework in the Tax Authority in the personal income tax domain, in particular, it depends on the option for a simplified regime or organised accounting regime. The organised accounting regime foresees that the relevant income corresponds to the taxable income value ascertained in the preceding calendar year (Conceição, 2020). Thus, the rules establish that in the simplified regime, the determination of the net income relevant for social security purposes considers 70% of the total value of the provision of services (ISS, 2018). The amount of services provided is calculated based on the income obtained in the three months immediately before the month of the Quarterly Statement (A. Rodrigues, 2020).

The contribution obligation of the self-employed comprises (i) the payment of contributions, (ii) the Quarterly Declaration of the values corresponding to the activity performed, and finally, (iii) the Annual Activity Statement, the annexe SS to IRS Statement (Carrapiço, 2022). The same way that every quarter taxpayer is required to declare the total value of income associated with the provision of services and other income necessary for calculating relevant income. Consequently, this declaration is made by the last day of April, July, October and January for the income obtained in the three immediately preceding months. Each January, even if the independent worker is not subject to the obligation to pay taxes, worker must declare the amounts earned in the previous calendar year. Generally, the contribution rate for independent workers is 21.4%.

5. Discussion

A survey of the entrepreneur's monthly obligations was made, and the following table was constructed:

Table 1: Legal obligations of the self-employed person

Legal obligation	JAN	FEB	MAR	ABR	MAI	JUN	JUL	AGO	SEPT	OUT	NOV	DEC
SAFT delivery (communication of income to finance)	8	8	8	8	8	8	8	8	8	8	8	8
IRS Declaration						30						
Payment of IRS								31				
Confirmation of invoices for IRS		25										
Confirmation of household for IRS		15										
Payments on Account							20		20			20
VAT declaration		20			20				20		20	
Payment of VAT		25			25				25		25	
Social Security Payment	20	20	20	20	20	20	20	20	20	20	20	20
Social Security Quarterly Statement	31			30			31			31		

The analysis of Table 1 allows understanding the several legal obligations that the independent assume when deciding to develop the activity. 43 fiscal requirements which need to be fulfilled during to fulfil during the one

year of the activity's development can be identified. This aspect implies spending time accomplishing all requirements or hiring accounting or tax advisory services, consequently, additional costs. In Portugal, social media managers are subject to IRS taxation in their personal sphere, the income earned from the activity is considered the basis for applying the personal income tax. These professionals are not exempt from taxation but should pay taxes under their ability to pay. In the case of concealment of such income, the tax authorities have mechanisms to control anomalous tax situations, including those of an administrative offence or criminal nature. These mechanisms for taxing unjustified wealth and asset increases are based on indirect assessment methods. The legislator shifts the burden of proof to the taxpayer, who need to demonstrate that did not earn the income that the law allows the Administration to presume.

6. Conclusions

This paper seeks to understand the Portuguese legal context of the self-employed person in the social media area. The findings allow understanding that social media activity requests knowledge in different areas, which consumes time for the services provider. Accounting, tax, and social security dimensions impose several legal rules that involve relevant penalties when they are not fulfilled. Depending on the annual turnover, the independent can address accounting, fiscal and social security obligations on your own or recurring to specialised service. In the cases of the lower annual amount of provided services, independent workers solve all the questions without professional help, nevertheless, it requires technical knowledge that sometimes manager does not have, therefore incurring in additional costs. When annual turnover reaches higher values, the law requires the legal intervention of a certified accountant.

The study highlights various aspects of the tax and accounting sphere in the development of the activity. It would be important to research the legal obligations to be observed that fall outside the tax field, such as, the obligations to be fulfilled when opening a physical store for the sale of digital equipment, providing advisory services or even training in the area. The fact that the study analyzes the Portuguese accounting and tax framework is a limitation, a comparative study with other tax systems would be relevant.

Acknowledgements

This work was supported by the UIDB/05105/2020 Program Contract, funded by national funds through the FCT I.P.

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References

- Aldeia, S. C. R. (2021). The goodwill of business concentrations. Accounting, tax, and arbitral court perceptions in portugal. *Journal of Legal, Ethical and Regulatory Issues*, 24(S11). Retrieved from <https://www.abacademies.org/articles/the-goodwill-of-business-concentrations-accounting-tax-and-arbitral-court-perceptions-in-portugal.pdf>
- Borges, A., Rodrigues, A., & Rodrigues, R. (2021). *Elementos de Contabilidade Geral, SNC - Sistema de Normalização Contabilística* (27ª Edição ed.). Lisboa: Áreas Editora.
- Carrapiço, J. (2022). *Preenchimento da declaração periódica do IVA e anexos 2022 (Completing the periodic VAT return and attachments 2022)*. Lisboa: Ordem dos Contabilistas Certificados.
- Catarino, J. R., & Guimarães, V. B. (2021). *Lições de Fiscalidade - Princípios Gerais e Fiscalidade Interna*. Coimbra: Almedina.
- Conceição, A. J. B. (2020). *Segurança Social - Manual prático* (12ª ed.).
- Cupertino, L. (2005). O regime simplificado no imposto sobre o rendimento: enquadramento e questões. *Fisco*, 119/121, 145-158.
- Esteves, L. F. (2019). *Atualização fiscal em IRS - aspetos práticos*. Lisboa: Ordem dos Contabilistas Certificados.
- Faustino, M. (2017). Imposto sobre o rendimento das pessoas singulares. In *Lições de Fiscalidade. Princípios gerais e fiscalidade interna* (5ª ed., Vol. I). Coimbra: Almedina.
- Grazel, J., & Openshaw, J. (2015). *Do We Need a Social Media Manager?* Chichester: John Wiley & Sons Ltd.
- Hsu, P. F., Su, Y. W., & Tsai, C. W. (2015). Developing a Hierarchy Model for Selection of Social Media Manager. *International Journal of E-Adoption*, 7(1), 17-31. doi:10.4018/ijea.2015010102

- ISS. (2018). *Guia Prático – Pagamento de Contribuições à Segurança Social*. Retrieved from http://www.seg-social.pt/documents/10152/25521/2015_pagamento_contribuicoes_seguran%C3%A7a_social/9b10b5b3-9096-4ec0-b0a2-e5a123182eb0
- Kieso, D. E., Weygandt, J. J., & Warfield, T. D. (2020). *Intermediate Accounting, 4th Edition, IFRS Edition* (4th ed.): Wiley.
- Lança, C. (2012). O Imposto sobre o valor acrescentado. In *Lições de fiscalidade* (pp. 289-324). Coimbra: Almedina.
- Lima, E. V. (2003). *IVA: O imposto sobre o valor acrescentado, comentado e anotado* (9ª ed.). Porto: Porto Editora.
- Lovari, A., & Materassi, L. (2021). Trust me, I am the social media manager! Public sector communication's trust work in municipality social media channels. *Corporate Communications*, 26(1), 55-69. doi:10.1108/ccij-01-2020-0027
- Nabais, J. C. (2021). *Direito Fiscal* (11ª (reimpressão) ed.). Coimbra: Almedina.
- Palma, C. C. (2011). *Introdução ao Imposto sobre o Valor Acrescentado* (5ª ed.). Coimbra: Almedina.
- Pereira, P. R. (2019). *Manual de IRS* (2ª ed.): Edições Almedina.
- Rodrigues, A. (2020). *Direito da Segurança Social*. Vila Nova de Famalicão: Nova Causa.
- Rodrigues, J. (2021). *Sistema de Normalização Contabilística. SNC explicado* (8ª ed.). Porto: Porto editora.

Studying the Influence of Toxicity and Emotion Features for Stress Detection on Social Media

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Abstract: It is crucial to detect and manage stress as early as possible before it becomes a severe mental and physical health problem. Some authors even introduce stress as a “silent killer” to emphasize the significance of early stress management. Traumatic global events such as COVID-19 have amplified stress throughout online communities and it is quite common to see that social media users often vent about their problems or situations online. The ability to detect a person's stress from their posts on social media platforms like Reddit or Twitter in a timely manner can help early stress management and consequently counters mental health conditions. In order to detect stress from social media posts, we must obtain the characteristics that signal a user's stress. Which motivates us to study how salient features influence stress detection. On social media, text-based methods of communication predominantly overtake verbal forms, which makes these platforms a convenient rich medium with an extensive amount of text content to analyze a user's thoughts and emotions. We present a novel approach that helps improve stress detection on social media textual content with sentiment, emotion, and toxicity features. We design our framework based on multiple Transformer-based state-of-the-art sentiment, emotion, and toxicity analysis tools and models for feature extraction and discuss the stress detection tasks' interpretability via inspecting multiple dimensions. For the evaluation, we use publicly available and high-quality datasets where the social media posts are real, carefully selected and labeled. Our experiments show the influence of the proposed new feature dimensions on stress detection by comparing the state-of-the-art baselines and suggesting future directions in stress detection on social media. Furthermore, our extensive feature correlation analysis highlights different aspects, such as 1) *Positive* and *Negative* sentiment, 2) *Joy*, *Sadness*, and *Fear* emotions, and 3) *Obscene* and *Insult* toxicity as governing factors in improving stress detection performance.

Keywords: Stress Detection, Social Media, Natural Language Processing, Emotional Analysis, Toxicity Analysis

1. Introduction

The national library of medicine defines *stress* as a “feeling of emotional or physical tension. It can come from any event or thought that makes you feel frustrated, angry, or nervous” (MedlinePlus, 2016). Mental Health Foundation (2021) also adds to the definition that stress is our body's response to pressure that makes the person feel anxious, afraid, angry or aggressive, sad, irritable, frustrated, or depressed. Moreover, the American Psychological Association (APA) states that stress is a reaction to extant and future demands and pressures (APA, 2022). It can come from any event or thought that makes a person feel frustrated, angry, or nervous. According to the APA, global stressors are increasing due to reasons such as covid-19, inflation, and political climate. Furthermore, 27% of adults reported that stress impacts their day-to-day functioning; in fact, they report that most days, they are so stressed that they cannot function (APA, 2022). According to Mayo Clinic (2021), stress can harm your body, mood, and behavior, such as headaches, chest pain, anxiety, sadness, irritability, or anger outbursts. Similarly, Yaribeygi et al. (2017) have talked about the criticality of stress's impact on our lives and how it “can be either a triggering or aggravating factor for many diseases and pathological conditions. Therefore, it is crucial to understand stress and stressors more and counter stress before it develops into a complex mental or physical problem.

Many recent works have studied mental health and stress detection on social media as a proxy for identifying real-world stress and stressors (Naseem et al., 2022). This is because social media users often vent about their problems online and share their views, personal situations, and emotions with their followers, friends, and the public (Rastogi et al., 2022). Text-based social methods of communication are dominant when compared to verbal forms. This enables social media platforms to be a suitable medium with an ample amount of text content to study a user's thoughts and emotions. This led to many researchers praising and utilizing natural language processing (NLP) approaches to detect stress in social media (Sravanthi et al., 2020; Shao et al., 2021). State-of-

the-art works in stress detection on social media primarily focus on fine-tuning language models on a stress-labeled dataset (Rastogi et al., 2022; Naseem et al., 2022). Some works focused on studying much more fine-grained features, such as lexical and sentiment characteristics of the social media textual context towards stress detection (Thelwall, 2017; Turcan and McKeown, 2019). However, we could study additional feature dimensions to detect stress in textual content. For example, previously mentioned definitions of stress and its side effects reveal a pattern of stress-related emotions. Such as anger, aggression, and frustration reactions. Moreover, researchers claim that stressed users might exhibit toxic behavior and post toxic content (de Mesquita Neto and Becker, 2018). This necessitates the need to shed light on the emotional and the toxic features and their correlation on stress detection.

In our study, we hypothesize that emotions and toxicity features can correlate to stress labels alongside sentiment, which consequently influences the stress classification performance. We utilize state-of-the-art transformer-based pre-trained language models that were fine-tuned on social media content to extract sentiment, emotions, and toxicity features. Consequently, we use these extracted features to classify stress on social media posts. Furthermore, we conduct a feature correlation study to get a perspective on the effect of each individual sentiment, emotion, and toxic feature categories. To the best of our knowledge, we are the first to study to which extent stress can lead to toxic expressions on social media.

The major contributions of this paper are the following:

- We investigate novel feature dimensions for stress detection, which involves different Toxicity categories alongside the existing sentiment and emotion feature dimensions.
- We offer insights into how different emotion and toxic aspects relate to stress classification on social media.
- Empirical evaluation on benchmark datasets shows that our approach can improve stress detection across multiple social media platforms.

2. Related work

Stress Detection has been studied by researchers on different social media platforms. Turcan and McKeown (2019) have tackled it from a lexical perspective, where they have used Linguistic Inquiry and Word Count (LIWC) to analyze the lexical features of stress. TensiStrength stress and relaxation datasets were built on a lexical approach and a set of rules to detect direct and indirect expressions of stress or relaxation (Thelwall, 2017). Mauriello et al. (2021) conducted a linguistic analysis of the sentences to understand whether the lexical patterns differed enough for relatively accurate classification on their short conversation SMS-like stress dataset. Rastogi et al. (2022) have used popular lexicon-based methods such as VADER, Afinn, and So-cal to classify stress based on the sentiment of the text.

2.1 Sentiment analysis in stress detection

Sentiment analysis is an essential part of stress detection and is implemented in nearly all the studies in this area. Rastogi et al. (2022) have classified stress based on the output of the sentiment analysis models such as VADER, Afinn, and So-cal. Turcan and McKeown (2019) have used the pattern sentiment library for the lexical features. Thelwall (2017) illustrated in their work how stress detection is similar to the existing task of detecting sentiment in text. In recent years, pre-trained transformer-based models have been used to extract sentiment from textual content. For example, Cardiff-NLP's model (Barbieri et al., 2020) is one of the cutting-edge NLP tools for sentiment extraction in social media content as stated by Camacho-Collados et al. (2022) and Matos et al. (2022). Besides, this model has been implemented across multiple domains and related tasks, such as finance (Choya et al., 2022) and opinion polarity analysis (Medina et al., 2022).

2.2 Emotional cues in stress detection

Emotions play an integral part in stress detection. Rastogi et al. (2022) emphasize that analyzing mental health via text data can be done by recognizing emotions closely related to the state of stress/depression, such as anxiety, confusion, and annoyance. Users tend to post content with various negative expressions of emotions when stressed (Turcan and McKeown, 2019). Stress and negative emotions often co-occur, with each able to be a cause and effect of the other (Lazarus, 2006). Thelwall (2017) utilized a lexicon-based approach using terms related to anger and negative emotions. Mauriello et al. (2021) approach to stress detection is from the

emotional turmoil perspective, where stress results from the person's inner perceptions, emotional distress, or anxiety. On the other hand, Rastogi et al. (2022) have focused entirely on emotion classification for stress detection when building datasets and models. For this means, their proposed model classifies the sentences into the six basic emotions theorized by Paul Ekman (1992) (i.e., anger, disgust, fear, joy, sadness, and surprise). We also employ Ekman's model of core emotions because of its known useability in emotion categorization and psycho-linguistic studies (Rozado et al., 2022; Butt, 2022).

2.3 Toxicity relation to stress in social media

Toxicity and stress are often correlated. Fan et al. (2021) focused on the toxic language generated by people from all political spectrums who have taken social media sites like Twitter to vent their frustrations and give their opinions. Additionally, they stated that people become frustrated by the other group and start using toxic language. Similarly, de Mesquita Neto and Becker (2018) have claimed that in situations where stress is elevated, people tend to show toxic behavior and send toxic messages that contain complaining and insults. Emmerich et al. (2020) have suggested that a toxic behavior can be expressed when a person is under stress and finds an outlet to release stress. Moreover, Chong and Kwak (2022) introduced mental health and stress comments as toxicity triggers. Almerexhi et al. (2020) illustrate in their work that toxicity can be contagious and that toxic comments trigger other users to post toxic responses. Here we see a vicious cycle where stress influences toxic content and vice versa. Consequently, it motivates us to study the relationship between stress and toxicity in social media.

3. Methodology

In this section, we go through the proposed approach. Figure 1 indicates the model's architecture. As previously mentioned, our model and experiments aim to understand how emotion and toxicity affect stress detection. To this end, we use components to extract the emotion and toxicity of text. Mainly our approach consists of the following three feature extraction components: (1) a sentiment analysis component to extract the sentiment of text, (2) a toxicity component to detect the toxicity-related scores of a given text, and (3) an emotion analysis component that categorizes the emotion of the text.

These components are based on pre-trained transformers, which are deep neural networks that learn the words' context and, consequently, the meaning via a mechanism known as self-attention, a form of differentially weighting the significance of each part of the input sentence when constructing word embeddings. These transformer architectures have reached prediction accuracies that match human annotations for text classification tasks (Devlin et al., 2018). We go through the details of each component in the following subsections.

3.1 Sentiment analysis component

To detect the general sentiment of text, we use an existing pre-trained transformer-based language model, RoBERTa, that was fine-tuned on millions of social media textual content (i.e., Tweets and posts) (F. Barbieri et al., 2020). This model outputs three scores, indicating the probability of the input text being *positive*, *negative*, or *neutral*.

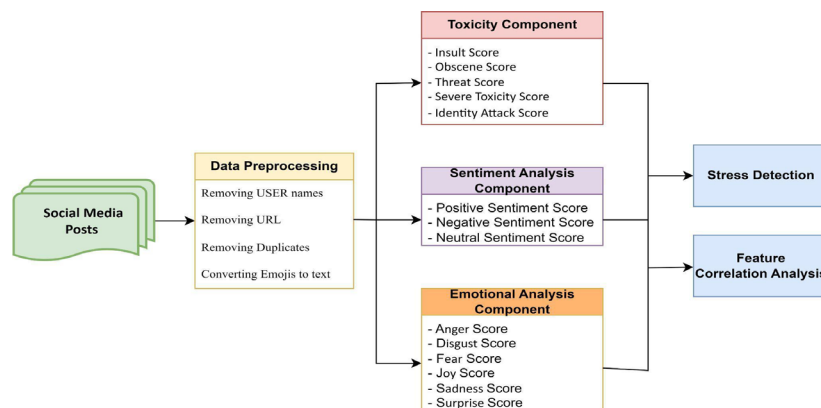


Figure 1: Our approach pipeline. It consists of Data input and preprocessing, Feature Extraction stage (i.e., Toxicity, Sentiment, and Emotions), Stress Classification, and Correlation Analysis.

3.2 Emotions analysis component

Emotions were calculated using a publicly available Transformer Distil-RoBERTa-based model. This model was trained and fine-tuned on a combination of multiple emotion datasets for English, predicting Ekman’s (1992) six basic emotions: *anger*, *disgust*, *fear*, *joy*, *sadness*, and *surprise*. The dataset used to train and fine-tune this model is diverse and is a combination of several publicly available datasets. The datasets include social media data from Twitter and Reddit, student self-post reports, and TV dialogs. Using such a diverse dataset increases the model's generalizability (Hartmann, 2022).

3.3 Toxicity detection component

To analyze the toxicity of the textual content, we used the state-of-the-art model, Detoxify (Hanu and Unitary team, 2020). Detoxify is based on transformer model BERT-base-uncased and has two variants, depending on the training set: (1) “Original” Detoxify, which is trained on Wikipedia comments, and (2) “Unbiased” Detoxify, which is trained based on the Jigsaw dataset. Both models output the probability of a given text in the following categories: *toxicity*, *severe toxicity*, *obscene*, *threat*, *insult*, and *identity attack*. We have tested our framework with both variants. Due to the performance similarity between the two variants, we use the Original Detoxify throughout the paper.

4. Experimental setting

In this section, we present details about the datasets and the implementation details of feature extraction and stress classification.

4.1 Datasets

We selected multiple popular datasets curated around the stress detection task. Our focus was on versatile datasets that can showcase the performance of stress detection models and their interpretability. The datasets were of different textual lengths, from short Twitter tweets to long Reddit posts. All the datasets' contents were pre-processed by removing the usernames and links and duplicates in addition to converting the emojis to text. It is worth mentioning that not all datasets have balanced label distribution. A summary of the datasets used is in Table 1. We go through the details of each dataset in the following subsections.

Table 1: Experimented Datasets and characteristics. The datasets are called balanced if the distribution of labels is around 50% ($\pm 5\%$).

Datasets	Label Balance	Topics (subreddits or hashtags)	Dataset Collection Period
Dreaddit Reddit (Turcan and McKeown, 2019)	balanced	Interpersonal conflict, Mental illness, financial need: r/relationships, r/homeless, r/food pantry, r/assistance, r/stress, r/ptsd, r/almosthomeless,r/anxiety, r/survivorsofabuse, r/domesticviolence	Between January 2017 and November 2018.
Social media articles Twitter (Rastogi, et al., 2022)	Twitter-Full balanced	Stress and non-stress: #Stress, #Stressed, #Tired, #FeelingUseless, #MentalHealthMatters, #MentalHealth, #FeelingStressed, #IamStressed, #Fatigued, #PandemicBlues, #Happiness, #Happy, #Delighted,#Joy,#Blessed.	Between September 2019 and September 2021.
	Twitter Non-Advert unbalanced		
Social media articles Reddit (Rastogi et al., 2022)	Reddit Title balanced	Stress and non-stress: r/Stressed, r/Stress, r/Depressing, r/Depression r/MentalHealth, r/Happy, r/MadeMeSmile, r/MakeMeSmile, r/Wholesome.	
	Reddit Combined unbalanced		

4.1.1 Dreddit

Turcan and McKeown (2019) collected Reddit posts and then annotated them using Amazon Mechanical Turk (AMT) (Amazon Mechanical Turk, 2018) to determine whether the posts exhibited the stress of the person who posted. It is an excellent resource for analyzing Reddit corpus. The dataset excels due to its complex and diverse data and characteristics across multiple topics, as shown in Table 1. The dataset includes 3,553 posts and focuses on major stressful topics such as homelessness and domestic violence. Posts in Dreddit are collected from 10 subreddits. Naseem et al. (2022) used Dreddit to investigate public health surveillance on social media and evaluate stress detection using social media posts.

4.1.2 Social media articles: Twitter and Reddit

Rastogi et al. (2022) collected a stress detection dataset from Reddit and Twitter. According to the datasets' creators, additionally, it effectively depicts the widespread stress levels caused by COVID-19. The two datasets were labeled automatically using a rule-based and pre-trained language model (PLM). They both include tweets and posts related to stress and non-stress topics, as shown in Table 1. In addition, the authors provided two Twitter datasets: (1) Twitter-Full: a dataset that includes all tweets, and (2) Twitter Non-Advert: which exclude tweets related to advertisements. Also, Reddit has two datasets: (1) Reddit Combined: includes posts body and title, and (2) Reddit Title: includes titles only.

4.2 Implementation details

Our experiment consisted of acquiring the scores for different toxicity categories mentioned in section 3.3. In addition to the six emotional features scores discussed in section 3.2 and the sentiment scores mentioned in 3.1. That will give us a total of 14 features. The evaluation was based on our model's accuracy in detecting the label of stress and the F1 score, which is an essential metric due to some datasets' imbalanced labels. This micro-averaging score will help us depict a comparable performance.

In order to evaluate the effectiveness of the model, we conducted a comparative analysis using multiple classification algorithms, including Random Forest, Multi-layer Perceptron (MLP), Adaptive Boosting, Gradient Boosting, and Extreme Gradient Boosting (XGBoost). Our experiments indicated that, on average, gradient boosting achieved higher accuracy compared to other classification algorithms. Specifically, for the Dreddit and Reddit title dataset Twitter non-advert, a majority of the feature combinations yielded high accuracy when using Gradient Boosting. Thus, we use Gradient Boost to present the findings of our work, as demonstrated in Table 2. Furthermore, for the Twitter-full dataset, Gradient Boosting was among the top performers in terms of accuracy. However, it was slightly behind the top performer, with an average difference of less than 1% compared to other algorithms. Please refer to **Appendix Table A.1** for more details.

We employed the StratifiedKFold cross-validation method to balance the class labels per fold and prevent overfitting to the dataset. Additionally, to examine the correlation and interpretability of the features, we utilized Pearson's correlation coefficient to measure the statistical relationship between variables. Furthermore, we conducted hypothesis testing using the P-value to confirm the statistical significance of our findings.

5. Experiment results and discussion

In this section, we show an ablation study where we reveal each feature set's influence on the stress detection task. To present and discuss our results, we categorize our experiment into the following two research questions.

RQ1. Can we use emotions and toxicity as features to better detect stress?

Our study shows that, yes, using emotions and toxicity can provide an improvement to the task of stress detection. Our experiment results in Table 2 show that combining all the features, including emotions and toxicity, gives us better F1 and accuracy scores. Moreover, we compare our results with the state-of-the-art baselines provided by the authors of the datasets Turcan and McKeown (2019) and Rastogi et al. (2022). Our Gradient boosting classifier with all three feature categories outperforms the lexical methods presented in the above papers. Also, for some datasets, our approach outperforms the transformer-based model. For example, in the Dreddit dataset, the authors achieved an F1 score of 80.65% via the pre-training Bert-base model. In comparison, our approach accomplished an increase of 2.23% to the F1 score without the need to fine-tune a large language model-based classifier. Meanwhile, for the other datasets, the pre-trained Roberta model

achieved an average increase of 3.94% in the F1 score compared to our model. However, this difference in performance is minimal if we consider that our approach needed no language model training and fine-tuning on stress-labeled datasets. In particular, while our approach uses a maximum of 14 features and a simple classifier training to detect stress, the Roberta model uses millions of parameters with an extensive fine-tuning process. Therefore, in addition to the simplicity, the performance of our approach is competitive and can be relied on as a baseline for detecting stress.

To further illustrate how significant each feature category is for the task of stress classification, we compare the average improvement when using sentiment alone versus when using sentiment, emotional, and toxicity. Here we observe an average improvement of 2.14% in accuracy and an average improvement of 1.85% in F1 score for all datasets. On the other hand, if we compare the average improvement when using the combinations of toxicity features and sentiment versus sentiment alone, we get an increase of 0.57% in accuracy and 0.7% in the F1 score. Here we emphasize that our aim in this study is not to build the best-performing stress classifier but to study the influence of toxicity and emotions on the task at hand. As a result, we conducted further analysis of our next research question to examine the proposed features and their implication for stress detection.

Table 2: Overall stress detection performance (Gradient Boosting model) using Accuracy and F1 scores. We mainly focus on F1 due to imbalanced labeling in some datasets.

Best Features of each model or class/dataset	Dreaddit		Twitter Full		Twitter non-advert		Reddit combined		Reddit title	
	Acc.	F1	Acc.	F1	Acc.	F1	Acc.	F1	Acc.	F1
Toxicity features	68.44	72.78	63.51	66.56	68.1	75.95	87.84	93.46	71.13	69.12
Emotional features	75.35	77.62	80.57	81.68	81.27	84.12	91.04	94.96	89.14	89.03
Sentiment features	81.56	82.62	80.15	80.49	80.51	83.58	91.52	95.23	90.59	90.28
Toxicity, Emotional features	77.13	79.36	80.75	81.89	82.28	84.98	91.68	95.34	90.11	89.28
Sentiment, Emotional features	80.32	81.83	82.58	83.2	83.8	86.15	92.16	95.56	91.49	91.31
Sentiment, toxicity features	81.21	82.85	80.98	81.52	81.27	84.12	92.03	95.49	91.68	91.73
All features	82.37	82.88	82.58	83.24	85.06	87.31	92.96	96.2	92.04	91.84

RQ2. Which sentiment, emotion, and toxic aspects benefit stress detection the most?

This research question explores the influence of all the sentiment, emotion, and toxic features on the stress label via correlation analysis. We started by studying the affect of different sentiments on stress detection. As shown in Table 3, the *positive* sentiment has the highest inverse correlation for the stress label for all datasets, with an absolute average of 0.67. Additionally, the *negative* sentiment is directly correlated to the stress label for all datasets, with an absolute average of 0.59. Sentiment analysis is an essential part of stress detection and has been implemented in previous research Rastogi et al. (2022) and Thelwall (2017). We observe that neutral sentiment has conflicting correlations across the different datasets. We attribute this abnormality to the dataset labeling process. For instance, Turcan and McKeown (2019) Dreaddit dataset annotation was manual, and the annotators were instructed to label a post as stressful only if that post displayed stress and a negative attitude. In contrast, Rastogi et al. (2022) labeling process labeled a post as stressful if that post displayed stress and either a neutral or negative attitude. As a result, we see a positive correlation between the stress label to the neutral sentiment in the (Rastogi et al., 2022) datasets.

For Emotions, we observe that the emotion of *Joy* is inversely correlated to stress, and it shows the most emotional absolute average correlation, with an absolute average of around 0.54. *Sadness* and *Fear* are directly correlated to stress and only show an average weak correlation of around 0.25 and 0.27, respectively, across all datasets. We found that these findings are consistent with the definition of stress and its relationship with different types of emotions (Mental Health Foundation, 2021; Mayo Clinic, 2021). Even though *Anger* emotion was mentioned in many definitions of stress and stress behavior (MedlinePlus, 2016; Mental Health Foundation, 2021) and (APA, 2022; Mayo Clinic, 2021), it has a weaker correlation with an average of 0.16. This tells us that not all stress-related emotions will appear in social media textual content. Moreover, based on our observations, the average correlations of *Disgust* and *Surprise* to stress are relatively much lower than other emotions.

Table 3: Pearson correlation scores for all features extracted across all datasets. We bold the feature with the most correlation for every feature set for all datasets. The asterisk * features have $p > 0.05$.

Feature/ Dataset		Dreaddit	Twitter Full	Twitter Non-Advert	Reddit Combined	Reddit Title	Absolute Average Correlation r
Sentiment	Negative	0.610	0.513	0.47	0.624	0.766	0.597
	Positive	-0.481	-0.686	-0.696	-0.71	-0.807	0.676
	Neutral	-0.398	0.463	0.444	-0.007*	0.225	0.307
Emotions	Joy	-0.260	-0.582	-0.554	-0.622	-0.664	0.536
	Sadness	0.162	0.258	0.211	0.246	0.402	0.256
	Fear	0.285	0.339	0.360	0.15	0.22	0.271
	Anger	0.107	0.165	0.148	0.121	0.261	0.160
	Disgust	0.061	0.162	0.16	0.100	0.219	0.140
	Surprise	-0.082	-0.049	-0.102	-0.131	-0.117	0.096
Toxicity	Insult	0.089	0.102	0.090	0.085	0.125	0.098
	Obscene	0.151	0.079	0.047	0.123	0.131	0.106
	Threat	0.058	0.044	0.046	0.057	0.121	0.065
	Severe Toxicity	0.085	0.052	0.0278*	0.067	0.126	0.072
	Identity Attack	0.054	0.056	0.085	0.054	0.038	0.057

Finally, we observe that the toxicity features' presence is mainly in *the Insult* and *Obscene* categories, with an average Pearson correlation of about 0.1, and 0.106, respectively. Nonetheless, other toxicity categories, such as *Threat*, *Severe Toxicity*, and *Identity Attack*, show an average below 0.1 to stress textual content. Despite toxic behavior being linked to stress, as other researchers have suggested (Fan et al., 2021; de Mesquita Neto and Becker, 2018; Emmerich et al., 2020), we observe a weak correlation between stress and toxicity. Consequently, indicating that a stressed person does not necessarily exhibit toxic behavior.

To summarize, the correlation coefficients were statistically significant, revealing that Positive and Negative sentiments and the emotions of (joy, sadness, and fear) are essential features for stress detection. Moreover, contradictory to what has been stated in stress and stress behavior definitions and related works, the anger emotions and toxicity features show a much weaker correlation to stress. This indicates that a stressed person does not always exhibit toxic behavior.

6. Conclusion and future work

Stress is crucial to detect with all means possible. Stress in social media can be detected more accurately if we include meaningful features. Our approach of using toxicity and emotional features in addition to the sentiment features shows potential compared to the baselines. Although including emotion and toxicity features improve stress detection, the performance difference indicates there is still room for improvement. We have shown that in a subset of features, such as positive and negative sentiment, the emotion of joy correlates mostly with stress. On top of that, some emotions, such as sadness and fear, have a weak to moderate correlation to stress. Moreover, based on the previously mentioned stress definitions and behaviors, the anger emotion should significantly correlate to stress. However, our observation is that anger emotion only shows a low correlation to stress. Similarly, related works claim stress and toxicity behavior are linked, yet we observe toxicity features having a weaker correlation than previously mentioned features.

A limitation we faced was finding a fairground to compete with pre-trained transformer baselines. As we have mentioned, our approach achieved competitive performance results. We stipulate that by fusing our acquired features with textual embedding, we can achieve greater accuracy and F1 scores. Nonetheless, that can be a future project to create a robust, generalizable stress classifier. Moreover, the bias in data selection might affect the toxicity and stress relationship analysis. For instance, there is a potential that the posts expressing stress in a toxic manner were not collected nor permitted to remain on the social media platform due to possibly violating community guidelines or being too toxic (Twitter Help Center, 2019; Reddit, 2019).

An interesting future direction is to explore classification bias and generalizability. Previous studies have shown that bias and generalizability are connected, and debiasing machine learning and deep learning models can lead to more generalization (Chuang, 2021). Additionally, we plan to explore some aspects of stylometry (writing style of the user), such as punctuation, as seen in the work of (Karami, 2022) but in the context of stress detection.

Acknowledgment:

This work was supported by the Office of Naval Research under Award No. N00014-21-1-4002. Opinions, interpretations, conclusions, and recommendations are those of the authors.

References

- Almerekhi, H., Kwak, H., Salminen, J. and Jansen, B.J., 2020, April. Are these comments triggering? predicting triggers of toxicity in online discussions. In *Proceedings of The Web Conference 2020* (pp. 3033-3040).
- Amazon Mechanical Turk (2018). Amazon mechanical turk. [online] Mturk.com. Available at: www.mturk.com/.
- Apa.org. (2022). Stress in America 2022. [online] Available at: <https://www.apa.org/news/press/releases/stress/2022/concerned-future-inflation>.
- Butt, S., Sharma, S., Sharma, R., Sidorov, G. and Gelbukh, A., 2022. What goes on inside rumour and non-rumour tweets and their reactions: A Psycholinguistic Analyses. *Computers in Human Behavior*, p.107345.
- Camacho-Collados, J., Rezaee, K., Riahi, T., Ushio, A., Loureiro, D., Antypas, D., Boisson, J., Espinosa-Anke, L., Liu, F., Martínez-Cámara, E. and Medina, G., 2022. Tweetnlp: Cutting-edge natural language processing for social media. *arXiv preprint arXiv:2206.14774*.
- Chong, Y.Y. and Kwak, H., 2022, May. Understanding Toxicity Triggers on Reddit in the Context of Singapore. In *Proceedings of the International AAAI Conference on Web and Social Media* (Vol. 16, pp. 1383-1387).
- Choya, J., Wanga, B., AlShelahia, A. and Saigala, R., 2022. External Forces on Financial Markets: Evidence from the GameStop Short Squeeze and Flash Crash.
- Chuang, Y.S., Gao, M., Luo, H., Glass, J., Lee, H.Y., Chen, Y.N. and Li, S.W., 2021, August. Mitigating Biases in Toxic Language Detection through Invariant Rationalization. In *Proceedings of the 5th Workshop on Online Abuse and Harms (WOAH 2021)* (pp. 114-120).
- de Mesquita Neto, J.A. and Becker, K., 2018. Relating conversational topics and toxic behavior effects in a MOBA game. *Entertainment computing*, 26, pp.10-29.
- Devlin, J., Chang, M.W., Lee, K. and Toutanova, K., 2019, January. BERT: Pre-training of Deep Bidirectional Transformers for Language Understanding. In *NAACL-HLT* (1).
- Ekman P., "An argument for basic emotions," *Cognition and Emotion*, vol. 6, no. 3–4, pp. 169–200, May 1992,
- Emmerich, K., Krekhov, A. and Krüger, J., 2020, November. "Pls Uninstall" On the Interplay of the COVID-19 Pandemic and Toxic Player Behavior in Competitive Gaming. In *Extended Abstracts of the 2020 Annual Symposium on Computer-Human Interaction in Play* (pp. 224-228).
- Fan, H., Du, W., Dahou, A., Ewees, A.A., Yousri, D., Elaziz, M.A., Elsheikh, A.H., Abualigah, L. and Al-qaness, M.A., 2021. Social media toxicity classification using deep learning: Real-world application uk brexit. *Electronics*, 10(11), p.1332.
- F. Barbieri, J. Camacho-Collados, L. Neves, and L. Espinosa-Anke. Twitter-roberta-base for sentiment analysis. <https://huggingface.co/cardiffnlp/twitter-roberta-basesentiment>, 2020..
- Hanu, L., 2020. Unitary team. Detoxify. Github. <https://github.com/unitaryai/detoxify>.
- Hartmann, J. (2022) Emotion English DistilRoBERTa-base. Available at: <https://huggingface.co/j-hartmann/emotion-english-distilroberta-base/>.
- Hoang, P.G., Nguyen, L.T. and Nguyen, K., 2021, August. UIT-E10dot3 at SemEval-2021 Task 5: Toxic Spans Detection with Named Entity Recognition and Question-Answering Approaches. In *Proceedings of the 15th International Workshop on Semantic Evaluation (SemEval-2021)* (pp. 919-926).
- Ji, S., Zhang, T., Ansari, L., Fu, J., Tiwari, P. and Cambria, E., 2021. Mentalbert: Publicly available pretrained language models for mental healthcare. *arXiv preprint arXiv:2110.15621*.
- Karami, M., Mosallanezhad, A., Mancenido, M. V., & Liu, H. 2022. "Let's Eat Grandma": Does Punctuation Matter in Sentence Representation?.
- Lazarus, R. S. (2006). *Stress and emotion: A new synthesis*. Springer Publishing Company.

- Matos, B., Lima, R.C., Almeida, J.M., Gonçalves, M.A. and Santos, R.L., 2022. On the Presence of Abusive Language in Mis/Disinformation. In the International Conference on Social Informatics (pp. 292-304). Springer, Cham.
- Mayo Clinic (2021). Stress Management. [online] Mayo Clinic. Available at: www.mayoclinic.org/healthy-lifestyle/stress-management/in-depth/stress-symptoms/art-20050987.
- Mauriello, M.L., Lincoln, T., Hon, G., Simon, D., Jurafsky, D. and Paredes, P., 2021, May. Sad: A stress annotated dataset for recognizing everyday stressors in sms-like conversational systems. In Extended abstracts of the 2021 CHI conference on human factors in computing systems (pp. 1-7).
- Medina, G.M., Collados, J.C. and Cámara, E.M., 2022. NLP4SM: Natural Language Processing for social media.
- MedlinePlus (2016). Stress and your health. [online] Medlineplus. Available at: <https://medlineplus.gov/ency/article/003211.htm>.
- Mental Health Foundation (2021). Stress. [online] www.mentalhealth.org.uk. Available at: <https://www.mentalhealth.org.uk/explore-mental-health/a-z-topics/stress>.
- Naseem, U., Lee, B.C., Khushi, M., Kim, J. and Dunn, A., 2022, May. Benchmarking for Public Health Surveillance tasks on Social Media with a Domain-Specific Pretrained Language Model. In Proceedings of NLP Power! The First Workshop on Efficient Benchmarking in NLP (pp. 22-31).
- Rastogi, A., Liu, Q. and Cambria, E., 2022, July. Stress Detection from Social Media Articles: New Dataset Benchmark and Analytical Study. In 2022 International Joint Conference on Neural Networks (IJCNN) (pp. 1-8). IEEE.
- Reddit (2019). Content Policy - Reddit. [online] [Redditinc.com](https://www.redditinc.com/policies/content-policy). Available at: <https://www.redditinc.com/policies/content-policy>.
- Rozado, D., Hughes, R. and Halberstadt, J., 2022. Longitudinal analysis of sentiment and emotion in news media headlines using automated labelling with Transformer language models. Plos one, 17(10), p.e0276367.
- Shao, R., Shi, Z. and Zhang, D., 2021. Social media and emotional burnout regulation during the COVID-19 pandemic: multilevel approach. Journal of Medical Internet Research, 23(3), p.e27015.
- Sravanthi, T., Hema, V., Reddy, S.T., Mahender, K. and Venkateshwarlu, S., 2020, December. Detection of Mentally Distressed Social Media Profiles Using Machine Learning Techniques. In IOP Conference Series: Materials Science and Engineering (Vol. 981, No. 2, p. 022056). IOP Publishing.
- Thelwall, M., 2017. TensiStrength: Stress and relaxation magnitude detection for social media texts. Information Processing & Management, 53(1), pp.106-121.
- Turcan, E. and Mckeown, K., 2019, November. Dreddit: A Reddit Dataset for Stress Analysis in Social Media. In Proceedings of the Tenth International Workshop on Health Text Mining and Information Analysis (LOUHI 2019) (pp. 97-107)..
- Twitter Help Center (2019). The Twitter Rules. [online] [Twitter.com](https://help.twitter.com/en/rules-and-policies/twitter-rules). Available at: <https://help.twitter.com/en/rules-and-policies/twitter-rules>.
- Yaribeygi, H., Panahi, Y., Sahraei, H., Johnston, T.P. and Sahebkar, A., 2017. The impact of stress on body function: A review. EXCLI journal, 16, p.1057.

Appendix:

Table A.1: Additional detailed results comparing multiple classification algorithms
(Gradient boosting= GB, random-forest=RF, Multi-layer Perceptron= MLP, ADA boosting= ADAB, XGboost= XGB)

Feature set / Accuracy	GB	RF	MLP	ADAB	XGB	GB	RF	MLP	ADAB	XGB
	Dreadit					Reddit title				
Toxicity features	68.44	66.31	61.17	68.26	69.5	71.13	67.33	56.56	65.16	67.78
Emotional features	75.35	74.11	78.01	74.11	74.82	89.14	89.32	88.24	88.33	88.6
Sentiment features	81.56	76.42	80.5	79.96	81.21	90.59	89.14	90.23	90.59	90.5
Toxicity, Emotional features	77.13	75.35	74.82	76.42	76.42	90.11	89.32	88.42	88.96	89.5
Sentiment, Emotional features	80.32	80.14	81.21	79.43	80.67	91.49	91.49	91.86	91.04	91.76

Feature set / Accuracy	<i>GB</i>	<i>RF</i>	<i>MLP</i>	<i>ADAB</i>	<i>XGB</i>	<i>GB</i>	<i>RF</i>	<i>MLP</i>	<i>ADAB</i>	<i>XGB</i>
	<i>Dreadit</i>					<i>Reddit title</i>				
Toxicity features	68.44	66.31	61.17	68.26	69.5	71.13	67.33	56.56	65.16	67.78
Emotional features	75.35	74.11	78.01	74.11	74.82	89.14	89.32	88.24	88.33	88.6
Sentiment features	81.56	76.42	80.5	79.96	81.21	90.59	89.14	90.23	90.59	90.5
Toxicity, Emotional features	77.13	75.35	74.82	76.42	76.42	90.11	89.32	88.42	88.96	89.5
Sentiment, toxicity features	81.21	80.14	80.32	79.79	80.67	91.68	91.04	91.04	90.68	91.4
All features	82.37	80.67	80.32	78.19	81.21	92.04	91.58	91.67	92.04	92.58

Feature set / Accuracy	<i>GB</i>	<i>RF</i>	<i>MLP</i>	<i>ADAB</i>	<i>XGB</i>	<i>GB</i>	<i>RF</i>	<i>MLP</i>	<i>ADAB</i>	<i>XGB</i>
	<i>Twitter non-advert</i>					<i>Reddit combi</i>				
Toxicity features	68.1	65.57	57.72	66.33	66.33	87.84	87.2	87.68	87.2	88.0
Emotional features	81.27	80.25	79.75	80.51	81.01	91.04	91.36	91.84	92.48	91.85
Sentiment features	80.51	78.67	81.4	81.28	81.16	91.52	91.2	92.16	91.52	91.04
Toxicity, Emotional features	82.28	79.75	80.25	81.52	81.77	91.68	92.0	92.32	92.16	91.84
Sentiment, Emotional features	83.8	84.56	84.56	81.77	83.54	92.16	92.8	93.6	92.16	92.8
Sentiment, toxicity features	81.27	81.77	82.53	80.76	82.03	92.03	91.68	92.48	91.04	91.2
All features	85.06	84.3	85.06	83.29	83.8	92.96	92.48	93.28	92.32	92.0

Communication Beyond COVID-19 of Portuguese Health Entities Through Social Media

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Abstract: Health communication is critical for achieving positive clinical health outcomes. This work aims to analyse how Portuguese health entities communicated non-COVID-19 health content with the public on social media, during the COVID-19 pandemic. A retrospective study was conducted on the Portuguese National Healthcare Service's communication with the public using social media platforms. Data from the National Health Service (NHS) and Directorate-General of Health (DGS) posts of the year 2020 were collected from Facebook, Instagram, and Twitter. A thematic analysis of all non-COVID-19-related posts was conducted, and the engagement (E) of the public was calculated. The most frequently published subject on social media platforms by NHS and DGS were "Commemorative Dates" (34.87%), "Miscellaneous" (19.95%), and "Emergency Preparedness and Response" (19.85%). On the NHS social media platforms, the posts with the highest public engagement were "Innovation" (E=926.0) on Instagram; "Vaccines, and Immunization" (E=577.9) on Facebook; and "Commemorative Dates" (E=23.0) on Twitter. DGS posts with the highest engagement of the public on all social media platforms were "Emergency Preparedness and Response" (E=2294.1) on Facebook; "Commemorative Dates" (E=122.5) on Instagram; and "Infant and Child Health" (E=107.7) on Twitter. The findings indicate that during the COVID-19 pandemic, the Portuguese National Healthcare communicated beyond COVID-19 disease.

Keywords: Communication; Engagement; Health Entities; Social Media; Social Networks

1. Introduction

Health communication is an important strategy for the improvement of health literacy and is essential to the promotion of population health and to achieving good clinical health outcomes. According to the Centers for Disease Control and Prevention (CDC) Social Media Tools, Guidelines & Best Practices, *"the use of social media tools is a powerful channel to reach target audiences with strategic, effective, and user-centric health interventions"* (Centers for Disease Control and Prevention, 2021).

At the beginning of 2020, the coronavirus disease (COVID-19) pandemic conducted a massive flow of health information with 24/7 news coverage (Finset et al., 2020). This massive flow of health information and perspectives on the pandemic was unprecedented and diverse and, with the pandemic development, has become obvious the need to provide clear, honest, and valid information to the public all over the world (Finset et al., 2020).

Portugal was not an exception, and during the first year of COVID-19 health entities increased their presence on social media platforms, but the COVID-19 content of the publications was not in line with the interest of the public (Azevedo et al., 2022).

Portuguese National Healthcare Service is public and free and was considered one of the bests healthcare services in the world (World Population Review, 2022). Even so, the lack of communication was identified as a gap that can compromise the management of non-communicable diseases (Plácido et al., 2020, Plácido et al., 2021). Furthermore, restrictions related to the COVID-19 pandemic, compromise the traditional channels of communication, and hamper the communication of the National Healthcare Service with the public. Considering that ensuring control of non-communicable diseases and risk factors is essential to maintaining the well-being of the population and that some non-communicable diseases increase the risk of developing severe or even fatal COVID-19 (World Health Organization, 2020a), this work aims to retrospectively analyse the communication beyond COVID-19 of Portuguese public health entities with the public using social media platforms.

2. Materials and Methods

2.1 Study Design and Data Source

The main authority on health in Portugal is the National Healthcare Service (NHS), which has the Directorate-General of Health (DGS) under its authority and direct administration (National Health Service, 2021). The official accounts on Facebook, Instagram, and Twitter of the NHS¹²³ and DGS⁴⁵⁶ were accessed between 1st January 2020 and 31st December 2020. Data regarding the existence, use, and engagement of users were collected. The official websites of the health entities were provided by the NHS website (National Health Service, 2021).

2.2 Data Collection

All NHS and DGS posts published between 1st January 2020 and 31st December 2020 on each social media platform (Facebook, Instagram, and Twitter) were retrieved and analysed following the methodology described by Azevedo et al. (2022). Data collection from posts was stratified by the entity and by social network platform and these were soon divided into COVID-19-related or non-COVID-19-related posts. Non-COVID-19-related posts group was also classified according to the type of post it and additionally, the number of reactions that each publication triggered was also collected (Figure 1).

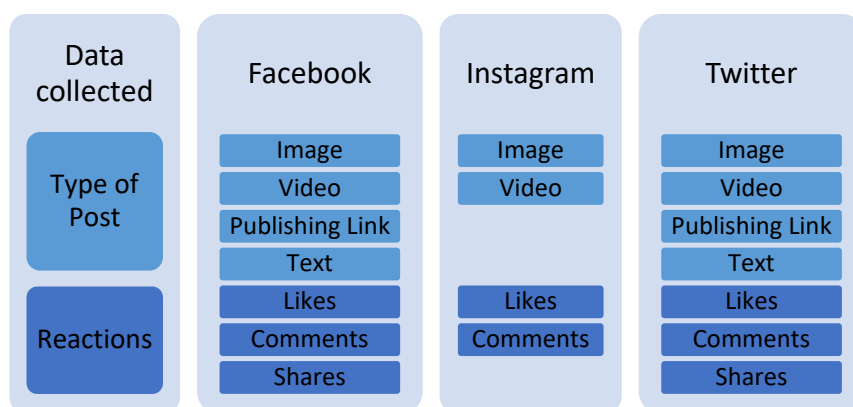


Figure 1: Data collected from the posts of the health entities' official social media accounts on the platforms under analysis.

The analysis of the user interaction enabled the assessment of the engagement (E) of the public with the social media platforms of NHS and DGS was calculated following the methodology reported by Azevedo et al. (2022).

2.3 Thematic Analysis

The communication of health entities on social media platforms was explored using a thematic analysis in accordance with Braun and Clarke (2006). Briefly, after a repeated and detailed reading of the content of all non-COVID-19-related posts by two independent researchers (D.A. and A.I.P) and with the support of the literature (Bhattacharya et al., 2017, Al et al., 2019, Loss and von Uslar, 2021, Jha et al., 2016), an initial "coding concept" was created. Then, the initial codes were accurately analyzed by the research team and revised following the strategy used by Jha et al. (2016) and the final categorization emerged (Table 1).

3. Results

3.1 Health Entities and Social Media Accounts

It was observed that NHS and DGS expressed a preference for Twitter (Table 1). During the study period, less than 38% of the total posts published by NHS and DGS were non-COVID-19-related themes.

¹ NHS Facebook - <https://www.facebook.com/sns.gov.pt>

² NHS Instagram - https://www.instagram.com/sns_pt/

³ NHS Twitter - https://twitter.com/SNS_Portugal

⁴ DGS Facebook - <https://www.facebook.com/direcaogeralssaude/>

⁵ DGS Instagram - https://www.instagram.com/direcao_geral_saude/

⁶ DGS Twitter - <https://twitter.com/DGSAude>

Table 1: Total posts published in 2020 by health entities on their official accounts on social media platforms.

		Posts published in 2020				Total of posts (number)
		COVID-19-related posts		Non-COVID-19-related posts		
		number	percentage	number	percentage	
NHS	Facebook	658	67.77%	313	32.23%	971
	Instagram	783	62.99%	460	37.01%	1243
	Twitter	1471	64.29%	817	35.71%	2288
	Total	2912	64.68%	1590	35.32%	4502
DGS	Facebook	459	84.84%	82	15.16%	541
	Instagram	480	74.19%	167	25.81%	647
	Twitter	565	83.58%	111	16.42%	676
	Total	1504	80.69%	360	19.31%	1864

DGS - Directorate-General of Health; NHS - National Health Service

3.2 Thematic Analysis

Table 2 describes the health communication categories that emerged from the thematic analysis of all non-COVID-19-related posts. The categories “Commemorative Dates”, “Miscellaneous”, and “Emergency Preparedness and Response” were the most reported on the global of the three social media platforms of both health entities, with a post percentage of 34.87%, 19.95%, and 19.85%, respectively. In opposition, the category “Chronic Disease” was the one that presented the lowest post percentage with only 0.05% of the posts (data not shown).

3.2.1 National Health Service

In health communication through social media platforms, NHS adopted virtually the same post preferences on Facebook, Instagram, and Twitter, with the three most commonly used common categories being “Miscellaneous” (F=30.35%, I=11.96%, and T=26.44%), “Commemorative Dates” (F=26.20%, I=43.70%, and T=26.68%) and “Emergency Preparedness and Response” (F=15.65%, I=28.04%, and T=16.65%) (Table 3). Among the emerging categories, “Infant and Child Health” and “Smoking and Tobacco use” were the ones that, simultaneously on the three platforms, presented a residual percentage of posts, not reaching even 1% of posts each (Table 3).

Regarding public engagement achieved by NHS posts, on Facebook, the categories that generated greater public engagement were “Vaccines and Immunization” (E=577.9) and “Healthy Living” (E=528.5), on the other hand, lower public engagement was associated with posts from “Women’s Health” (E=51.0) and “Injury and Violence” (E=70.0) categories (Table 3). On Instagram, “Innovation” and “Smoking and Tobacco use” were the categories responsible for the highest public engagement (E=926.0 and E=912.3, respectively), while “Communicable Diseases” was the category that triggered the lowest public engagement (E=147.0) (Table 3). On Twitter, greater public engagement resulted from posts in the “Commemorative Dates” and “Healthy Living” categories (E=23.0 and E=22.1, respectively), and lower public engagement occurred in the “Women’s Health” category (E=0.7) (Table 3).

On Facebook, in the set of all categories, the types of posts favored by the SNS were publishing links and images in 56.23% and 42.81% of posts, respectively, to the detriment of video, which was only used in 0.96% of posts, and the text, which was not part of the SNS choices in any of its publications. Although the SNS, on Facebook, made the most posts in the set of all categories through publishing links, it was the video and image posts that generated the most public engagement (E=354.0 and E=346.7, respectively) (data not shown).

On Instagram, in the set of all categories, the type of post privileged by the SNS was the image in 90.69% of the posts, to the detriment of the video, which was only used in 9.31% of the posts. In addition to the SNS having made most of its posts in images, this type of publication also always triggered greater public engagement (data not shown).

On Twitter, in the set of all categories, the post type preference order adopted by the SNS in its posts was the image (78.58%), publishing link (17.63%), text (2.69%), and video (1.10%). Although SNS video posts on Twitter are a minority (1.10%), they were the ones that generated the most public engagement (E=99.1) (data not shown).

3.2.1 Directorate-General of Health

In health communication through social media platforms, DGS adopted practically the same post preferences on Facebook, Instagram, and Twitter with the two most used common categories being “Commemorative Dates” (F=71.95%, I=47.90%, and T=36.04%) and “Emergency Preparedness and Response” (F=10.98%, I=28.14%, and T=15.32%) (Table 3).

Table 2: Emerged health communication categories from health entities' posts on Facebook, Instagram, and Twitter social media platforms.

Health communication categories	Main subcategories encompassed	Coding concepts	Quotes
Cancer Prevention	- Breast cancer - Familial cancer - Cancer patients	Screening, investigation of new genetic alterations, and new services for cancer patients.	<i>"Researchers from the Portuguese Institute of Oncology in Lisbon have identified new genetic alterations in some types of familial cancer, which may be responsible for hereditary cancers in families prone to some of the most aggressive forms of the disease."</i> <i>"The Northern Regional Health Administration will resume the breast cancer screening program."</i>
Chronic Diseases	Cardiovascular diseases	Cardiovascular risk factors.	<i>"Cardiovascular risk factors: Study reveals that more than half of Portuguese are obese or pre-obese."</i>
Communicable Diseases	- HIV/AIDS infections - Viral hepatitis - Sexually Transmitted Diseases	Awareness campaigns, intervention protocols, alerts on transmission and protective measures.	<i>"Condoms protect against HIV and other sexually transmitted infections."</i> <i>"The Doctor Ricardo Jorge National Institute of Health and Loures sign a protocol for intervention in the field of HIV/AIDS."</i>
Drugs and Alcohol	- Excessive alcohol consumption - Addictive behaviors	Awareness campaigns, warning of consequences, and Service for Intervention in Addictive Behaviors and Dependencies (SICAD).	<i>"Want to risk one more drink? The result can be seen... If you drink, don't drive."</i> <i>"Substanceless addictions are increasingly the order of the day. Learn more about gambling, internet and other addictive behaviors at @SICAD_Portugal."</i>
Emergency Preparedness and Response	- Community resilience - General emergency preparedness - Summer and winter preparedness	Recommendations and educational messages. Recognition of signs and symptoms and ways to act in emergency situations. Seasonal Health Contingency Plans.	<i>"Exposure to intense heat can have negative health effects. Take cover!"</i> <i>"Carbon monoxide is a toxic gas that has no smell or color. If you suspect inhalation, call 112."</i> <i>"Be aware of the symptoms. Stroke and heart attack are a reality, call 112 immediately."</i> <i>"Always bear in mind that most fires start with a negligent act. Find out the fire risk for your county at: http://goo.gl/gUhlO9"</i>
Environmental Health	- Environment - Pollution	Campaigns to avoid pollution and care for the environment.	<i>"Government launches campaign to avoid garbage production."</i> <i>"All waste, and especially plastic, lead to record levels of pollution caused by microplastics, which threaten marine species and human health. Always put your rubbish in the proper containers or keep it in a bag until you leave the beach."</i>
Healthy Living	- Healthy community - Living and medical advice - Nutrition and diet - Physical exercise - National Programs for the Promotion of Healthy Eating and Occupational Health	Awareness campaigns and encouraging messages for the demand for primary health care and to go to the emergency room. Educational messages about hydration and healthy eating. Calls for blood donation, antibiotic resistance fighting, salt reduction and physical exercise practice.	<i>"Awareness campaign: 'Help us to take better care of you, trust in Primary Health Care and contribute to reducing waiting times in hospital emergencies'. This is the motto of the campaign developed by Barreiro Montijo Hospital Center."</i> <i>"Your health comes first. If you need it, don't hesitate to seek health care. We are all responsible and must take care of ourselves, our family and friends, contributing to the community. Take care of yourself, take care of everyone!"</i> <i>"Blood donation is probably the biggest solidarity platform, give who can, receive who needs it. Join this noble cause, donate blood. Drop by drop we save lives."</i> <i>"Do not take antibiotics without a prescription."</i> <i>"For your health, cut back on salt."</i> <i>"Did you know that climbing stairs burns up to 7 times more calories than taking an elevator?"</i>
Infant and Child Health	- Emergencies - National Programs	National Neonatal Screening Program and Pediatric Emergency.	<i>"CHBV Pediatric Emergency: Pediatric Emergency resumed within 24 hours from today, July 1st."</i> <i>"National Neonatal Screening Program Take Care of Yourself, Take Care of Everyone!"</i>
Injury and Violence	Violence in the cycle and life, against health professionals and domestic	National prevention campaigns, plans and programs. Calls for participation in cases of	<i>"National Suicide Prevention Campaign: We all have a say in preventing suicide. Be aware of the signs. If someone's life is in danger, call for help immediately."</i> <i>"Domestic violence is a pattern of behavior that must be reported. Call 112 or 800 202 148, or SMS 3060."</i>

Health communication categories	Main subcategories encompassed	Coding concepts	Quotes
	• Suicide	aggression and violence and health security office.	<i>"Creation of the Health Security Office: Measure aims at a more systematic approach to the problems of violence against health professionals."</i>
Mental Health	• DGS National Program for Mental Health	Partnership protocols, disclosure of newsletters, campaigns, documentaries and webinars and home support teams.	<i>"Recommendations for your Mental Health - To better manage your day, your routines and your emotions. A partnership between the Directorate-General for Health and the Order of Portuguese Psychologists. Take care of yourself, take care of everyone!"</i> <i>"Watch the documentary: "Depression", from the campaign 'Let's Talk' sponsored by DGS - National Mental Health Program Cultural Forum of Alcochete."</i> <i>"Review process of the Mental Health Law already underway."</i> <i>"Creation of the first three home support teams in Alentejo."</i>
Miscellaneous		Promotion and Announcements of awards, contests, training, careers and recruitment. Disclosure of the 2020 State Budget, investments and reinforcements, openings and ceremonies and visits by government entities. Interesting information about SNS24, INEM and the rights, support and benefits of the Informal Caregiver.	<i>"SPMS wins Marketeer 2020 Award with the brand SNS 24."</i> <i>"Special Career in Nursing: Ordinance published with requirements for the recruitment contest."</i> <i>"Disease prevention and health promotion are priority areas in the National Health Service."</i> <i>"Reinforcement in the area of Health: Supplementary budget foresees a reinforcement of 504 million."</i> <i>"Prime Minister and Minister of Health inaugurate hospitalization and visit works of the Rehabilitation Plan of Centro Hospitalar Gaia Espinho (CHVNGE)."</i> <i>"INEM Poison Control Information: 2,288 telephone inquiries were made in the field of toxicology in June."</i> <i>"Caregivers and people cared for can now consult their rights and benefits, support measures and services, as well as responses at various levels in ePortugal."</i>
Smoking and Tobacco use	• Fight against smoking	Awareness campaigns and educational messages.	<i>"The importance of @who's SPEAK OUT #TobaccoExposed campaign aims to reinforce effective policy interventions in the fight against tobacco, expose industry tactics, inform young people about the intentions and tactics of the tobacco industry to capture them as new consumers and empower tobacco influencers young people to warn and defend them."</i> <i>"Quitting smoking is the best decision a smoker can make to improve their health and the health of those around them."</i> <i>"To have a healthy lung, have healthy lifestyle habits, such as not smoking. Protect yourself for your health."</i>
Vaccines and Immunization	• National Vaccination Program • Seasonal flu vaccination • Pneumococcal vaccine	New scheme of NVP, DGS annual rule on vaccination and ways to consult vaccines bulletin. Appeals and advice not to delay vaccination.	<i>"Consult the new scheme of the National Vaccination Program."</i> <i>"Vaccination is a priority public health measure - be sure to vaccinate your children. If you are pregnant or belong to a risk group, do not delay your usual vaccinations."</i> <i>"Do not postpone vaccination in any way", warns the Director-General of Health".</i> <i>"Vaccines 4 ways to consult your vaccine bulletin."</i>
Women's Health	• Female Genital Mutilation	Prevention and combat collaboration protocols, statements by the Secretary of State for Health and alerts to physical, mental and economic costs.	<i>"Lisbon and Tagus Valley Regional Health Administration signs two collaboration protocols within the scope of Preventing and Combating Female Genital Mutilation."</i> <i>"World Health Organization (WHO) warns of the physical, mental and economic costs of female genital mutilation."</i>
Logistic		Reinforcement of human resources, means of diagnosis, medical units, assistance and clinical activity, fleet of ambulances, emergency means, work teams and infrastructure.	<i>"Reinforcement of Human Resources: ARSLVT with more than 1,249 professionals in the health centers."</i> <i>"Investment for the Endoscopic Techniques Unit."</i> <i>"Resumption of care activity: Centro Hospitalar do Médio Tejo with more consultations, surgeries and consultations."</i> <i>"Investment in 107 new ambulances to reinforce the fleet."</i> <i>"Medicines Availability management: Platform for notifying drug shortages came into force."</i> <i>"Infarmed Medical devices: New information system is now available."</i>

Health communication categories	Main subcategories encompassed	Coding concepts	Quotes
		New platforms and information systems. Increased transplants and reduced waiting lists.	
Commemorative Dates		Marking commemorative days, weeks or months (worldwide, international, European, national, etc.) and anniversaries.	<i>"European Day of 112: INEM calls on citizens to collaborate with the authorities in an emergency."</i> <i>"April: International Child Abuse Prevention Month! Take care of yourself, take care of everyone!"</i> <i>"SNS 24 celebrates three years today! Remember: even on special days, SNS 24 is always available!"</i>
Innovation	- Innovative techniques, treatments, drugs, procedures, equipment and approaches - Research, projects and discoveries	Innovative: transplants, therapeutics, drug processes and mechanisms. Home Hospitalization, mobile applications, Musculoskeletal Tissue Bank and Integrated Responsibility Center. Pioneering approaches and discovery of new mechanisms.	<i>"CHULN pioneers an amniotic membrane transplant to close a hole in the retina."</i> <i>"S. João implants a long-term neurostimulator in an epileptic patient."</i> <i>"CHVNG/E implements anesthetic gas capture and recycling project."</i> <i>"Infarmed, I.P. completed 27 innovative drug processes in 2020."</i> <i>"New technique allows reduction of invasive procedures and hospitalization."</i> <i>"First Integrated Responsibility Center for Urology in the Lisbon and Tagus Valley region."</i> <i>"New space in São João: CHUSJ starts the activity of the Musculoskeletal Tissue Bank."</i> <i>"New glucose uptake mechanism discovered."</i> <i>"WHO launches mobile application to help detect hearing loss. INSA proposes a pioneering approach in the control of rare genomic diseases."</i>

Among the emerging categories, "Injury and Violence" presented, simultaneously on Instagram and Twitter, a residual percentage of posts, not reaching even 1% of posts in each (Table 3).

Regarding public engagement achieved by DGS posts, on Facebook and Instagram platforms, the categories with the highest percentages of posts were also those that originated the greatest public engagement (Table 3). On Twitter, the category that generated the most public engagement was "Infant and Child Health" (E=107.7), while the lowest public engagement was associated with posts in the "Logistic" category (E=22.0) (Table 3). The categories "Mental Health", on Instagram, and "Healthy Living", on Facebook, were the ones that triggered the lowest public engagement (E=53.5 and E=296.5, respectively) (Table 3).

On Facebook, in the set of all categories, the type of post favored by the DGS was the image in 86.59% of the publications, to the detriment of the publishing link and video, used in 9.76% and 3.66% of posts respectively, and text, which was not part of the DGS choices in any of its posts. Although the DGS, on Facebook, made most of the posts in the set of all categories in image, it was the publishing link posts that generated the greatest public engagement (E=5368.8) (data not shown).

On Instagram, in the set of all categories, the type of post favored by the DGS was the image in 96.45% of the posts, to the detriment of the video, which was only used in 3.55% of the posts. On Instagram, in addition to the fact that DGS made most of its posts in images, this type of post also triggered greater public engagement (data not shown).

On Twitter, in the set of all categories, the order of preference of the type of post adopted by the DGS in its posts was the image (81.08%), text (12.61%), publishing link (5.41%), and video (0.90%). Despite the DGS text posts on Twitter representing only 12.61% of its posts, they were the ones that generated the greatest public engagement (E=63.6) (data not shown).

Table 3: Emerged categories percentage and interaction from the Health Entities' posts on Facebook, Instagram, and Twitter.

		NHS			DGS		
		Facebook	Instagram	Twitter	Facebook	Instagram	Twitter
Cancer Prevention	%	0.64%	-	0.61%	-	-	-
	Interaction	477.5	-	5.8	-	-	-
Chronic Diseases	%	0.32%	-	-	-	-	-
	Interaction	152.0	-	-	-	-	-
Communicable Diseases	%	-	0.43%	0.61%	1.22%	-	-
	Interaction	-	147.0	4.2	416.0	-	-
Drugs and Alcohol	%	-	0.43%	0.98%	-	-	-
	Interaction	-	776.5	9.0	-	-	-
Emergency Preparedness and Response	%	15.65%	28.04%	16.65%	10.98%	28.14%	15.32%
	Interaction	159.3	428.5	10.7	2294.1	86.3	43.9
Environmental Health	%	-	0.22%	0.24%	-	0.60%	-
	Interaction	-	758.0	12.5	-	62.0	-
Healthy Living	%	2.56%	8.91%	5.75%	2.44%	3.59%	7.21%
	Interaction	528.5	558.7	22.1	296.5	109.8	54.3
Infant and Child Health	%	0.64%	0.22%	0.37%	-	1.80%	2.70%
	Interaction	133.0	291.0	2.7	-	62.3	107.7
Injury and Violence	%	0.32%	1.09%	0.86%	-	0.60%	0.90%
	Interaction	70.0	655.2	19.0	-	99.0	65.0
Mental Health	%	1.28%	0.65%	0.86%	2.44%	1.20%	3.60%
	Interaction	85.5	872.7	5.7	324.0	53.5	23.3
Miscellaneous	%	30.35%	11.96%	26.44%	6.10%	4.19%	9.91%
	Interaction	91.4	421.2	5.4	1316.6	115.0	56.5
Smoking and Tobacco use	%	0.32%	0.65%	0.73%	-	0.60%	-
	Interaction	106.0	912.3	7.0	-	55.0	-
Vaccines and Immunization	%	3.19%	2.39%	2.20%	4.88%	11.38%	23.42%
	Interaction	577.9	615.1	12.8	1056.5	111.2	37.5
Women's Health	%	0.32%	-	0.37%	-	-	-
	Interaction	51.0	-	0.7	-	-	-
Logistic	%	12.46%	1.09%	13.10%	-	-	0.90%
	Interaction	91.1	461.0	4.1	-	-	22.0
Commemorative Dates	%	26.20%	43.70%	26.68%	71.95%	47.90%	36.04%
	Interaction	390.1	498.8	23.0	1884.3	122.5	34.0
Innovation	%	5.75%	0.22%	3.55%	-	-	-
	Interaction	173.1	926.0	4.8	-	-	-
Total of categories	%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	Interaction	214.4	614.2	12.0	1759.6	107.4	41.8

DGS - Directorate-General of Health; NHS - National Health Service

4. Discussion

This study analyses for the first time how the Portuguese national health entities NHS and DGS communicated, during the first year of COVID-19, themes non-related to COVID-19.

Social media platforms emerged as a natural patient-healthcare services facilitator during the COVID-19 pandemic. The advantage of social media platforms to strengthen patient-healthcare professionals' communication and consequently improved health outcomes has been described years before the COVID-19 pandemic (Gunasekaran et al., 2022). The usefulness of these platforms is associated with the opportunity to disseminate information in a short period to a high number of users. Previous studies have demonstrated that social media platforms can be powerful tools in the achievement of national healthcare goals, for example during the smoking cessation and cancer prevention campaigns social media platforms proved very effective (Lenoir et al., 2017, Naslund et al., 2017).

Although the management of cancer and other chronic diseases has been considered essential to ensure health and economic outcomes, and chronic diseases and cancer have been associated with severe cases of COVID-19 diseases (World Health Organization, 2020a), themes related to non-communicable diseases and their prevention were associated with a low number of posts. This observation suggests that non-COVID-19-related themes were not prioritized which is in line with a study conducted by the World Health Organization in 155 countries that highlighted a major disruption in the management of the noncommunicable disease and their risk factors (World Health Organization, 2020b) which negatively impact the well-being of the frailty populations (Wong et al., 2020). Although the themes associated with the management and prevention of chronic diseases and the promotion of healthy living reached a high public engagement, this type of content was associated with a low number of publications suggesting that the posts of health entities were not in line with the public interest.

Otherwise, the most published themes, “Commemorative Dates”, “Miscellaneous” and “Emerging Preparedness and Response” presented low public engagement. This lack of concordance between publications and public interactions suggested that public health entities should rethink their performance in social media to maximize the use of social media platforms (Azevedo et al., 2022). Moreover, the few numbers of posts related to the management and prevention of non-communicable diseases can be associated with the increased number of patients with unstable chronic diseases.

This study provides data to health stakeholders to rethink the strategies used to manage non-communicable diseases through the utilization of social media platforms and highlights the need of developing new strategic approaches.

Although the relevant data provided by this study, some limitations must highlight namely the short period of the COVID-19 pandemic covered and the lack of socio-demographic profiles of the social media users.

5. Conclusions

During the COVID-19 pandemic, the Portuguese National Healthcare communicated beyond COVID-19 disease, but the prevention and management of non-communicable diseases was not relevant, suggesting a possible disruption in the management of non-communicable diseases.

References

- Azevedo, D., Placido, A. I., Herdeiro, M. T., Roque, F. & Roque, V. (2022) 'How Portuguese Health Entities Used Social Media to Face the Public Health Emergency during COVID-19 Disease'. *Int J Environ Res Public Health*, 19.
- Bhattacharya, S., Srinivasan, P. & Polgreen, P. (2017) 'Social media engagement analysis of U.S. Federal health agencies on Facebook'. *BMC Med Inform Decis Mak*, 17, 49.
- Braun, V., & Clarke, V. (2006) 'Using thematic analysis in psychology'. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp0630a>
- Centers for Disease Control and Prevention. (2021) 'CDC Social Media Tools, Guidelines & Best Practices' [Online]. Available: <https://www.cdc.gov/socialmedia/tools/guidelines/index.html> [Accessed 28th november 2022].
- Finset, A., Bosworth, H., Butow, P., Gulbrandsen, P., Hulsman, R. L., Pieterse, A. H., Street, R., Tschoetschel, R. & Van Weert, J. (2020) 'Effective health communication - a key factor in fighting the COVID-19 pandemic'. *Patient Educ Couns*, 103, 873-876.
- Gunasekaran, D. V., Chew, A., Chandrasekar, E. K., Rajendram, P., Kandarpa, V., Rajendram, M., Chia, A., Smith, H. & Leong, C. K. (2022) 'The Impact and Applications of Social Media Platforms for Public Health Responses Before and During the COVID-19 Pandemic: Systematic Literature Review'. *J Med Internet Res*, 24, e33680.
- Jha, A., Lin, L. & Savoia, E. (2016) 'The Use of Social Media by State Health Departments in the US: Analyzing Health Communication Through Facebook'. *J Community Health*, 41, 174-9.
- Lenoir, P., Moulahi, B., Aze, J., Bringay, S., Mercier, G. & Carbonnel, F. (2017) 'Raising Awareness About Cervical Cancer Using Twitter: Content Analysis of the 2015 #SmearForSmear Campaign'. *J Med Internet Res*, 19, e344.
- Loss, J. & von Uslar, C. (2021) 'How German health insurance providers use social online networks to promote healthy lifestyles: a content analysis of Facebook(R) accounts'. *BMC Med Inform Decis Mak*, 21, 64.
- Naslund, J. A., Kim, S. J., Aschbrenner, K. A., McCulloch, L. J., Brunette, M. F., Dallery, J., Bartels, S. J. & Marsch, L. A. (2017) 'Systematic review of social media interventions for smoking cessation'. *Addict Behav*, 73, 81-93.
- National Health Service. (2021) 'Health Entities - SNS' [Online]. Available: <https://www.sns.gov.pt/entidades-de-saude/direcao-geral-da-saude/> [Accessed 28th December 2021 2021].
- Placido, A. I., Herdeiro, M. T., Simoes, J. L., Amaral, O., Figueiras, A. & Roque, F. (2020) 'Voices of Polymedicated Older Patients: A Focus Group Approach'. *Int J Environ Res Public Health*, 17.
- Placido, A. I., Herdeiro, M. T., Simoes, J. L., Amaral, O., Figueiras, A. & Roque, F. (2021) 'Health professionals perception and beliefs about drug-related problems on polymedicated older adults- a focus group study'. *BMC Geriatr*, 21, 27.
- Rahim, A. I. A., Ibrahim, M. I., Salim, F. N. A., & Ariffin, M. A. I. (2019) 'Health Information Engagement Factors in Malaysia: A Content Analysis of Facebook Use by the Ministry of Health in 2016 and 2017'. *Int J Environ Res Public Health*, 16.
- Wong, S. Y. S., Zhang, D., Sit, R. W. S., Yip, B. H. K., Chung, R. Y., Wong, C. K. M., Chan, D. C. C., Sun, W., Kwok, K. O. & Mercer, S. W. (2020) 'Impact of COVID-19 on loneliness, mental health, and health service utilisation: a prospective cohort study of older adults with multimorbidity in primary care'. *Br J Gen Pract*, 70, e817-e824.
- World Health Organization. (2020a) *Addressing noncommunicable diseases in the COVID-19 response*. WHO Regional Office for the Western Pacific.
- World Health Organization. (2020b) *Rapid assessment of service delivery for NCDs during the COVID-19 pandemic*.
- World Population Review. (2022) 'Best Healthcare in the World 2022' [Online]. Available: <https://worldpopulationreview.com/country-rankings/best-healthcare-in-the-world> [Accessed 27th Aug 2022 2022].

Social Media And Digital Influencers On Instagram: A Case Study

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Abstract: With the emergence of social media and continuous progress and paradigm-shifting breakthroughs in new media, communication professionals need to keep up to date with what consumers are talking about online. Brands tapped into this reality and understood that to influence interactions in this digital landscape, they would need to bring digital influencers into the equation about social media. By recognising that partnerships between beauty brands and digital influencers are a marketing strategy increasingly used by brands and by resorting to Instagram as a research environment, the project presented in this article aimed to understand, through a case study, the impacts that partnerships between the beauty brand Freshly Cosmetics and several digital influencers may have on its followers in Portugal. The study was conducted during the development of a master's dissertation in Applied Communication and, despite focusing on a single brand, enabled the authors to outline the methodology that will be further explored in future work with larger samples of brands. Ten publications from different digital influencers were selected and analysed according to a set of criteria, and a focus group was conducted with ten women who knew the brand under analysis. According to the results obtained, although digital influencers have some impact on decision-making, the participants preferred brands they already knew and their opinions were formed based on research and not on digital influencers' statements. For the participants, feedback from real consumers, external research conducted on their own, and the opinions of experts in the field are responsible for the brand's image in the eye of the consumer.

Keywords: Social media; Digital Influencers; Instagram; Beauty; Brand; Portugal.

1. Introduction

Humans have always tended to imitate certain attitudes and behaviours they see in other human beings, consciously or unconsciously, with multiple purposes, such as facilitating decision-making or seeking social approval. In today's society, the reproduction of similar behaviours is not only limited to the replication of attitudes and habits of close people, such as friends or family members, but also of digital influencers, who inspire and influence attitudes, ideas, and especially consumption habits. The willingness to replicate is, in other words, an aptitude that individuals are born with (Dijksterhuis et al., 2005).

With social media and the sometimes overwhelming evolution of the digital landscape and its paradigms, communication professionals need to keep up to date with what consumers are talking about online. Brands looking to influence these digital conversations turn to digital influencers as key players to upgrade their communication strategies in social media (Forbes, 2016). As soon as brands became aware of this reality, they began looking for influential people who matched the brand's values and target audience. They introduced them as a part of their marketing strategies producing what may be considered influencer marketing (Jaakonmäki et al., 2017). Weinswig (2016), in an article for Forbes Online, mentioned that digital influencers are currently one of the most effective marketing tools brands can use to promote awareness and loyalty. According to the author, most consumers (92%) trust a digital influencer more than an advertisement disseminated through traditional media. Several brands, including beauty brands, have progressively adopted this type of communication strategy in their activities. This trend raises questions about the relationship between brands and digital influencers, the characteristics and metrics that should be analysed when establishing a new partnership with a digital influencer, and the campaign's impact assessment. With these challenges in mind, the study presented in this paper aims to understand if the campaigns carried out between beauty brands and digital influencers impact the consumer. This research shows a case study about the brand Freshly Cosmetics, in which publications and stories created by digital influencers on Instagram were analysed, and a focus group with ten women was conducted to understand the impact that the collaborations between digital influencers and the brand Freshly Cosmetics may have on the brand's followers.

2. Theoretical Framework

Influence marketing has been around for decades through advertising, always trying to get famous people and opinion leaders as brand spokespersons. It has, however, gained a new meaning with the widespread use of communication technologies and social media that have led brands to modify their marketing strategies to meet current market trends. Social media allows the creation of content that enables brands to interact more with their consumers (Castillo & Fernández, 2018). Jung (2015) argues that brands do not perform influence marketing, and if it is done well, it does not resemble marketing. Seeing the brand itself refer to its product and say it is the best does not make the consumer intend to buy it, as the consumer always seeks the opinion of family, friends, and other ordinary people with the same tastes.

From Himmick's (2016) perspective, influence marketing is a marketing strategy based on a communication flow model that considers that consumers are less influenced by traditional media advertising than by the information they get from third parties, such as opinion leaders. These opinion leaders are often seen as influencers, sharing knowledge with other users, offering them essential information, and recommending products and brands they use and like (Keller & Fay, 2016). Himmick (2016) considers that opinion leaders can be celebrities, famous personalities, or bloggers on social media whose visibility grants them a certain degree of influence over their followers. These influencers can capture the attention of brands with the content they share on their social media profiles, which include ratings, recommendations, and product posts. Brown and Hayes (2008) had already concluded that the use of public figures in television ads no longer engages the consumer as before. The same authors have noticed that individuals increasingly identify with "ordinary" people and people who come across as "experts" on specific subjects. Digital influencers have a greater prominence among the countless online content (Lincoln, 2016) and stand out in the crowd. The fact that digital influencers share their daily lives through social media enables the consumers who follow them to feel like they know them and, as a result, build a sense of trust and willingness to act on their recommendations (Zuini, 2016).

For Kapferer (2013), digital influencers are more than just a person or a product, in many cases, they become themselves a brand, just like movie, television, music and fashion celebrities have done for decades. The most significant advantage of investing in marketing actions with digital influencers is the diversity of subjects they can address and the variety of profiles and behaviours, making it easier to choose one that meets the brand's needs (Rockembach et al., 2018). The core and game changer is choosing the right digital influencer for the brand. Suppose there is no clear connection and chemistry between the lifestyle of the digital influencer and the brand's values. As a result, consumers may reject the brand and the digital influencer because the relationship will come across as too fake and commercially driven (Pereira et al., 2016). Choosing digital influencers to work with can be a challenge for brands, so to do the brands have resorted to objective metrics, such as the frequency of publications, content, reach, and social influence (Evans & McKee, 2010) that can be analysed in the decision-making process and provide reliable data to uphold any choice made. There may even be the case that a particular digital influencer may be relevant to a particular brand but irrelevant to another brand in the same sector (Brown & Hayes, 2008). These authors also mention that digital influencers will hardly risk their reputation to promote a product they do not believe in. In another study conducted by Santiago and Castelo (2020), which analysed the perceptions of beauty industry experts regarding digital influencers and influence marketing campaigns on Instagram, it was concluded that all professionals unanimously consider that digital influencers are relevant in the beauty industry. This perceived relevance is essentially due to three factors: (1) the fact that there is a need to try out products and that, through the sharing of experiences and opinions of digital influencers, this need is fulfilled; (2) the credibility that is associated with digital influencers and that makes the followers create a relationship with them, which leads to trusting their opinions; and finally, (3) the ability that digital influencers have to serve as a communication agent, since they can adapt the messages that brands want to put across through their narrative, by including this discourse in their daily lives in an organic way and reaching several audiences.

The same study also concluded that the critical factor in running a good influence marketing campaign on Instagram is the creative freedom given to digital influencers to work on the content. However, the industry professionals mentioned the importance of guidelines and that the content must be approved before publication. Other factors, such as credibility, authenticity, and the relationship between the brand and the digital influencer, were also mentioned.

The Internet provides resources, especially with the dissemination of social networks, which allow the establishment of a more significant relationship between the brand and its consumers, both in terms of promoting faster and more efficient communication between them and in terms of offering more information

to brands about their consumers (Torres, 2010). It is noteworthy, for example, that consumers who have access to the Internet and social networks can become actively involved in the market by sharing opinions with other consumers (OOC, 2009). In this context, Kietzmann et al. (2012) refer that social networks can significantly impact online consumers' behaviour, particularly in how they influence, research, communicate, create groups, establish networks and nurture relationships among them. In this regard, Kotler and Keller (2012) believe that social networks can be understood as a market constantly evolving and changing, thanks to the resources they present and their direct and indirect relationship with consumers.

Current digital consumers demonstrate new research, communication, and purchasing behaviours. In this context, younger individuals, who have a close relationship with the Internet from an early age, embody behavioural consumption habits that brands can no longer ignore (Lendrevie et al., 2010). Thanks to their particularities, social networks allow communication professionals to design marketing strategies that build brand recognition, create dialogue, adjust marketing messages, and create a presence in the digital world (Evans & McKee, 2010).

A social media user who is considered an opinion leader, as digital influencers are, can play a relevant role in their followers' behaviours and may even lead to an increase in the intention to want to recommend that profile or even follow their suggestions (Casaló et al., 2018; Weeks et al., 2017). Consumers tend to place more trust in the opinions of their friends, the digital influencers they follow, or even the reviews they read (Kapitan & Silvera, 2015). In turn, the followers of digital influencers use the reviews on Instagram to reduce the perceived risk, basing their purchases on the trust and admiration they have for that person since they aspire to have the same lifestyle. This may lead to imitating their attitudes, such as their dress and makeup (Djafarov & Rushworth, 2017). For Moura (2016), it is essential to mention that the relationship established with digital influencers is done organically and flows according to personal decisions and the will to engage.

3. Methodology

The study is based on the idea that partnerships between beauty brands and digital influencers are a marketing strategy increasingly used by brands and that Instagram may be used as a research environment for a better understanding of this phenomenon. Its main objective is to understand the impacts that partnerships between the beauty brand Freshly Cosmetics and digital influencers have on consumers through a case study that, besides the literature review, included a focus group and content analysis as its primary source of data collection.

The study adopted an explicit, feasible, and suitable line of inquiry for guiding the research. It defined its research question: "What impact do collaborations between digital influencers and Freshly Cosmetics have on followers?" and set out to validate the following hypothesis: i) Users solely rely on the opinions of influencers when purchasing a product; ii) Users prefer the opinion of professionals or people close to them when deciding what to buy; iii) Users follow influencers associated with the brands they are interested in. By fully embracing the idea that partnerships between beauty brands and digital influencers are a marketing strategy increasingly used by brands and using Instagram as a research environment, this project aims to understand, through a case study, the impacts that partnerships between the beauty brand Freshly Cosmetics and several digital influencers may have on their followers.

In terms of its methodological design, this study has the characteristics of a case study. A focus group was conducted for data collection, and content analysis of Instagram posts and stories was done using an analysis grid including a set of objective, quantifiable metrics.

The analysis grid aided the collection of data from content published by the digital influencers' partnerships with the Freshly Cosmetics brand and included the following metrics:

- Date: used to determine if the content was published within the time frame specified for the analysis;
- Number of comments: used to determine the relationship between the followers and the digital influencers;
- Number of Likes: used as a fundamental variable to determine the level of engagement between the followers and the digital influencers;
- Engagement rate of each publication: used to understand the overall engagement (comments and likes) that the publication may have obtained among the followers.

To understand, in a closer manner, the effect that digital influencers may have on current and potential consumers, a focus group was conducted with a script. The focus group script contained 21 questions on

understanding whether partnerships between beauty brands and digital influencers impact consumers and at what levels.

4. The study

The brand selected for this study was Freshly Cosmetics, a brand that was born in February 2016 in the city of Reus in Tarragona, Spain. It resulted from a passion for natural cosmetics and the entrepreneurial aspect of three young chemical engineering graduates to accelerate and lead the worldwide transition to natural, healthy and sustainable cosmetics (Freshly Cosmetics, 2022). The brand's presence in the digital world consists of its website, a Facebook page, a YouTube channel through Freshly Cosmetics Academy, a TikTok profile, and several Instagram profiles. The brand's Instagram profile in Portugal is @freshlycosmetics_en, chosen for this study because it is aimed at Portuguese consumers.

The profile has a verified account which indicates that the account is authentic and represents a brand, public figure, or celebrity. Through this verification, we are assured that the Instagram account analysed in this study is one of the brand's official accounts. At the beginning of the data collection in the scope of this research, we performed a status check of the account as to some of the metrics that were going to be analysed throughout this study. These metrics included the number of followers, the profile's reach and some data regarding its engagement. To collect this data, we used services provided by the *Not Just Analytics* website (<https://www.notjustanalytics.com/>).

On the day we started collecting data (March 24, 2022), the brand's Instagram account had 54,824 followers. The average number of likes on the profile's posts was 155, with written feedback through comments averaging nine comments per post. The engagement rate, a metric showing us the page's performance, was at the time 0.3%, 3.7% below the engagement rate considered normal by *Not Just Analytics* for pages with a number of followers between 5,000 and 10,000 followers. The engagement rate was calculated based on the performance of the last 12 posts published in the profile. A summary of this data can be seen in the figure below (Figure 1).

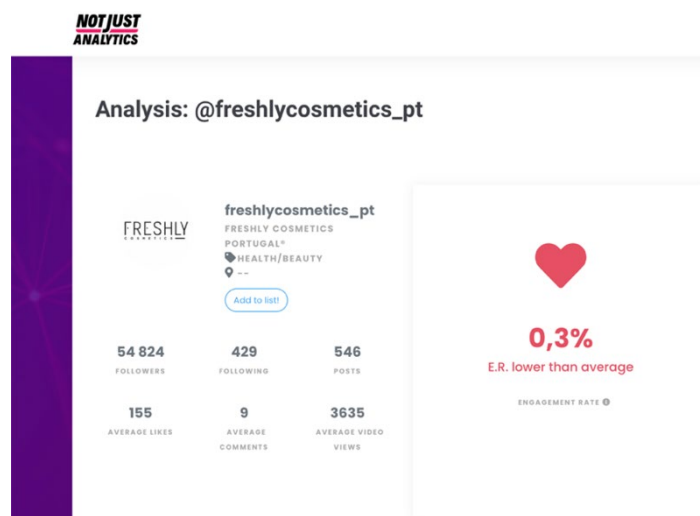


Figure 1 - Instagram Freshly Cosmetics metrics. Source: <https://www.notjustanalytics.com/>

Regarding the influencers, we selected 10 Portuguese influencers endorsed by Freshly Cosmetics: (1) Sara e Raquel - @travels.with.love; (2) Vanessa Martins - @vanessamartins; (3) Liliana Filipa - @lilianafilipa_; (4) Inês Mocho - @inesmocho.makeup; (5) Amélia Barros - @meeelbarros; (6) Ana Rita Simão - @ana_ritasimao; (7) Cristina Negrão - @crisoutfitideas; (8) Carla Alípio - @de2passamosa4; (9) Margarida de Castro Gonçalves - @margaridadecastrog; and (10) Ana Barão - @anynhabarao. The selection of these influencers and their publications was made according to the following criteria:

- the publication demonstrated that it was an advertisement, whether through the use of hashtags with the reference PUB or with the indication of a paid partnership;
- the publications were from profiles recognised as digital, macro, or micro-influencers. An analysis of the type of publications made by the profile owner, as well as the number of followers, enabled us to categorise the profile;

- the publications openly presented Freshly Cosmetics products and promoted the products (i.e., reference to some characteristics of the product, call to action suggesting product purchase by followers);
- the publications showed the number of likes and comments for each publication.

In addition to the analysis of the publications, a focus group was carried out to collect input regarding the consumers' perception of the communication strategy adopted by the digital influencers and their partnerships with the brand. Opting for a smaller number of participants allowed us to create an easygoing vibe, making it easier for everyone to give their opinion. All participants were female to collect opinions from a fully female group capable of representing the female audience who currently leads the cosmetics industry, as proven in a recent study by Kolmar (2022).

The selected women participating in the focus group met the following requirements: (1) Belonged to the brand's target audience; (2) Were active users of Instagram; (3) Followed at least one digital influencer on Instagram. The following section presents the main results obtained in this study.

5. Results

The study conducted, although limited to a single brand, enables us to collect quantitative and qualitative information linked to user engagement with content and influencers and its relevance in decision-making in product purchases. As previously presented in the theoretical framework section of this paper, there is a sense that influencers play a relevant role in promoting brand and product trends and preferences. There is, however, much to be said as to the real impact major influencers with hordes of followers may have in the users' decision process. The results attained provide further insight into this matter confirming that promoting products through influencers will not always guarantee relevant results in terms of the brand's return on investment or its return on engagement.

Among the 10 influencers chosen for this study, as shown in figure 2, we are able to find groups of followers that, in terms of their numbers, are quite a different spanning from little over seven thousand to well over half a million.

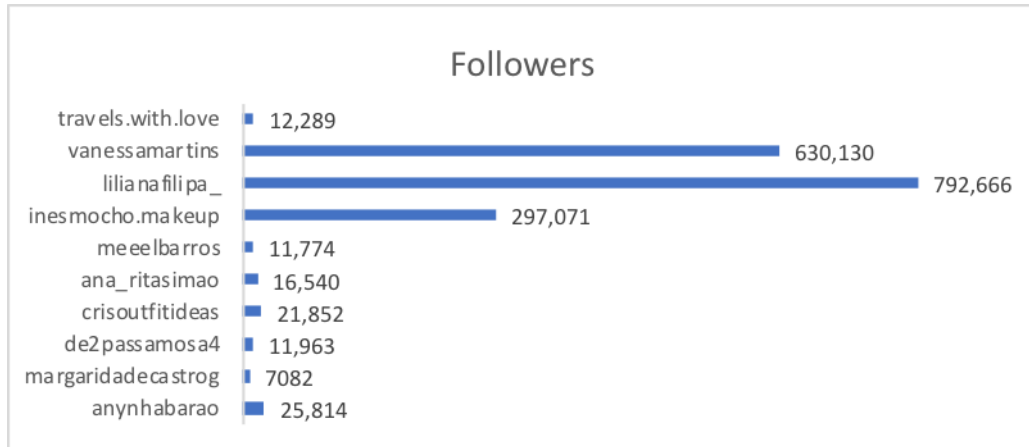


Figure 2 – Number of followers per influencer analysed in the study

The following table (Table 1) presents a summary of each digital influencer, their number of followers and the engagement rate achieved with the Freshly Cosmetics brand product publication analysed during this study:

Table 1 – Digital influencers, number of followers and engagement rate of the publication done in partnership with Freshly Cosmetics

Digital Influencer	Followers	Comments	Likes	Engagement Rate of the publication analysed
(1) travels.with.love	12 289	53	206	2,11%
(2) vanessamartins	630 130	22	4847	0,77%
(3) lilianafilipa_	792 666	54	14300	1,81%
(4) inesmocho.makeup	297 071	18	1916	0,65%
(5) meeelbarros	11 774	9	1452	12,4%
(6) ana_ritasimao	16 540	319	1237	9,40%
(7) crisoutfitideas	21 852	8	3523	16,16%
(8) de2passamosa4	11 963	58	1385	11,9%
(9) margaridadecastrog	7082	168	1030	16,91%
(10) anynhabarao	25 814	182	2226	9,32%

The engagement rate was obtained by adding each publication's number of comments and likes, then dividing it by the number of followers and multiplying the result by one hundred. As we can see from the previous table, digital influencer @lilianafilipa_ has the most significant number of followers (792,666), but in terms of engagement (1,81%), she did not even make the top 5 highest engagement rates achieved. Indeed, @margaridadecastrog has much fewer followers (16,540) but has the highest engagement rate (16,91%) among the digital influencers considered. It is clear that high numbers of followers may not lead to high engagement rates. It is also interesting to see that the type of engagement varied. Influencers with fewer followers got more comments, showing the followers' willingness to spark conversation and ask questions instead of just leaving a simple like. One might even affirm that this sort of behaviour is closer to what any consumer does when pondering a purchase. This issue of asking for additional information and opinions emerged as quite relevant in the focus group session. Large numbers of followers do not enable this sort of closer communication dynamics. Undoubtedly, the fact that a particular digital influencer has a considerable number of followers can give the publication a more significant reach; however, this does not mean that its engagement is more than just a cluster of frugal likes. A focus group was conducted to dig deeper into behaviour and decision-making issues related to the brand considered in our study and the influencers' role.

The focus group included 10 women aged between 21 and 30 from different regions of Portugal. To set aside geographical and each of the participants' schedule limitations, the focus session was held on Google Meet and lasted around 2 hours. All the participants were asked permission to record the session for future content analysis. They were also assured that the recording would solely be used for the ongoing research and would not be shared or used for any other purpose.

Through several questions posed during the focus group, we noticed a purchase intention directly related to digital influencers, to the extent that all but two participants admitted having already made a purchase influenced by digital influencers. In general, the participants who made the purchase were satisfied, and when asked if they would repurchase the same product, the answer was also positive.

During the focus group, it was also possible to realise that the products recommended by digital influencers were useful for their followers since they share topics of interest. However, it should be noted that most of these purchases were only made after additional research by the consumers. All of them responded negatively when asked if they would be able to make a purchase solely based on digital influencers' advice. They are always left in doubt about the veracity and authenticity of what the influencers are advertising. The focus group participants believe that what digital influencers share about their brand partnerships is not enough for them to be trusted and believed. According to the results obtained, and despite identifying a connection with digital influencers, the participants prefer brands they already know and whose opinions were formed based on research and not on digital influencers' statements. We can see that for the participants, digital influencers can add value to brands, but only if they are truthful and real because the consumer can already distinguish organic content from paid content. For the focus group participants, the feedback of real consumers, the external analysis they carry out, and the views of people specialised in the area are responsible for the brand's real image in the eyes of the consumer.

6. Conclusions

Regarding the research question "What impact do collaborations between digital influencers and Freshly Cosmetics have on consumers?" the study shows that these partnerships had little or no impact on the group of consumers who participated in this research. Although almost all the participants had already had contact with publications of alliances between the Freshly Cosmetics brand and digital influencers, thus recognising the brand, this is not what makes them buy the brand's products. However, for the participants in the focus group, the partnership established between the brand and the digital influencers they work with can benefit Freshly Cosmetics since, being a relatively new brand in the market, it allows it to expand and position itself in the market. Still, they do not consider it a strategy that makes them buy the brand's products because they think that sometimes the number of publications about the brand with which they interact on their Instagram profiles is excessive, thus making them question if the opinions of the digital influencers are honest or just paid to advertise.

As for the hypothesis formulated the analysed publications showed that Instagram profiles with many followers do not guarantee high levels of engagement. We can also conclude through the analysis of the comments on the publications that there are always comments made about the products, most of them showing interest in trying the product. However, many comments have no relation to the publication itself.

Through the analysis of the data collected, it was possible to see that the participants, despite having access to much information from digital influencers, still sought additional information about the products, admitting that they do not feel influenced, conclusions that are in line with those obtained by Moura (2016). Although it was found that there is a connection between followers and digital influencers, it was also understood that digital influencers could lead the consumer to have an interest in buying. Still, their opinion is not the only driving reason for the purchase. The participants in the study revealed that the opinion of people close to them or professionals in the field is essential, as well as taking care to conduct additional research independently.

It was noticed that the participants are currently more attentive to what is shared on Instagram, specifically regarding the beauty brands that digital influencers recommend. The consumer is increasingly less influenced and more focused, always trying to get the best products at the best price that meet their real needs.

The focus group results led us to conclude that the participants do not make purchases based only on the digital influencer's opinions about the products he advertises. The digital influencers' opinion is not as crucial to the participants as, for example, the opinion of a person close to them and whom they trust. Through this study, we understood that participants can pay more attention to the information they get through Instagram and that they are careful to have more knowledge about a product before being influenced.

It is important to emphasise that this research was conducted based on the consumer's point of view, according to a small sample of Instagram publications focused on only one brand.

Despite these limitations, this study allowed us to make some observations about how the Freshly Cosmetics brand uses partnerships with digital influencers to impact consumers' decision-making. All the focus group participants follow at least one digital influencer with a partnership with the brand. Almost all of them had already had contact with the brand, which provided additional input for the study.

For future research, it would be interesting to increase the number of brands analysed and broaden the focus of the study by establishing contact with communication agencies that specialise in influence marketing. This would provide additional views on the issues considered through specific information from brands and digital influencers regarding campaigns already carried out.

Acknowledgements

This work is funded by National Funds through the FCT - Foundation for Science and Technology, I.P., within the scope of the project Ref^a UIDB/05507/2020. Furthermore, we would like to thank the Centre for Studies in Education and Innovation (CI&DEI) and the Polytechnic of Viseu for their support.

References

- Brown, D., and Hayes, N. (2008). *Influencer Marketing: Who Really Influences Your Customers?* Butterworth-Heinemann.
- Casaló, L. V., Flavián, C., and Ibáñez-Sánchez, S. (2018). Influencers on Instagram: Antecedents and consequences of opinion leadership. *Journal of Business Research*. 117.
- Castillo, D. and Fernández, R. (2019). The role of digital influencers in brand recommendation: Examining their impact on engagement, expected value and purchase intention. *International Journal of Information Management*. 49. 366-376. 10.1016/j.ijinfomgt.2019.07.009.
- Dijksterhuis, A., Smith, P., Baaren, R. and Wigboldus, D. (2005). The Unconscious Consumer: Effects of Environment on Consumer Behavior. *Journal of Consumer Psychology*. 15. 193-202. 10.1207/s15327663jcp1503_3.
- Djafarova, E., and Rushworth, C. (2017). Exploring the credibility of online celebrities' Instagram profiles in influencing the purchase decisions of young female users. *Computers in Human Behavior*, 68, 1–7. <https://doi.org/10.1016/j.chb.2016.11.009>
- Evans, D., and McKee, J. (2010). *Social media marketing: The next generation of business*. Indiana: John Wiley and Sons.
- Freshly Cosmetics (2022). Available at: <https://www.freshlycosmetics.com/pt/> (Accessed: January 3, 2023).
- Himmick, J. (2016). *Influencer marketing: How to make money on Instagram* (1st edition). Washington: Kindle e-book.
- Jaakonmäki, R., Müller, O. and com Broke, J. (2017). The Impact of Content, Context, and Creator on User Engagement in Social Media Marketing. *Proceedings of the 50th Hawaii International Conference on System Sciences* (2017), (January), 1152-1160. <https://doi.org/10.24251/hicss.2017.136>
- Jung, L. (2015). What is influencer marketing (in layman's terms). The Shelf.
- Kapferer, J. N. (2013). *The new strategic brand management: Advanced insights and strategic thinking*. Kogan Page, London and Philadelphia.
- Kapitan, S., and Silvera, D. H. (2016). From digital media influencers to celebrity endorsers: attributions drive endorser effectiveness. *Marketing Letters*, 27(3), 553–567. <https://doi.org/10.1007/s11002-015-9363-0>
- Keller, E., and Fay, B. (2016). How to use influencers to drive a word-of-mouth strategy. Warc Best Practice.
- Kietzmann, J., Silvestre, B., McCarthy, I. and Pitt, L. (2012). The social media phenomenon: towards a research. *Journal of Public Affairs*. 12 (2), 109-119.
- Kolmar, C. (9 de agosto de 2022). 24 Powerful Cosmetics Industry Statistics [2022]: What's Trending In The Beauty Business? Available at: <https://www.zippia.com/advice/cosmetics-industry-statistics/>
- Kotler, P. and Keller, K.L. (2012). *Marketing Management*. 14th Edition, Pearson Education.
- Lendrevie, J., Baynast, A., Dionísio, P., Rodrigues, J. V. and Emprin, C. (2010). *Publicitor - Comunicação 360º Online Offline*. Lisboa: Dom Quixote. *Comunicação E Sociedade*, 19, 361–364.
- Lincoln, J. (2016). *Digital influencer: a guide to achieving influencer status online* (1st Edição). United States: CreateSpace Independent Publishing Platform.
- Moura, C. (2016). Amigos com benefícios. São os «influencers». *Observador*. Available at: <https://observador.pt/especiais/amigos-com-beneficios-sao-os-influencers/> (Accessed: April 8, 2022)
- Office of Competition and Consumer Protection (OCCP). (2009). Awareness of consumer rights and analysis of barriers preventing consumers from safe and satisfactory participation in the market. Available at: <https://uokik.gov.pl/download.php?plik=8519>. (Accessed: January 3, 2023)
- Pereira, C., Antunes, A. and Maia, A. (2016). Embaixadores de marca: reconhecimento e prestígio 'entre a vida ordinária e o sucesso'. *Compós, Goiânia*.
- Rockembach, G., Moraes, S. and Garré, B. (2018). Investigando alguns modos de subjetivação do corpo jovem na mídia contemporânea. *RELACult - Revista Latino Americana de Estudos em Cultura e Sociedade*, 4.
- Santiago, J. and Castelo, I. (2020). Digital influencers: An exploratory study of influencer marketing campaign process on Instagram. *Online Journal of Applied Knowledge Management*. 8. 31-52. 10.36965/OJAKM.2020.8(2)31-52.
- Torres, C. (2010). Guia prático de marketing na internet para pequenas empresas. Available at: http://uab.ifsul.edu.br/tsiad/conteudo/modulo5/gne/biblioteca/claudio_torres_-_mktdigitalpequenaempresa.pdf. (Accessed: September 22, 2022)
- Weinswig, D. (2016). Influencers Are The New Brands. Available at: <https://www.forbes.com/sites/deborahweinswig/2016/10/05/influencers-are-the-newbrands/#19110e827919> (Accessed: September 2, 2022)
- Zuini, P. (2016). *Conteúdo sem blá-blá-blá*. Rio de Janeiro.

Social Media Use and its impact on Egyptian MSMEs' Growth

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Abstract: Micro, small and medium enterprises (MSMEs) have benefited significantly from the use of social media (SM) in reaching customers and growing sales in a most efficient way. This study compares Facebook and Instagram as two separate social media platforms and examines to what extent the use of each of these SM platforms affects the growth of MSMEs. It distinguishes financial growth and non-financial growth and uses two theories to conceptualize the relations within the context of social media usage: the Social Exchange Theory (SET) and the Task Technology Fit (TTF) Theory. Results of the quantitative and qualitative analysis based on data of 383 MSMEs show that using social media (SM) has helped MSMEs achieve both financial and non-financial growth. Facebook, more specifically, leads to financial growth (higher sales volume in the short-term), while Instagram leads to more customer engagement and higher brand performance, with the positive and significant moderating effect of the length of social media use.

Keywords: Micro, Small and Medium Enterprises (MSMEs), Social Media, Task-Technology Fit (TTF), Social Exchange Theory (SET), Growth

1. Introduction

Social Media (SM) provides tremendous advantages to MSMEs, whether by enhancing customer loyalty, creating marketplace intelligence, exposing companies to new markets, increasing sales, decreasing costs, and/or promoting efficiency (Henninger, Alevizou, and Oates, 2017; Thongmak, 2019). This has been quite evident during the COVID 19 crisis which triggered many changes in the conduct and processes of businesses in general, and that of SMEs, in particular. Facebook and Instagram have reported first places in terms of customer usage in the MENA region and around the world (Arab Social Media Report, 2017).

There have been a limited number of empirical studies that measured the effects of using online platforms on indicators of performance (Qalati et al, 2019); previous research called for examining specific social media and its performance in new geographic areas, specially Africa and Australia (Juniarti, Omar, and Tahir, 2022). Therefore, this study aims at comparing Facebook and Instagram as two separate SM platforms that were proven to enhance the growth of the MSMEs. This study compares Facebook and Instagram as two separate social media platforms and examines to what extent the use of each of these SM platforms affects the growth of MSMEs.

2. Background

A report published in 2016 showed that 39% of social media users do use it to find out about products and services (Nielsen, 2016). The number of social media users in the MENA region and in Egypt is on the rise and shows no signs of slowing down, whether in the number of new users, or the hours spent online by existing users.

2.1 SM Use

The use of SM is a combination of three main components (Fakhreldin, Ayman, and Miniesy, 2020): its perceived ease of use (Roy, Maxwell, and Carson, 2014), perceived usefulness (Fishbein and Ajzen, 1975) and its use capability (Bianchi, Glavas, and Mathews, 2017). This perspective stems from the Technology Acceptance Model (TAM), which suggests that the actual use of a new technology depends on the user's attitude towards it (Rauniar et al, 2014), in terms whether s/he accepts it as useful, beneficial and has the capabilities required for using it. As the usefulness component represents the strongest influencing antecedent of SM use (Fakhreldin, Ayman, and Miniesy, 2020), it is chosen in this study to be the variable measuring the use/adoption of SM.

Facebook is the most popular SM platform in the world with 2.603 billion users as per Statista's first quarter report (Statista, 2020b) making it the major platform when it comes to reaching new customers. In Egypt, the number of active Facebook accounts has reached more than 44 million users in Feb.2022 (Kemp, 2022), making it the leading SM platform in Egypt, as well. Instagram has over 200 million users visiting at least one business profile daily and with 90% of the accounts on the platform following at least one business account (Instagram

Internal Data, 2018). In Egypt, Instagram has over 16 million users and a 5.8% quarter-on-quarter increase (Kemp, 2022).

It should be noted that some industries are thriving on Instagram, such as fashion and beauty, household and auto; others thrive on Facebook more such as retail, fast moving consumer goods (FMCG) and finance (Socialbakers, 2020); both platforms are not substituting, they must be approached as entirely separate channels (Socialbakers, 2020). Moreover, previous research also suggested that in many cases they were complementary (Fakhreldin, Ayman, and Miniesy, 2020).

2.2 Growth

Financial growth is one of the main measurements of performance of an enterprise/firm (Ipinnaiye, Dineen, and Lenihan, 2017). The most common proxy used to measure financial growth is the growth in the sales volume (Gupta and Wales, 2017), as reported in 22 different studies. Recently market valuations of several SM companies have been supporting more nonfinancial measures to capture growth, mainly through a broad domain of customer engagement (Weitz, Henry, and Rosenthal, 2014) and brand performance (Fan et al, 2021). It is necessary to combine both qualitative and quantitative measures to get a fuller perspective of the overall growth potentials of a product or service (Cray, 2012) as was the case in Gilmore et al (2007), when they measured growth by using a quantitative measure (sales growth) and two qualitative measures (customer relations and new market entry).

2.3 SM and Growth

Various scholars concluded in their empirical research that there is a positive relationship between SM adoption and overall performance (Rodriguez, Peterson, and Krishnan, 2012; Smits and Mogos, 2016; Ahmad, Abu Bakar, and Ahmad, 2018). It is suggested that the more fit the technology is in meeting the objectives, the more positive impact it will have on performance. This reflects the theory of Task Technology Fit (TTF) introduced by Goodhue and Thompson in 1995, which later became an established theory in IT research (Rai and Selnes, 2019). Within the context of SM, Fu et al (2020) examined the extent to which SM is chosen based on the fit of its technology characteristics to the required task. The system characteristic must match the user's task needs (Goodhue and Thompson, 1995) to achieve high efficiency and better performance. Therefore, the TTF presents an adequate theoretical framework to be used in examining the effect of the SM use on various aspects of performance of the businesses. It was reported by Rai and Selnes (2019) that studying TTF required different scales based on the specific variables reflecting how well the technology is integrated with the focal task.

The present study will also use the Social Exchange Theory (SET), which suggests that enterprises will only spend on and engage in SM when they believe that this endeavour is rewarding and worth the time and effort exerted (Webb and Roberts, 2016). SET has the advantage of taking both rewards and costs into consideration (Matikiti, Roberts-Lombard, and Mpinganjira, 2016). When perceived benefits are greater than perceived costs, individuals (business owners) are more likely to participate in the activity (Matikiti, Roberts-Lombard, and Mpinganjira, 2016; Zhang et al, 2019). Although SET has been previously used to explain the logic behind spending on SM, mainly from the point of view of customers or individuals (Zhang et al, 2019), this study examines it from the enterprises' perspectives where owners invest in SM (incurred cost) to achieve rewards in the form of growth (both financial and non-financial).

2.4 SM and Financial Growth

Jagongo and Kinyua (2013) confirmed that effective SM usage results in higher return on investment (ROI), especially for small businesses, which was also concluded by Fakhreldin, Ayman and Miniesy (2020) showing an increase in sales volume because of SM use. Thus, this study will test the following hypotheses:

H1: The use of Facebook by MSMEs has a significant positive effect on sales volume.

H2: The use of Instagram by MSMEs has a significant positive effect on sales volume.

2.5 SM and Non-Financial Growth

Customer engagement is considered an important performance metric to measure growth of the business showing various levels of engagement (Thongmak, 2019). This was confirmed in a recent study that consulted 28 articles showing that the use of SM enhances customer relationship leading to higher SME performance

(Alshourah et al, 2021). In the SM context, customer engagement is defined as the average number of likes, comments, and shares per post (Thongmak, 2019). Therefore, the study will test the following hypotheses:

H3: Using Facebook has a significant positive effect on customer engagement.

H4: Using Instagram has a significant positive effect on customer engagement.

Brand performance within SM refers to the owner's perception of brand image reflected in brand visibility and reputation (Fan et al, 2021). SM usage also leads to higher brand performance in terms of improved brand value (Hudson et al, 2016), as well as higher customer loyalty (Asamoah, 2014). The most popular dimension used to measure brand performance are brand equity (Vomberg, Homburg, and Bornemann, 2014), or brand reputation combined with brand equity (Qalati et al, 2019).

Considering the above, the following hypotheses are proposed:

H5: Using Facebook has a significant positive effect on brand performance.

H6: Using Instagram has a significant positive effect on brand performance.

Based on the above discussion, Figure 1 demonstrates the research framework.

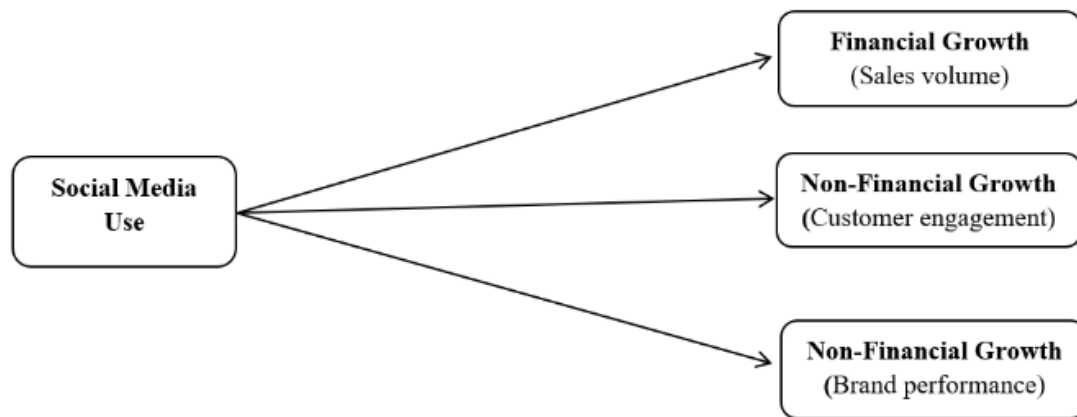


Figure 1: Proposed Research Framework

3. Methodology

This study adopts the Central Bank of Egypt (2018) definition of MSMEs and uses the self-assessment method of data collection, which is accepted in the SME literature (Ahmad and Alaskari, 2014), by approaching MSMEs owners/managers via phone to respond to the survey, as they are the most familiar with their businesses (Asamoah, 2014). The criteria considered in selecting the MSMEs was that they have been using SM for at least one year and that they are willing to participate in the study (Fraenkel and Wallen, 1996). Egypt has around 3.6 million registered MSMEs, with 40% in the Greater Cairo area (Fakhreldin, Ayman, and Miniesy, 2020).

The variables are developed and adopted based on several previous studies (Ainin et al, 2015) and are reflected in the various sections; all using a five-point Likert scale ranging from "1=Strongly Disagree" to "5=Strongly Agree" (Salvador, Pinot de Villechenon, and Rizzo, 2014). The process of data collection was outsourced to an external specialised company and was done through phone interviews during the period from June to September 2019. The quantitative statistical analysis was completed using SPSS; interviews were conducted with five of the MSME owners/managers to obtain a thorough explanation of the statistical outcome (McNamara, 1999) and to validate the research findings (Alshenqeeti, 2014).

A total number of 383 managers filled the surveys completely; the sample included different industries to ensure the generalisation of findings (Alarcón-del-Amo, Rialp-Criado, and Rialp-Criado, 2017). Tables 1 and 2 show the descriptive statistics.

Table 1: Sample Demographics

Age	40 or higher	40.2%
	28 to 39	45.7%
	17 to 27	8.4%
	Younger than 16	0%
Gender	Male	70.45%
	Female	29.55%

Table 2: Nature of SM Use

Nature of digital/SM tool use	Percentage
Basic information and contacts	81.2%
Product image	83.8%
Product description	64.2%
Prices and promotions	53.8%
Full E-commerce website	1%
Customer comments and feedback	3.1%
To receive customer orders	8.9%

Table (3) shows the correlation between all dependent and independent variables. All communalities' values for all components are greater than 0.5 which indicate high validity of these items, all values of loadings are greater than 0.5 indicating high correlation between these questions (Table 4). A value of alpha of 0.6-0.7 indicates an acceptable level of reliability (Griethuijsen et al, 2014), and 0.8 or greater a very good level (Ursachi, Horodnic, and Zait, 2015; El Hajjar, 2018). For all the indicators KMO test is significant since its p-value is 0.000 which is less than the significance level $\alpha = 0.05$, and the value of KMO-test value is higher than or equal 0.5 for all indicators which indicate that the factor analysis results are reliable. Step-wise regression is used to determine which variables have a significant effect on the dependent variables, which is done by using the ordinary least square (OLS) (Chatterjee and Hadi, 1988).

Table (5) shows that 3 dependent variables were not normally distributed because the significance value of those variables were below 0.05. However, since the valid collected sample is greater than 100 responses, according to (Sekaran, 2003), a research study sample size above 30 to 50 participants can run parametric tests, especially in multivariate research. Therefore, simple linear regression analysis is used to test the hypotheses in the study.

The control variables examined are: the age, gender and educational level of the owner, the length of SM use by the firm, the number of branches, the number of partners, the number of full time employees, the number of years of formal operation, the source of funding and the type of the activity of the enterprise. Regression analysis with dummy variable techniques with interaction terms is used to check the moderation effect. This is done for the scope of the projects, the number of full-time employees, the educational level of the owner/manager and the length of SM use.

Table 3: Correlations

	Mean	SD	<u>SMUseful</u>	<u>Financ. Growth</u>	<u>CustomerEng</u>	<u>BrandPerform</u>	<u>FB- Useful</u>	<u>FB- Financ.l Growth</u>	<u>FB- Custome rEng</u>	<u>FB- BrandP erform</u>	<u>Insta- Useful</u>	<u>Insta- Financi. Growth</u>	<u>Insta- Custom erEng</u>	<u>Insta- BrandP erform</u>
<u>SMUseful</u>	3.5696	.66362	1											
<u>Financial Growth</u>	3.0926	1.7457	.319**	1										
<u>CustomerEng</u>	3.8488	.81590	.803**	.394**	1									
<u>BrandPerform</u>	3.8738	.87995	.745**	.238**	.789**	1								
<u>FB- Useful</u>							1							
<u>FB-Financ. Growth</u>	3.0157	1.8154					.408**	1						
<u>FB- CustomerEng</u>	3.7016	.87740					.935**	.407**	1					
<u>FB- BrandPerform</u>	3.7309	.95250					.841**	.325**	.609**	1				
<u>Insta- Useful</u>											1			
<u>Insta-Financ. Growth</u>	3.2188	1.6237									.306**	1		
<u>Insta-CustomerEng</u>	4.0276	.69700									.749**	.273**	1	
<u>Insta-BrandPerform</u>	4.0637	.75524									.729**	.216**	.603**	1

** . Correlation is significant at the 0.01 level (2-tailed).

Table 4: Confirmatory Factor Analysis

			Communalities	Factor loading	Reliability/ Cronbach Alpha	KMO Test	Average Variance Extracted
VAR #	Question	Variable Name/Formulation Question			(CR)		(AVE)
1		SM-useful (Using electronic tools)			0.994	0.966	%93.19
	Q10	increase sales volume	0.986	0.993			
	Q11	increase profits	0.986	0.993			
	Q12	reduce cost of advertising and promotions	0.976	0.988			
	Q13	reduce cost of customer service and support	0.978	0.989			
	Q14	facilitate financial transactions (payments, etc...)	0.979	0.989			
	Q15	easy to start and manage a business	0.982	0.991			
	Q16	increase market share	0.987	0.993			
	Q17	make communication with partners more effective	0.723	0.85			
	Q18	initiating customer relations	0.725	0.851			
	Q19	increase customer loyalty and retention	0.985	0.992			
	Q20	tools increase electronic word of mouth	0.986	0.993			
	Q21	expand internationally	0.968	0.984			
	Q22	increase range of products and services	0.981	0.991			
	Q23	improve image of company	0.986	0.993			
	Q24	increase interactive communication with customers	0.986	0.993			
2		Financial Growth	0.698	0.835	0.809	0.485	%63.60
	Q45	Increase sales transactions FB	0.953	0.976			
	Q46	Increase sales volume FB	0.953	0.976			
	Q51	Increase sales transactions Instagram	0.986	0.993			
	Q52	Increase sales volume Instagram	0.986	0.993			
4		CustomerEngage			0.675	0.709	50.70%
	Q18	Initiating customer relations	0.725	0.851			
	Q19	Increase customer loyalty and retention	0.985	0.992			
	Q20	Increase electronic word of mouth	0.986	0.993			
	Q24	Measuring effectiveness of message to customers	0.986	0.993			
3		BrandPerform			0.64	0.618	58.96%
	Q19	Increase customer loyalty and retention	0.985	0.992			
	Q23	Improved image of company	0.986	0.993			
	Q24	Measuring effectiveness of message to customers	0.986	0.993			
5		Facebook Financial Growth			0.95	0.5	95.30%
	Q45	Increase in Sales Transactions	0.953	0.976			
	Q46	Increase in Sales Volume	0.953	0.976			
6		Facebook Customer Engagement			0.685	0.601	58.06%
	Q18	Initiating customer relations	0.725	0.851			
	Q19	Increase customer loyalty and retention	0.985	0.992			
	Q20	Increase electronic word of mouth	0.986	0.993			
	Q24	Measuring effectiveness of message to customers	0.986	0.993			
	Q47	Increase in sales inquiries	0.514	0.512			
	Q48	Increase in Number of Customers	0.514	0.511			
3		Facebook Brand Performance			0.64	0.618	58.96%
	Q19	Increase customer loyalty and retention	0.985	0.992			
	Q23	Improved image of company	0.986	0.993			
	Q24	Measuring the effectiveness of our message to customers	0.986	0.993			
7		Instagram Financial Growth			0.986	0.5	98.58%
	Q51	Increase in sales transactions	0.986	0.993			
	Q52	Increase in sales volume	0.986	0.993			
8		Instagram Customer Engagement			0.575	0.526	53.71%
	Q18	Initiating customer relations	0.725	0.851			
	Q19	Increase customer loyalty and retention	0.985	0.992			
	Q20	Increase electronic word of mouth	0.986	0.993			
	Q24	Measuring effectiveness of message to customers	0.986	0.993			
	Q53	Increase in Sales Inquiries	0.938	0.969			
	Q54	Increase in Number of Customers	0.929	0.964			
3		Instagram Brand Performance			0.64	0.618	58.96%
	Q19	Increase customer loyalty and retention	0.985	0.992			
	Q23	Improved image of company	0.986	0.993			
	Q24	Measuring effectiveness of message to customers	0.986	0.993			

Table 5: One-Sample Kolmogorov-Smirnov Test

One-Sample Kolmogorov-Smirnov Test				
		Financial growth	Facebook Financial growth	Instagram Financial growth
N		359	223	136
Normal Parameters^{a,b}	Mean	3.0926	3.0157	3.2188
	Std. Deviation	1.74579	1.81547	1.62374
Most Extreme Differences	Absolute	.205	.204	.207
	Positive	.137	.137	.136
	Negative	-.205	-.204	-.207
Test Statistic		.205	.204	.207
Asymp. Sig. (2-tailed)		.000 ^c	.000 ^c	.000 ^c

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

4. Findings and Discussion

To compare between those who used Facebook only and those who used Facebook and Instagram, an independent-samples T-test is utilised and the results are shown in Table (6). It shows that the average of each of customer, brand performance, the use of SM, is greater for those who use Instagram and Facebook than those who use only Facebook. This difference is significant at the 95% confidence level, as the p-values associated with them are less than 5%. However, financial growth is not significantly different in both groups at the 95% confidence level.

Table 6: Independent-Samples T-Test

	Use	Customer engagement	Brand Performance	financial growth	SM-Use
Facebook only		3.7479	3.7692	3.0157	3.4610
Facebook& Instagram		4.0276	4.0637	3.2188	3.7652
p-value		0.0010	0.0020	0.2860	0.0000

Below are the three models (Figures 2, 3 and 4) summarizing the analysis and results of: 1) The effect of SM overall on financial growth, customer engagement and brand performance. 2) The effect of Facebook on financial growth, customer engagement and brand performance. 3) The effect of Instagram on financial growth, customer engagement and brand performance. There is a positive and significant effect of the SM use on the financial growth of Egyptian MSMEs (95% confidence). This positive and significant relationship confirms previous literature (Jagongo and Kinyua, 2013; Gupta and Wales, 2017). The same analysis is used in the case of using each platform Facebook and Instagram and show a significant and positive relation (95% confidence). The results confirm the findings of previous literature of Jordanian SMEs (Alshourah et al, 2021) and with the conclusion of the 41 studies published from 2015 to 2021 which examined in the relation between SM use and growth from a financial and a marketing perspective (Juniarti, Omar, and Tahir, 2022). It also echoes the findings of the study of 423 SMEs in Pakistan (Fan et al, 2021). However, as shown in the models, it is to be noted that the control variables are different in each model. This implies the need to deal with each platform in a different way to maximise the benefit of using it in terms of financial and/or nonfinancial growth.

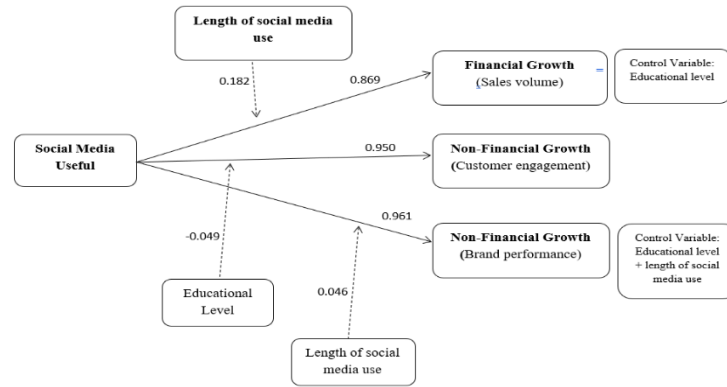


Figure 2: Model 1: Impact of using SM on Financial and Non-Financial Growth

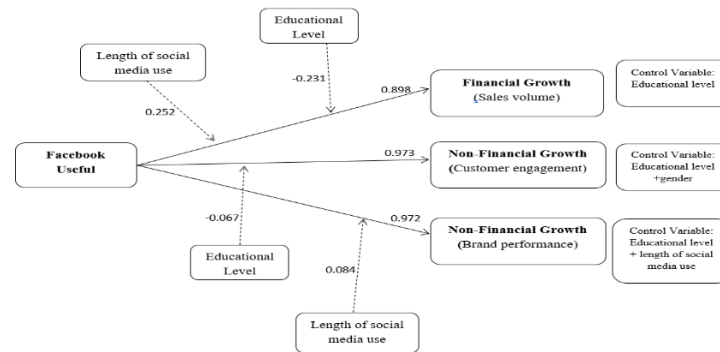


Figure 3: Model 2: Impact of using Facebook on Financial and Non-Financial Growth

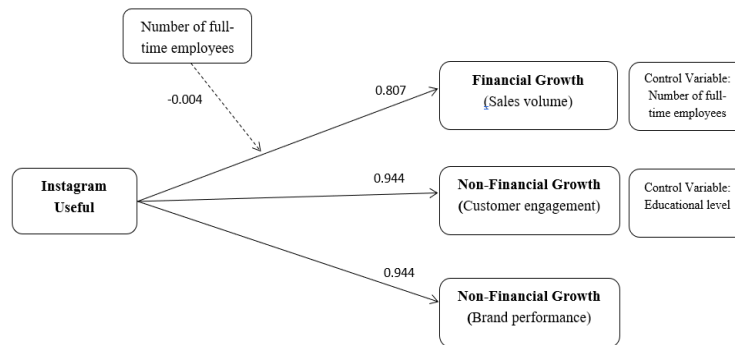


Figure 4: Model 3: Impact of using Instagram on Financial and Non-Financial Growth

5. Conclusion and Recommendations

Using SM has helped MSMEs achieve an increase in sales volume, in addition to a positive impact on customer engagement (in terms of electronic word-of-mouth, customer inquiries) and a positive impact on brand performance (in terms of perceived brand image, customer loyalty and retention). Building on this, company owners may be inclined to follow up and constantly monitor the rate of engagement on their pages where they feel the benefit of this instantly as the number of page followers increase (Weitz, Henry, and Rosenthal, 2014). Facebook's impact can be considered short-term in outcome, as it achieves quick financial growth; Instagram's impact is long-term and achieves higher customer engagement and better brand performance, which will eventually lead to financial growth.

This study contributes to expanding the literature on both the Task-Technology-Fit (TTF) and the Social Exchange Theory (SET) combined, as a lens to capture the different relationships and effects of the SM usage and the

growth of the MSMEs in Egypt. Moreover, the SET was studied from the perspective of MSME business owners rather than the usual perspective of customers (Webb and Roberts, 2016; Zhang et al, 2019). This helped the researchers understand that business owners invest in SM (incurred cost) to achieve rewards in the form of growth (both financial and non-financial).

It is clear, that Facebook is more male-oriented and for customers older than 30 years of age; Instagram is more for female customers and younger generation (Statista, 2020a). Thus, using both platforms is more efficient and effective (Fakhreldin, Ayman, and Miniesy, 2020), as the findings show that the results of Facebook and Instagram together on growth are indeed better than the ones of Facebook alone.

The fact that the study was conducted on MSMEs in the Greater Cairo area is a limitation that hinders generalisation. Therefore, this research should be a starting point for future research to examine in more detail the comparison between Facebook and Instagram and the effect they have on other outcomes, e.g. employment, internationalisation, employer branding and others. Also, the effect on growth can be studied in different cultures, as new moderating variables may emerge. Finally, a comparison may be made between developing and developed countries, to verify the generalisability of the findings of the current study.

Acknowledgments

This study is partially financially funded by the British University in Egypt (YIRG). The authors would like to thank Ms. Mahitab Shahin for her valuable input.

References

- Ahmad, M., and Alaskari, O. (2014) "Development of assessment methodology for improving performance in SME's", *International Journal of Productivity and Performance Management*, Vol 63, No.4, pp.477-798.
- Ahmad, S., Abu Bakar, A., and Ahmad, N. (2018) "Social media adoption and its impact on firm performance: the case of the UAE", *International Journal of Entrepreneurial Behavior and Research*.
- Ainin, S., Parveen, F., Moghavvemi, S., Jaafar, N., and Shuib, N. (2015) "Factors influencing the use of social media by SMEs and its performance outcomes", *Industrial Management and Data Systems*, pp. 570-588.
- Alarcón-del-Amo, M., Rialp-Criado, A., and Rialp-Criado, J. (2017) "Examining the impact of managerial involvement with social media on exporting firm performance", *International Business Review*, Vol 27, No. 2, pp. 355-366.
- Alshenqeeti, H. (2014) "Interviewing as a Data Collection Method", *English Linguistics Research*, Vol. 3, No. 1, pp. 39-45.
- Alshourah, S., Jodeh, I., Swiety, I. and Ismail, A., 2022. Social Customer Relationship Management Capabilities and Performance: Moderating Social Media Usage among SMEs Jordanian. *Decision Sciences*, 25(S2), pp.1-8.
- Arab Social Media Report (2017) *Social Media and the Internet of Things; Towards Data-Driven Policymaking in the Arab World: Potential, Limits and Concerns*. UAE: Mohammed Bin Rashid School of Government.
- Asamoah, E. (2014) "Customer based brand equity (CBBE) and the competitive performance of SMEs in Ghana", *Journal of Small Business and Enterprise Development*, Vol. 21, No. 1, pp. 117-131.
- Bianchi, C., Glavas, C., and Mathews, S. (2017) "SME international performance in Latin America: The role of entrepreneurial and technological capabilities", *Journal of Small Business and Enterprise Development*, Vol. 24, No. 1, pp. 176-195.
- CAPMAS (2020, April). *Central Agency for Public Mobilization and Statistics; Egypt in Numbers*. Retrieved July 21, 2020, from https://www.capmas.gov.eg/Pages/StaticPages.aspx?page_id=5035
- Central Bank of Egypt. (2018). *Improving Access to Finance; The CBE's Vision and Strategy towards SMEs*. Retrieved from www.uabonline.org/en/events/conferences/.../presentation/download
- Chatterjee, S., and Hadi, A. (1988). *Sensitivity Analysis in Linear Regression*. New York: John Wiley and Sons.
- CIA World Factbook (2020). *The World Factbook; Egypt*. Retrieved 7 21, 2020, from <https://www.cia.gov/library/publications/the-world-factbook/geos/eg.html>
- Cray, E. (2012) "The Social ROI: Successful Social Media Measurement From an Agency Standpoint", *The Elon Journal of Undergraduate Research in Communications*, Vol. 3, No.1.
- De Vries, N., and Carlson, J. (2014) "Examining the drivers and brand performance implications of customer engagement with brands in the social media environment", *Journal of Brand Management*, Vol. 21, No.6, pp. 495-515.
- Egypt Digital Report (2017). *2017 Trends Report: The Top Online Statistics in Egypt*. Retrieved from <http://consultyasser.com/egypt-digital-report-2017-top-online-statistics/>
- El Hajjar, S. (2018) "Statistical Analysis: Internal -Consistency Reliability and Construct Validity", *International Journal of Quantitative and Qualitative Research Methods*, Vol. 6, No. 1, pp. 27-38.
- Fan, M., Qalati, S., Khan, M., Shah, S., Ramzan, M. and Khan, R. (2021) "Effects of entrepreneurial orientation on social media adoption and SME performance: The moderating role of innovation capabilities", *PloS one*, Vol. 16, No. 4, p.e0247320, 1-24 (Fan et al, 2021).
- Fakhreldin, H., Ayman, A., and Miniesy, R. (2020) "Social Media Use and its Effect on the Performance of MSMEs in Egypt", *15th European Conference on Innovation and Entrepreneurship*, Rome, Italy.

- Fishbein, M., and Ajzen, I. (1975) *Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research* (1st ed.). Boston, Massachusetts, United States: Addison-Wesley.
- Fraenkel, J., and Wallen, N. (1996) *How to Design and Evaluate Research in Education*. New York: McGraw-Hill.
- Fu, J., Shang, R., Jeyaraj, A., Sun, Y., and Hu, F. (2020) "Interaction between task characteristics and technology affordances", *Journal of Enterprise Information Management*, Vol. 33, No. 1, pp. 1-22.
- Gilmore, A., Gallagher, D., and Henry, S. (2007) "E-marketing and SMEs: operational lessons for the future", *European Business Review*, Vol. 19, No. 3, pp. 234-247.
- Global Digital Overview (2020). *Digital 2020*. Hootsuite, we are social.
- Goodhue, D., and Thompson, R. (1995) "Task-Technology Fit and Individual Performance", *MIS Quarterly*, pp. 213-236.
- Griethuisen, R., Eijck, M., Haste, H., Brok, P., Skinner, N., Mansour, N., . . BouJaoude, S. (2014) "Global Patterns in Students' Views of Science and Interest in Science", *Research Science Education*, Vol. 45, pp. 581-603.
- Gupta, V. K., and Wales, W. J. (2017). Assessing organisational performance within entrepreneurial orientation research: Where have we been and where can we go from here? *The Journal of Entrepreneurship*, 26(1), 51-76.
- Henninger, C., Alevizou, P., and Oates, C. (2017) "IMC, social media and UK fashion micro-organisations", *European Journal of Marketing*, Vol. 51, No. 3, pp. 668-691.
- Hudson, S., Huang, L., Roth, M., and Madden, T. (2016) "The influence of social media interactions on consumer-Brand relationships: A three-country study of BBrand perceptions and marketing behaviors", *International Journal of Research in Marketing*, pp. 27-41.
- Instagram Internal Data. (2018). Retrieved from www.business.instagram.com
- Ipinnaie, O., Dineen, D., and Lenihan, H. (2017) "Drivers of SME performance: a holistic and multivariate approach", *Small Business Economics*, Vol. 48, pp. 883-911.
- Jagongo, A., and Kinyua, C. (2013) "The Social Media and Entrepreneurship Growth. *International Journal of Humanities and Social Science*", pp. 213-227.
- Juniarti, R.P., Omar, A. and Tahir, S. (2022) "Driving the Impact of Social Media in SMEs for A Better Performance: A Literature Review", *Global Business and Management Research*, No. 14.
- Kemp, S. (2022).) *Digital 2021:Egypt*. <https://datareportal.com/reports/digital-2022-egypt>
- Lee, K., Lee, B., and Oh, W. (2015) "Thumbs up, sales up? the contingent effect of facebook likes on sales performance in social commerce", *Journal of Management Information Systems*, Vol. 32, No. 4, pp. 109-143.
- Lian, S., and Yoong, L. (2018) "Customer engagement in social media and tourism brand performance implications", *The Turkish Online Journal of Design, Art and Communication*, pp. 1186-1194.
- Matikiti, R., Roberts-Lombard, M., and Mpinganjira, M. (2016) "Drivers of the use of social networking sites for travel arrangements in South Africa", *Journal of Global Business and Technology*, Vol. 12, No. 2, pp. 28-43.
- McNamara, C. (1999). *General Guidelines for Conducting Interviews*. Minnesota: Authenticity Consulting, LLC.
- Nielsen. (2016). *Social Studies: A look at the Social Landscape*. Retrieved from Nielsen Social Media Report: <https://www.nielsen.com/us/en/insights/reports/2017/2016-nielsen-social-media-report.html>
- Qalati, S., Wenyan, W., Kwabena, G., Erusalkina, D., and Pervaiz, S. (2019) "Influence of Brand Equity on Brand Performance: Role of Brand Reputation and Social Media", *International Journal of Research and Review*, Vol. 6, No. 9, pp. 304-317.
- Rai, R., and Selnes, F. (2019) "Conceptualizing task-technology fit and the effect on adoption – A case study of a digital textbook service", *Information and Management*.
- Rapp, A., Beitelspacher, L. S., Grewal, D., and Hughes, D. E. (2013) "Understanding social media effects across seller, retailer, and consumer interactions", *Journal of the Academy of Marketing Science*, Vol. 41, No. 5, pp. 547-566.
- Rauniar, R., Rawski, G., Yang, J., and Johnson, B. (2014) "Technology acceptance model (TAM) and social media usage: an empirical study on Facebook", *Journal of Enterprise Information Management*, Vol. 27, No. 1, pp. 6-30.
- Rodriguez, M., Peterson, R., and Krishnan, V. (2012) "Social Media's Influence on Business-To-Business Sales Performance", *The Journal of Personal Selling and Sales Management*, pp. 365-378.
- Roy, A., Maxwell, L., and Carson, M. (2014) "How is Social Media being used by Small and Medium-Sized Enterprises", *Journal of Business and Behavioral Sciences*, Vol. 26, No. 2, pp. 127-137.
- Salvador, E., Pinot de Villechenon, F., and Rizzo, H. (2014) "European SMEs and the Brazilian market: The key role of social networks", *European Business Review*, Vol. 26, No. 4, pp. 368-388.
- Sekaran, U. (2003). *Research Methods for Business: A skill-building approach*. New York: John Wiley and Sons.
- Smits, M., and Mogos, S. (2013) "The impact of social media on business performance", *Proceedings of the 21st European Conference on Information Systems*. London: Association for Information System.
- Smits, M., and Mogos, S. (2016) "The Impact Of Social Media On Business Performance", *Proceedings of the 21st European Conference on Information Systems*.
- Socialbakers. (2020). *The State of Social Media Marketing: Facebook vs. Instagram in 2020*. Socialbakers.
- Statista. (2020a). *Global digital population as of April 2020*. Retrieved from Statista.com: <https://www.statista.com/statistics/617136/digital-population-worldwide/>
- Statista. (2020b). *Number of monthly active Facebook users worldwide as of 1st quarter 2020*. Retrieved from Statista.com: <https://www.statista.com/statistics/264810/number-of-monthly-active-facebook-users-worldwide/>
- Statista. (2020c). *Distribution of Instagram users worldwide as of April 2020, by age group*. Retrieved from Statista.com: <https://www.statista.com/statistics/325587/instagram-global-age-group>

- Thongmak, M. (2019) "Do we know what contents work for social commerce? A case of customer engagement in Facebook brand pages", *International Journal of Electronic Commerce Studies*, Vol. 10. No. 2, pp. 141-174.
- Ursachi, G., Horodnic, I., and Zait, A. (2015) "How reliable are measurement scales? External factors with indirect influence on reliability estimators", *7th International Conference on Globalization and Higher Education in Economics and Business Administration*.
- Vomberg, A., Homburg, C., and Bornemann, T. (2014) "Talented people and strong brands: The contribution of human capital and brand equity to firm value", *Strategic Management Journal*, Vol. 36, No.13, pp. 2122-2131.
- Webb, S., and Roberts, S. (2016) "Communication and Social Media Approaches in Small Businesses", *Journal of Marketing Development and Competitiveness*, Vol. 10, No. 1.
- Weitz, R., Henry, T., and Rosenthal, D. (2014) "Limitations of Nonfinancial Metrics Reported by Social Media Companies", *Journal of International Technology and Information Management*, Vol. 23, No. 3, pp. 11-44.
- Weitzl, W., Beldad, A., Einwiller, S., and Zniva, R. (2017) Creating brand performance with social media: An abstract, *Marketing at the Confluence between Entertainment and Analytics* (pp. 1329-1329). Springer.
- Zhang, S., Kwok, R., Lowry, P., and Liu, Z. (2019) "Does more accessibility lead to more disclosure?", *Information Technology and People*, Vol. 32, No. 3, pp. 754-780.

Accounting and Social Media: A Structured Literature Review and Research Avenues

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Abstract: Purpose: Over the last ten years, social media gradually gained an increasingly active and relevant role in social and economic and corporate contexts. Particularly, social media plays a key role in accounting issues such as corporate strategy, corporate disclosure towards stakeholders, balance sheet and reporting. Thus, social media has become the easiest and most immediate way for companies to make execution of strategies and disclosure information and in general manage several accounting issues. In this scenario, this paper has the purpose to investigate the relationship between accounting and social media to draft emerging research paths and future avenues of research understanding what role social media is playing in companies and their value. Design/Methodology/Approach: We adopted the structured literature review (SLR) to draft emerging issues and future avenues in this field. This methodology contributes to identifying research trends and future research directors (Di Vaio et al., 2021; Secundo et al., 2020; Popay et al., 2006; Jesson and Lacey., 2020). Investigating relevant literature, we selected the range of keywords to compose the research query, we validated our results on Scopus database using the operator "TITLE-ABS-KEY". In Line with our purpose we limited research query only to "final" documents published in "English" between 2018 and 2022. We conducted a not grey analysis identifying 206 articles about the theme of accounting and social media. Findings: Our analysis provides results on emerging issues and avenues in this research stream. Emerging issues are directed towards the relationship among accounting and social media, the effect of social media on the company system, how social media can serve a strategic level in the company, the role of social media in the organizational system, how social media are regarded by investors and so on. Originality/value: Our research contributes to increase the study on accounting and social media to offer readers a renewed perspective of study drafting the future research avenue.

Keywords: accounting, social media, accountant, accounting systems, digital media, social networks, strategic management, corporate value

1. Introduction

'Corporate social media' is a broad term that refers to the varied use of social media by organisations to achieve disparate business objectives, such as knowledge exchange and communication (Kirchner et al., 2021; Leonardi et al., 2013). Over time, social media has become a key resource for any organisation, as it can enable efficient and effective sharing of information and knowledge (Ashrafi et al., 2019; Liu and Bakici, 2019).

This paper aims to contribute to the existing literature on social media and the company focusing on accounting and social media drafting the state of the art and determining emerging future research. We have analysed the relationship between accounting and social media in the context of companies using the structured literature review method (SLR) adopting a content and bibliometric analysis (Di Vaio et al., 2021; Secundo et al., 2020; Popay et al., 2006; Jesson and Lacey., 2020). From this research, two main issues emerged. The first issue that we are going to highlight is the effect of social media in companies such as the link between performance and social media (Ghanem, Hamid, 2020); so depending on the use of social media within the company, different effects can occur. The second issue is how the use of social media can be made within companies; it will then be shown how a strategic use of social media can be used favorably by companies; companies can acquire knowledge and use it strategically in their favor (Fischer, et al., 2021).

In addition, this SLR is fundamental as to why it is important to analyse this relationship. This relationship has become important over the years as social media is beginning to play a fundamental role in the society. Just as their role in the society is becoming relevant, it is also becoming important to emphasize that social media within companies should play a recognized role; social media should be recognized as creating new opportunities for companies (Engmann, 2021).

According to data from the Digital 2021 October Global Report, 4.55 billion people worldwide use social media, a figure that is set to grow (by the end of 2022, it is believed it could reach 60 per cent). Based on the above-mentioned data, the use of social media in the society seems relevant and at the same time the understanding of the state of the literature too. Since social media is an ever-changing topic and the way it is perceived and used by contemporary society is constantly evolving, this paper stands as an initial SLR to draft the state of the art and to define future researches.

The use of social media requires the analysis of the time and generational constraints that these entails. Indeed, social media is a communication tool considering it quite modern. The recent introduction of social media in the life of companies (Ashrafi et al., 2019; Liu and Bakici, 2019) as well as in the everyday lives of people seen its limitation, as there is still little literature. This limitation makes the SLR an original and innovative element and a starting point from which the sample of articles assumed for this analysis will be expanded.

Our analysis provides results on emerging issues and avenues in this research stream. Emerging issues are directed towards the relationship among accounting and social media, the effect of social media on the company system, how social media can serve a strategic level in the company, the role of social media in the organizational system, how social media are regarded by investors and so on. Our research contributes to increase the study on accounting and social media to offer readers a renewed perspective of study drafting the future research avenue.

The paper is structured in four sections: after the introductory section, the second section presents the methodology. Section three shows the Findings, and Section 4 presents the conclusions.

2. Methodology

We applied a qualitative method to answer our research questions. This method seems the best choice in achieving our research aims because qualitative research is discovery oriented, with analysis using the data collected to generate ideas and theories, and is therefore based on inductive reasoning (Hair Jr J.F. et al. 2003).

The present study applied a qualitative method based on the structured literature review (SLR) to draft emerging issues and future avenues in this field. This methodology contributes to identifying research trends and future research directors (Di Vaio et al., 2021; Secundo et al., 2020; Popay et al., 2006; Jesson and Lacey., 2020) The adjective "systematic" means that the review is based on clearly formulated questions, identifies relevant studies, appraises their quality and summarises the evidence by use of explicit methodology (Khan et al., 2003).

Investigating relevant literature, we selected the range of keywords to compose the research query, validating results on Scopus database using the operator "TITLE-ABS-KEY". Scopus database is considered the largest abstract and citation database and includes over 20,000 peer-reviewed journals in the fields of science, technology, medicine, social sciences, and arts and humanities (Fahimnia et al., 2015). The choice not to use Web of Science database is in line with the argument of previous studies. In fact, according to Waltman (2016) 97% of articles indexed in Web of Science (WoS) are also included in the Scopus database.

In the first phase, we identified the following keywords "social media", "accounting" and "firm performance". The above-mentioned keywords were searched in "title", "abstract" and "authors keywords" of documents belonging to Scopus database. The initial search resulted in 468 documents. After several refinements, we obtained the following research query: TITLE-ABS-KEY("social media") AND (accounting) AND ("firm performance") AND (LIMIT-TO (PUBSTAGE,"final")) AND (LIMIT-TO (DOCTYPE,"ar") OR LIMIT-TO (DOCTYPE,"cp") OR LIMIT-TO (DOCTYPE,"ch")) AND (LIMIT-TO (SUBJAREA,"BUSI") OR LIMIT-TO (SUBJAREA,"ECON")) AND (LIMIT-TO (PUBYEAR,2022) OR LIMIT-TO (PUBYEAR,2021) OR LIMIT-TO (PUBYEAR,2020) OR LIMIT-TO (PUBYEAR,2019) OR LIMIT-TO (PUBYEAR,2018)) AND (LIMIT-TO (LANGUAGE,"English")). Before selecting our final sample, an advanced search option was enabled that limited results to publications in the form of "articles", "book chapters" and "conference paper" published in the English language. The restriction of the search criteria to papers published between 2018 till 2022 was applied as it was considered the period in which social media were used the most by users for all sorts of reasons (entertainment, scientific and political information, purchases, sponsorships); in particular, during the Covid-19 pandemic the curtailment of physical mobility has led a heretofore upwardly mobile, ambitious generation of home-bound individuals to rediscover social media platforms (SMPs) (Goel and Gupta, 2020). As a result of the systematic literature search, we obtained a final database of 206 articles.

According to Ryan and Bernard (2003), analyzing text involves several tasks, the first is discovering themes and subthemes. The themes connote what the author wants to describe (Ryan and Bernard, 2003). Thus, themes

and sub-themes represent the core ideas, arguments and conceptual linking of expressions on which an article's research questions, constructs, concepts and/or measurements are based (Liñán and Fayolle, 2015). Drawing on these principles and in contrast with analytical approaches, we obtained 5 topics from our holistic understanding of each article (Jones et al. 2011). We also applied a primary bibliometric analysis to draft emerging topics in achieving our research aims. We used a dedicated software that is VOSviewer.

Thus, this paper also aims to answer the following research questions:

RQ1: What is the state of the art the studies of accounting and social media?

RQ2: How social media impact on accounting?

3. Findings

3.1 Data Collection and Analysis

This section presents the results of our analysis answering to research questions and thus investigating what the relationship between accounting and social media in the companies; we investigate how these can impact on accounting. We established five emerging targets' topic as follows:

- **A1:** The strategic use of social media in companies: this topic includes, how a strategic use of social media impacts the company, i.e. how companies use social media according to their target market.
- **A2:** The effects of social media in companies: in this topic we looked at how social media can have positive and negative effects not only in terms of the reputation a company may have in its target market, but also how the correct use of social media can impact a company's financial performance.
- **A3:** Social media in the corporate organization structure. In this class are grouped all those articles, which emphasize the importance of taking social media into account within the corporate structure, as they have gained an important role within companies over the years
- **A4:** How social media is viewed by stakeholders: this topic groups together articles that emphasize the importance of social media with regard to stakeholders, i.e. how social media can influence the opinion that stakeholders have of a particular company and how companies can therefore attract certain stakeholders through the correct use of social media
- **A5:** Others. In this group we inserted the paper that couldn't be inserted in the previous classes

3.2 Discussion of Results/Findings

Table 1: Article Topics¹

Topics	Articles	%
A1	59	28,64%
A2	74	35,92%
A3	23	11,16%
A4	32	15,53%
A5	18	8,73%
Total	206	100%

¹ Which in detail are as follows:

- A1: The strategic use of social media in companies
- A2: The effects of social media in companies
- A3: Social media in the corporate organisation structure
- A4: How social media is viewed by stakeholders
- A5: Others

Results from Table 1 allow to understand which are the most discussed topics when social media are linked to the corporate world. The most relevant topic is based on the effects that social media brings to companies, in fact in 35.92% of the articles (74 papers) deal with, the topic was present; this topic can be interpreted in several ways such as in the link between the performance of SMEs' in Abu Dhabi UAE and the use of social media was studied (Ghanem and Hamid, 2020). Another example of articles that deal with the effects of the use of social media are those that analyze the impact of the appearance or use of social media by certain components of the corporate organizational structure such as the CEO, may have on a company (Bai L., et al., 2019).

Another topic deals with the strategic use of social media in companies; it is retrieved in 28.64% of the articles (59 papers). This topic has many facets some articles for example highlighted how the emergence of new digital technologies such as social media give companies a great opportunity to gain a great deal of knowledge that companies can exploit to their advantage depending on how they use it (Fischer, et al. 2021). Another result is how the correct use of social media during the Covid-19 pandemic gave greater value to companies, which, even on social media, were more sensitive to the social and environmental aspect than others (Iazzi, et al. 2022). In fact, during the pandemic, companies that were more sensitive to environmental and social aspects were more transparent and accountable towards stakeholders and preserving their reputation. Furthermore, it can also be highlighted how the correct use of social media during the Covid-19 pandemic period had better results on companies, which used it in their favor.

The third most used topic is how social media is considered by stakeholders. It is retrieved in 15.53% of the articles (32 papers). This topic also has multiple facets; an example of stakeholders are users, who may consider relevant information about the company through social media or through online word-of-mouth (Zhang, C., et al.2020); it follows, therefore, that based on their proper use, social media are able to influence stakeholders. Consequently, this class also includes what social media can be used for in relation to stakeholders.

Finally, the topic with the lowest number of articles is based on social media in the corporate organizational structure. In this topic there are 11.16% of articles (23 papers). This is an innovative topic and there are not many authors who have dealt with it. In this group, there are articles analysing how the presence of social media in companies can be able to assess potential new opportunities (Engmann, 2021); and it is precisely through the creation of these new opportunities that it would be important to find social media a recognised role within companies.

After dividing the articles according to topics, we grouped the articles by year, as can be seen in Table 2.

Table 2

Years	Articles	%
2022	48	23,30%
2021	55	26,69%
2020	51	24,75%
2019	30	14,56%
2018	22	10,67%
Total	206	100%

The data emerging from Table 2 is that there is an increase from 2018 to 2021 in the number of articles dealing with social media topics in relation to accounting.

Table 2 also shows that there may be a slight decrease in the publication of articles, which deal with the topics of social media in relation to accounting, however, it must be taken into account that the data set was constructed with the articles present on Scopus on 2nd November 2022 (resulting in the 206 papers of the sample used in this article). The query was repeated on 13th November 2022 and yielded 211 articles, supporting that there is an increasing focus on articles that deal with the topic of social media in relation to accounting.

On the other hand, it was not possible to divide the sample of articles by geographical area, because not all the articles examined referred to a sample that can be placed in a single geographical area; as many articles analysed the relationship between social media and a specific sector (such as tourism, cars, etc.).

At the same time, we could not divide the articles by the origin of the authors, as many papers had several authors, who were of different nationalities.

The bibliometric analysis of the sample allows to draft emerging keywords as reported below in Figure 1 as co-occurrences of keywords. Even if this is a primary analysis, it allows to combine keywords.

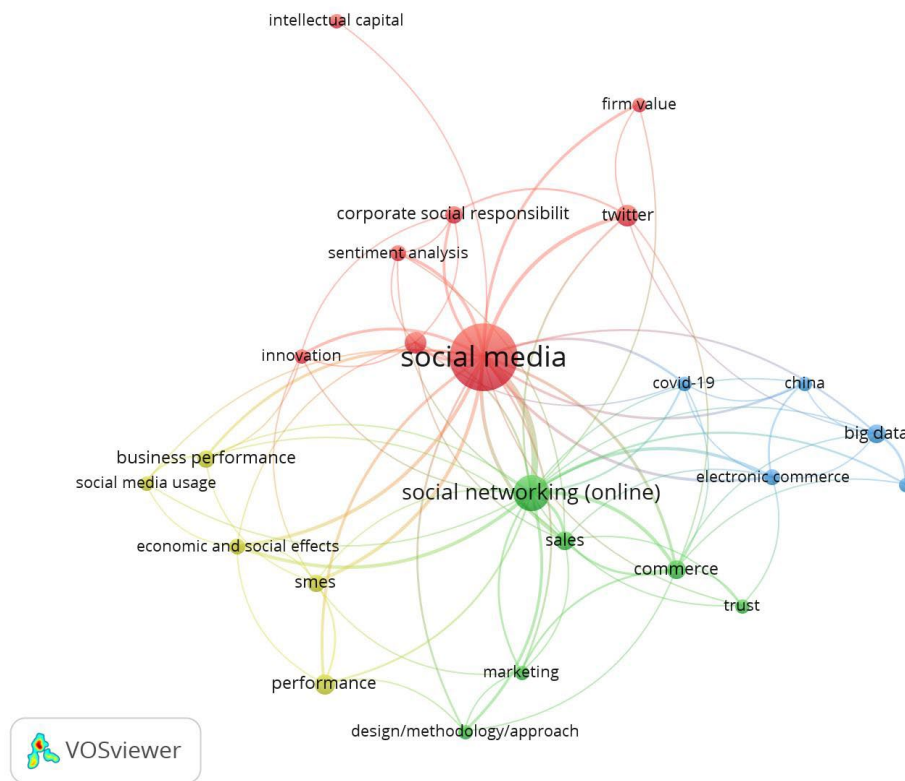


Figure 1: Co-occurrences of keywords

According to the co-occurrence of keywords analysis, we retrieved four clusters of keyword as reported below:

Cluster 1 (red cluster)
Corporate social responsibility
Firm performance
Firm value
Innovation
Intellectual capital
Sentiment analysis
Social media
Twitter
Cluster 2 (green cluster)
Commerce
Design/methodology/approach
Marketing
Sales
Social networking (online)
Trust
Cluster 3 (blue cluster)
Big data
China
Covid-19
Electronic commerce
Social media analysis

Cluster 4 (yellow cluster)
Business performance
Economic and social effects
Smes
Social media usage

The most relevant cluster is 1 (red cluster) emphasizing the connection among social media, corporate social responsibility and firm value and performance.

4. Conclusion

Social media gradually gained an increasingly active and relevant role in social and economic and corporate contexts. Particularly, social media plays a key role in accounting issues such as corporate strategy, corporate disclosure towards stakeholders, balance sheet and reporting. Thus, social media has become the easiest and most immediate way for companies to make execution of strategies and disclosure information and in general manage several accounting issues. Thus, this paper was directed to draft the state of the art in the relationship between accounting and social media.

Our results have several theoretical and practical implications among which we retrieved how the number of articles dealing with this topic has grown in recent years. The reasons behind why the use of social media is beginning to be given a great deal of space is because the latter are to all intents and purposes part of people's daily lives and consequently also of the lives of companies. According to data from the Digital 2021 October Global Report, 4.55 billion people worldwide use social media, a figure that is set to grow (by the end of 2022, it is believed it could reach 60 per cent).

On the basis of the articles analysed, we analysed how the relationship between companies and social media is focused on the effects of social media in the company and how a strategic use of social media can have an impact on company performance (RQ1). Answering “RQ1: What is the state of the art the studies of accounting and social media?”, it becomes of paramount importance how social media can influence company performance not only in the image perspective, but also in the sales perspective (Kooli K., et al. 2021).

The study of the relationship between the company and social media, however, also reveals the existence of a GAP at the organisational level, as many articles have pointed out that there is still no clear and defined role within the company's organisational set-up with regard to social media. In order to address “RQ2 How social media impact on accounting?”, with regard to the impact of social media on accounting, the relationship exists and is confirmed by articles in the relationship between the use of social media impacting on accounting, sometimes positively, sometimes negatively (RQ2).

This paper has several limitations among which the use of primary set of studies to extend in the future. The future research is directed to investigate the following emerging topics:

1. Social media in the business organization
2. How companies treat social media from an accounting perspective
3. The positive or negative effects that social media have on financial statement and firm performance

Future research could be conducted through case study, thanks to this method it would be possible to analyse on a practical level how companies behave towards social media, as it is done through interviews conducted directly with companies.

References

- Ashrafi, A., Ravasan, A. Z., Trkman, P., & Afshari, S. (2019). The role of business analytics capabilities in bolstering firms' agility and performance. *International Journal of Information Management*, 47, 1-15.
- Bai, L., Yan, X., & Yu, G. (2019). Impact of CEO media appearance on corporate performance in social media. *The North American Journal of Economics and Finance*, 50, 100996.
- Di Vaio, A., Syriopoulos, T., Alvino, F., & Palladino, R. (2021). “Integrated thinking and reporting” towards sustainable business models: a concise bibliometric analysis. *Meditari Accountancy Research*.
- Engmann, A. (2021). The effect of online social interaction on entrepreneurial opportunity evaluation: A mediation approach. *Journal of Governance and Regulation/Volume*, 10(4).
- Fahimnia, B., Tang, C.S., Davarzani, H., Sarkis, J., 2015b. Quantitative models for managing supply chain risks: a review. *European J. Oper. Res.* 247 (1), 1–15.

- Fischer, D., Prasuhn, J., Strese, S., & Brettel, M. (2021). The role of social media for radical innovation in the new digital age. *International Journal of Innovation Management*, 25(07), 2150075.
- GHANEM, S. K. R., & Hamid, N. A. B. A. (2020). The effect of Facebook, WhatsApp, Twitter and email on SMEs performance: empirical evidence from United Arab Emirates. *Journal of Internet Social Networking and Virtual Communities*, 2020, 1-17.
- Goel, A., & Gupta, L. (2020). Social media in the times of COVID-19. *Journal of clinical rheumatology*.
- Hair Jr J.F., Celsi W., Money A.H., Samouel P., Page M.J. (2003), *Essentials of Business Research Methods*, Wiley.
- Hair Jr J.F., Celsi W., Money A.H., Samouel P., Page M.J. (2003), *Essentials of Business Research Methods*, Wiley.
- Iazzi, A., Ligorio, L., & Iaia, L. (2022). Were we prepared to face a pandemic? Exploring companies' CSR disclosure on social media before COVID-19 outbreak. *Management Decision*, (ahead-of-print).
- Jesson, J., & Lacey, F. (2006). How to do (or not to do) a critical literature review. *Pharmacy education*, 6(2).
- Jones, M. V., Coviello, N., & Tang, Y. K. (2011). International entrepreneurship research (1989–2009): a domain ontology and thematic analysis. *Journal of business venturing*, 26(6), 632-659.
- Khan, K.S., Kunz, R., Kleijnen, J. and Antes, G. (2003), "Five steps to conducting a systematic review", *Journal of the Royal Society of Medicine*, Vol. 96 No. 3, pp. 118-121.
- Kirchner, K., Jørgensen, R., Bolisani, E., & Scarso, E. (2021). A bi-dimensional classification and characterization of enterprise social media users. *Measuring Business Excellence*.
- Kirchner, K., Jørgensen, R., Bolisani, E., & Scarso, E. (2021). A bi-dimensional classification and characterization of enterprise social media users. *Measuring Business Excellence*.
- Kooli, K., Tzempelikos, N., & Hammouda, M. Y. (2021). The influence of B to B firms use of multiple social media platforms on relationship sales performance: an institutional perspective. *Journal of Business-to-Business Marketing*, 28(2), 105-123.
- Liñán, F., & Fayolle, A. (2015). A systematic literature review on entrepreneurial intentions: citation, thematic analyses, and research agenda. *International Entrepreneurship and Management Journal*, 11(4), 907-933.
- Liu, Y., & Bakici, T. (2019). Enterprise social media usage: The motives and the moderating role of public social media experience. *Computers in Human Behavior*, 101, 163-172.S
- Popay, J., Roberts, H., Sowden, A., Petticrew, M., Arai, L., Rodgers, M., ... & Duffy, S. (2006). Guidance on the conduct of narrative synthesis in systematic reviews. A product from the ESRC methods programme Version, 1(1), b92.
- Roohani, S Attaran - *International Journal of Disclosure and Governance* , 2014 Social media: New challenges and opportunities for corporate governance.
- Ryan, G. W., & Bernard, H. R. (2003). Techniques to identify themes. *Field methods*, 15(1), 85-109.
- Secundo, G., Ndou, V., Del Vecchio, P., & De Pascale, G. (2020). Sustainable development, intellectual capital and technology policies: A structured literature review and future research agenda. *Technological Forecasting and Social Change*, 153, 119917.
- Waltman, L. (2016). A review of the literature on citation impact indicators. *Journal of informetrics*, 10(2), 365-391.
- Zhang, C., Song, P., Qu, Z., Xue, L., & Li, J. (2020). Firm actions, user engagement, and firm performance: a mediated model with evidences from internet service firms. *Information & Management*, 57(7), 103364.

Can Social Media be Sustainable: Economic and Industrial Modelling Instruments to Mitigate the Unneeded use of Resources in Social Media and Artificial Intelligence

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Discussion topic: Market-driven developments: Economic forces driving the industry towards sustainability

Abstract: Social media can help businesses and society implement sustainable practices (Bodin & Prell (Eds.), 2011). They also contribute to excessive resource use in data collection and sharing, digital resource use, and energy consumption (Kamin & Paireekreng, 2018). Thus, TikTok's feeds consume 15.81 mAh per minute and emit 2.63 gEqCO₂/min in 2021. (Derudder, 2021). The generation that uses this tool most (Burns-Stanning, 2020) is also the most demanding and aware of climate change issues (Knight, 2016), even though its practices contribute to the current degradation. This hiatus illustrates how difficult it is to reconcile individual and collective goals. We propose shifting the question from the end-user to the service provider by detecting sobriety pits in data use and access to perpetuate or avoid disrupting end-user practices. Sobriety (frugality) is a critical variable in energy transition scenarios (Balzani, 2019) and one of the ecological transition's pillars. Social media and AI are particularly tense on these issues (Stein, 2020). Current solutions often pit energy efficiency against performance (Ikhlasse, Benjamin, Vincent & Hicham, 2021). Given the industry's promises of information access, automation, intelligent decision-making, human error avoidance, and more, this is unacceptable. Thus, we propose an operational framework to pose a model of sobriety for data access, consumption, and use (such as in social media or AI agents training) that does not impair performance or accuracy.

Keywords: Sustainable consumption, Green AI & ICT, Eco-design & changing business models, accuracy and sustainability, ecological sobriety

1. Introduction

Social media can support sustainable business and societal practices (Bodin & Prell (Editors), 2011). However, they also lead to excessive resource use, such as data collecting and exchange, digital resource utilisation, and energy consumption (Kamin & Paireekreng, 2018). In 2021, TikTok feeds will utilise 15.81 mAh per minute and produce 2.63 gEqCO₂/min. (Derudder, 2021). Nonetheless, its practices contribute to the current crisis. This demonstrates how challenging it is to reconcile individual and community objectives.

Service providers can continue or avoid interrupting end-user practices by identifying sobriety pools (s-pools) in data use and access.

Sobriety (frugality) is a critical characteristic in energy transition scenarios (Balzani, 2019) and one of the cornerstones of the ecological transition. Existing systems frequently pit energy economy versus performance (Ikhlasse, Benjamin, Vincent & Hicham, 2021). This is unacceptable, given the industry's promises to improve information access, automation, intelligent decision-making, and avoiding human mistakes. The situation is very tense regarding social media and AI (Stein, 2020).

Hence, we propose an operational framework to present a model of sobriety about data access, intake, and utilisation (whether for direct use, such as in social media or agents training in AI) that does not compromise performance or precision.

Accuracy—satisfaction as a response to an expectation or need—is the key to data consumption processes and AI systems (Giese & Cote, 2000). Satisfaction is achieved when the process produces enough output to answer the question without a statistically significant error. A "satisfaction function" meets this imperative. This makes modelling sobriety difficult. As a result, satisfaction is directly related to system production, a function of resource

allocation, which we have mapped using activity best costing (ABC) tools (Ray & Gupta, 1992). This mapping helped us identify the drivers of artificial intelligence activity and test how their variation affected accuracy, the expected deliverable. The ABC approach shows that task and resource allocation both affect satisfaction, but interdependencies and constraints require further analysis. We tested drivers' dependencies, showing that energy consumption was a function of the algorithm and the volume of data used to train the learning system. By stressing interlinkages and tensions, we found that optimal accuracy was achieved when data consumption reached 68% and that further data processing did not increase precision.

Thus, the satisfaction approach allows us to identify sobriety pools and reduce data consumption by 32% by analysing drivers and resource interdependencies without changing the process. Thus, such systems have 32% sobriety potential. This analytical approach, which analyses homogeneous activity drivers, should be portable beyond the proof of concept (Thomas & Gervais, 2010).

Sobriety pits are wasted parts of a production process. Consuming a complementary resource has no marginal utility because it contributes little to the process. After conceptualising these pits, stakeholders must redesign and streamline their industrial processes to eliminate resource waste. This vision aims to identify (1) whether social networks have sobriety pits and (2) how to identify them (and potentially put them into practice).



Figure 1: The sustainable social media challenge

2. Framework

2.1 The Social Media Sobriety Challenge.

This work describes our theoretical framework. Finding sobriety pits requires a deep understanding of the production process (Figure 1).

Why do we produce this way? Why this method? If there is no clear operational and, most importantly, quantified answer to this question—we produce this way because it improves the productivity of x; for example—sobriety pits may be detected at this point in the production cycle. Thus, business routinisation may be hindering cycle productivity, so it may be wise to reassess it (Gibson, 2003).

2.2 Linking production processes, costs, and end-user satisfaction.

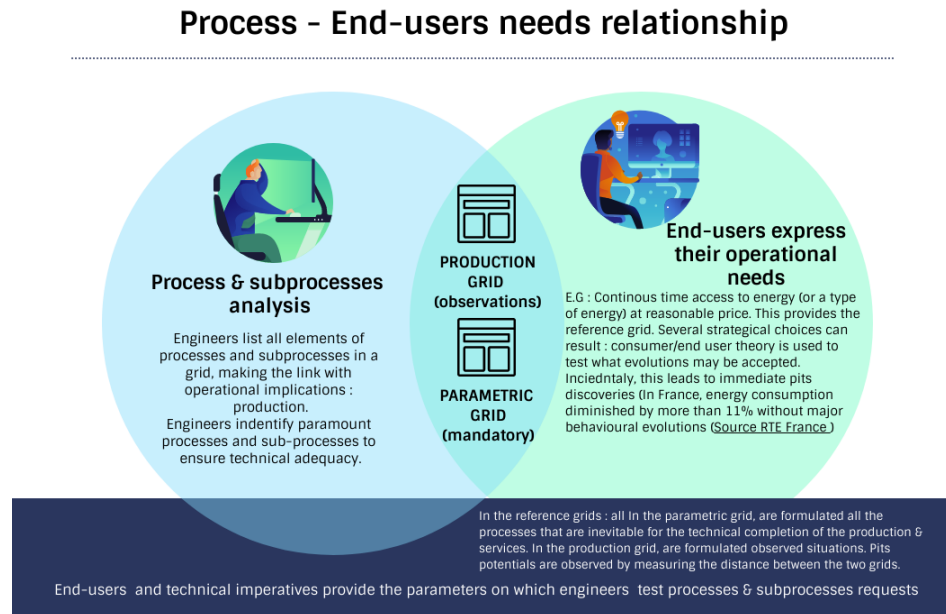


Figure 2: Process – End-Users Relationship

First, we analyse each production cycle's components and subcomponents. Processes are the sum of productive chains. We use requirement engineering to link (Figure 2) end-user expectations with process reality (Cheng & Atlee, 2009). Repertory grids can be used (Sadiq, M., & Jain, 2012). We assume that $f(x)$ and $g(x)$ are parametric grid functions for production and observation variables, respectively.

All necessary production and service processes are formulated in the parametric grid. Production grid situations are observed. Measurements between grids reveal pit potentials.

The ABC (activities best costing) method breaks down activities into cost drivers to determine their financial and operational existence. Activities are processes, and sub-processes are cost drivers (Tsai, 1996). The processes exist if the expenses do, but if they do not, there is a loss and a sobriety pit.

Well-known calculation theorems estimate the area between two curves and between the curve of an odd or even function and the x-axis (Armatte, 2010)

As a reminder, though this might appear trivial, for two functions, $f(x)$ and $g(x)$, where $f(x) \geq g(x)$ on the interval $[a; b]$, the area bounded by the two curves of equations $y=f(x)$ and $y=g(x)$, and the two vertical lines of equations $x=a$ and $x=b$, is given by: $\int_a^b (f(x) - g(x)) dx$

Whereas if $f(x)$ is an odd function, i.e., such that $f(-x) = -f(x)$, then the area bounded by the curve of $f(x)$ and the x-axis in an interval $[-a; a]$ is twice the area between the curve of $f(x)$ and the x-axis in the interval $[0; a]$. More precisely, $\int_{-a}^a f(x) dx = 2 \int_0^a f(x) dx$. The same is true for an even $g(x)$ function, i.e. such that $g(-x) = g(x)$. We have: $\int_{-a}^a g(x) dx = 2 \int_0^a g(x) dx$

For the current analysis, elements where the $f(x)$ curve is above the $g(x)$ curve have a positive algebraic area but involve ideal, i.e., too much use of resources compared to end-user expectations, and inversely, when it is below, the algebraic area is negative, indicating a non-optimal process.

2.3 Explaining satisfaction.

But what about user satisfaction? Economic theory offers three answers: utility, in a cardinal or ordinal reading, or the "choices" theory, which emphasises purchase decisions over satisfaction (Mattei, 2000). However, these three theoretical frameworks assume end-users express satisfaction by arbitrating a price/quantity trade-off (Chiappori, 1990), which is partially observed but not a unique decision point. Product innovation may increase appetite, which is more important than satisfaction.

Consumer satisfaction is called utility. Marginal utility measures the utility change from a one-unit change in consumption/use of a good/service. Such economists (Hugon, 2004) value marginal utility (the scarcity of a good). The utility function is subject to market biases because scarcity can be artificially induced, such as stockpiling mustard seeds in winter 2022 to artificially raise prices (Cuissard, 2023). This neoclassical reading links value to the utility of the last unit exchanged. Gossen's first law (Jolink & Van Daal, 1998) states that consumer desire decreases with each unit consumed. Thus, each subsequent unit has less utility. Marginal utility (first consumed unit) > Marginal utility (second consumed unit) > Marginal utility of n consumed units.

The total utility function shows how the consumer feels when using x units of good X and y units of good Y. The total utility of goods X and Y is $U(x; y)$. Marginal utility is the utility of consuming another good. This is standard. $U_m(x)=U/x$, where U is utility variation and x is good/service variation. Only marginal utility determines price. Pareto and Slutsky (Katzner, 2014) believed utility quantification is more complicated than par ordinal theorists thought. They proposed measuring utility by end-user importance rather than numbers. Substantial rationality underpins this theory. Substantive rationality means people seek maximum satisfaction with minimum resources (at the lowest possible price). This is known as the Ordinal approach.

Both theories assume the consumer is rational and seeks maximum satisfaction or utility. Thus, consumers can use a precise quantitative index to measure their utility from consuming a good/service. This approach is supposed to represent the preferences of economic agents between several options (baskets of goods/services, financial portfolios) over a potentially infinite period, where they all have the same information, all derive satisfaction from their consumption (or use, we speak of positive utility), are limited in their purchasing capacity (they cannot borrow), and allocate all of their money to realising this utility (arbitrage, e.g. investment, distribution). These assumptions rarely hold true. This reading attempts to answer the question: how does an economic agent allocate their budget between goods and services?

Aware of the shortcomings of this approach, economic theory has attempted to develop a "new theory of the consumer" (Barnett, 2003) that emphasises the existence of a consumption process similar to the production process, allowing the consumer/end-user to act with the goal of achieving explicit ends rather than in an impulsive/irrational way whose role is limited to "consuming" goods to satisfy his needs. This view makes household behaviours tangible and objective. However, it has obscured a second novel aspect of the new theory, which is to provide a framework for studying subjective choice formation. This vision is absent from the traditional theory of utility, but it is essential if the consumer must determine his ends and seek information to arbitrate choices (Fustier & Rouget, 1979).

Arbitrage is hence crucial because it drives consumer choice. If two products perform the same function, consumers do not care which one they buy. As long as the services are the same, the latter will accept both a wasteful and an environmentally harmful product. This is the indifference function.

Demonstrating a product/identity service's and functionality can increase end-user acceptance of one choice over another (de Lima Salem & Picot-Coupey, 2020). To maintain satisfaction if the service supports it. Users are committed to satisfaction, not products (Dufer & Moulins, 1989).

Thus, regardless of approach, trade-offs revolve around goods/services availability and price as an attribution of value, all within a volumetric logic (a price corresponds to a given quantity). The Maslovian logic of moving from one state of societal achievement to another and from one product/service life cycle to another never addresses consumer satisfaction but the ability to produce more after buying a product/service.

Our AI work (Gans-Combe, Jun Kim, Mouhali tpb 2023) and social media testing have this meaning. We found the source of economic agent satisfaction. It comes from transitioning from level x to level y in product access through integrated functions. I want to train a fruit recognition algorithm. Only 68% of my database images were used to train the algorithm, but it correctly identifies fruits. My algorithm training requires 68% of the resources. End-user satisfaction is not improved by using more resources. I can deploy this algorithm without consuming resources, as noted ~C. (or non-C). Contrary to theory, utility can be negative. Thus, a sobriety function generates end-user satisfaction from non-consumption. Thus, satisfaction (S) is linked to accessibility (supply chain or a) and product life cycle (existence or e). $S = f(a) + f(e)$. We also know that any product/process service (P) depends on these two functions at the right time (t). $P = \frac{f(a)+f(e)}{t}$ and $S=P/t$.

Thus, end-user satisfaction depends on economic agents' ability to implement processes that meet my needs. Each element of $f(a)$ and $f(e)$ can be broken down into activities, drivers, resources, and costs through “Activity best costing” applied to production (Chea, 2011). We also know we don't need to use all resources to reach a satisfaction level that allows end-users to continue production/usage.

Thus, S and P converge, meet, and diverge at a limit. How do I determine my non-consumption point (my optimum trade-off between satisfaction and efficiency) and decide which variable to satisfy? Safety, deployment simplicity, and (Kitchenham & Pfleeger, 1996). or price trade-off. Three functions converge until the decision point, then diverge.

Adequacy models as arbitrage tools are widely used in AI, but are they applicable to social network architectures?

3. Social media sobriety pits

Social media have a complex sobriety pool detection profile. Their architectures and productive cycles are fragmented and not fully dematerialised (Bossetta, 2018). The diversity of services these structures offer—messaging, video, search, affinity or relevance networking—consume fluids, but not exclusively.

3.1 Complex architectures, but shared resources needs.

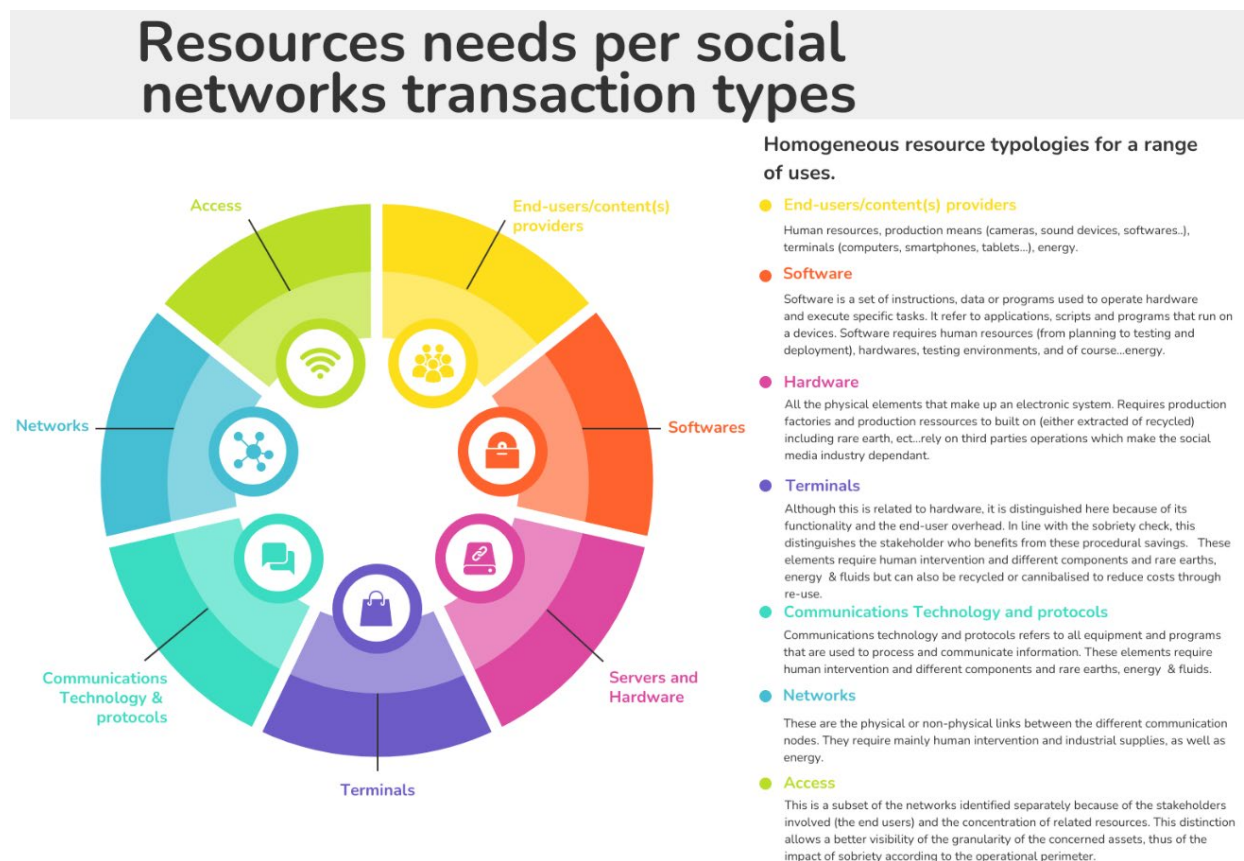


Figure 3: Resource needs per social networks transaction types

Indeed, without the physical media that enable their distribution—smartphones, computers, etc.—none of these tools or offers would exist (networks, servers, but also algorithmic capacities, etc.). Despite their energy needs, these offers incrementally consume rare earth, human resources, and programmatic skills (see Figure 3 - resource needs per social networks transaction types).



Social media resources needs cycle.

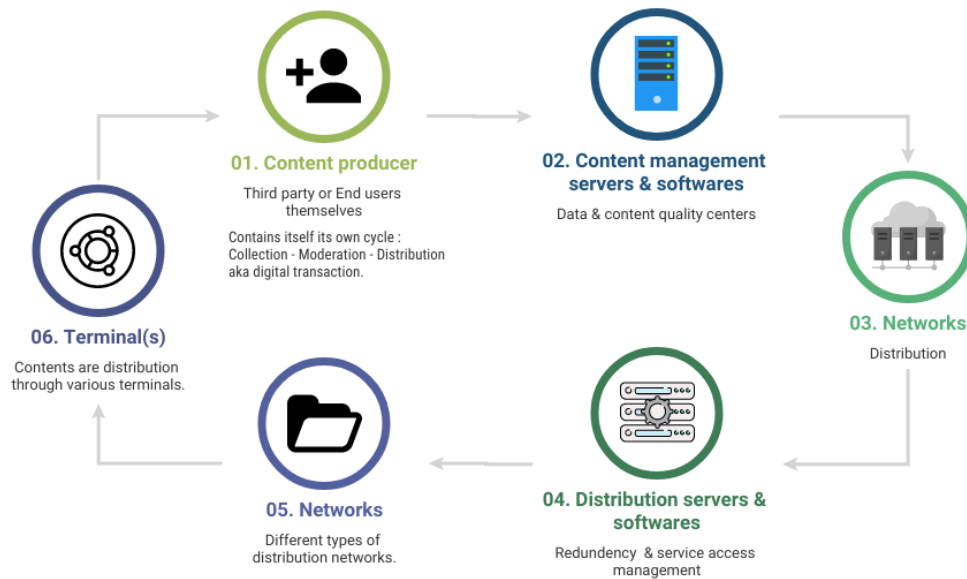


Figure 4: Social media resources needs cycle

However, resource analysis shows a homogeneity of goods and services needed to build, implement, and deploy this type of service (Figure 4).

We have a resource-only backend for multiple frontends. Resource concentration, according to stakeholders, differentiates resource needs. Thus, from the perspective of sobriety and the model to be implemented, knowledge of a process associated with business concentration ratios could help identify areas for improvement by establishing business resource profiles.

3.2 Social media and digital "overconsumption"

This accumulation of usages (Figure 4) affects resources, their use, and the planet (Kliem & Kao, 2015). "Digital over-consumption" refers to a connected device's life cycle's environmental impact. From manufacturing to disposal, a device emits CO₂, creates waste, and degrades biodiversity. Every end-user action—using an app, sending an email, or watching a video—impacts the environment. Three factors affect this.

3.2.1 Digital device production.

Connected devices use 79% water and fossil fuels. This process pollutes the earth and accounts for 70% of France's digital technology's carbon footprint. Smartphones require global imports of lithium, gold, and metal. Transport increases CO₂ emissions. Miniaturization may not work because smaller components require more energy, rare metals, and chemicals to make (Barney, 1995).

3.2.2 Communication infrastructure operations

"Pipes" and social media overconsume content, which must be stored in clouds or data centres. Since they need coolants and electricity to run, these massive physical storage centres pollute a lot (Rong, Zhang, Xiao, Li & Hu, 2016). In 2021, social networks used 30% of global data centre electricity, which was 220-320 TWh or 0.9-1.3% of global final electricity demand (IEA, 2022). In 2021, cryptocurrency mining consumed 100-140 TWh: "Over the past several years, large data centres have used 10-30% more energy due to rapid workload growth. Data centre energy use (excluding crypto) is expected to grow moderately in the coming years, but longer-term trends are uncertain. Coolants are another example (including water: Mytton, 2021).

3.2.3 Equipment's' End-of-life.

A recent study (Magazzino, Mele, Morelli & Schneider, 2021) examined the link between poorly deployed information and communication technologies and waste ending up in open dumps where some raw materials cannot be recycled due to infrastructure or design issues.

4. Recalculating to find sobriety pits

According to the global web index (GWI 2022), personal (the primary use) and economic imperatives drive social media use and growth (job search, visibility) ... It is about sharing interesting content with friends or strangers (Krishen, Berezan, Agarwal & Kachroo, 2016) or showing activism. These social tools are among the most widely used (Pearce, Niederer, Özkula, & Sánchez Querubín, 2019).

Overconsumption is obvious: 4.33 billion mobile users consume 262 million Tons of EqCO₂ per year, accounting for 0.61% of global EqCO₂ impacts in 2019 and 56% of France's carbon emissions. Additionally, superimposing social network layers requires additional energy and resources. Thus, TikTok leads with 15.81 mAh/min, followed by Facebook (12.36) and Snapchat (11.48). These use 10% of France's annual electricity consumption. The energy efficiency of established platforms like LinkedIn, YouTube or Instagram would be interesting to investigate as they use the least energy while being quite client efficient.

Maintaining the user experience while finding a critical path for improving the links between production layers that could lead to sobriety is the challenge. Thus, intimate knowledge of social network production processes is essential.

What makes a social network? Schematically this is known, but in detail, this is less evident. In contrast, detecting areas of sobriety requires this knowledge, the ability to identify in a production process when the resource is overused in relation to the expected customer experience.

Therefore, any actor tempted by an approach to make its production practises lean should first question the auditors to see if they can do this work. This requires a detailed understanding of each social network's productive continuum, which breaks down each product/service into activities and cost drivers using accounting standards guidelines. Without a clear picture of the processes and their costs, it seems compromised to look for resource usage savings.

It is worth repeating that the customer experience determines a user's satisfaction with using a social network, even to satisfy useless needs. According to research, Twitter loses 0.5% of its daily users monthly, directly impacting customer experience (Stokel-Walker, 2022).

Thus, even elites use social media for satiety and psychological belonging (Bao, Sun, Han, Lin, and Lau, 2023). They are also very high on the Maslovian scale (Ghatak and Singh, 2019). Due to overconsumption and customer experience, the social media ecosystem seems like a textbook example of how to find sobriety pits. However, we must consider resource stacking. Establishing a model on a horizontal process is different from analysing this issue in a chain of N superimposed functionalities or N consecutive processes. N is 6.

We previously demonstrated that sobriety lies in optimising a process while satisfying the end user. At least six simultaneous processes satisfy social media users. Therefore, it is necessary to identify the points of convergence of these processes to express them in a way that makes the search for sobriety wells possible in a continuous manner (in a single approach) rather than subsequently, which would make the analysis tedious. Restate: $S = P/t$ with: $P = \frac{f(a)+f(e)}{t}$. This expresses social media satisfaction. $S = \sum_{i=0}^5 \frac{P_i}{t}$

P2's resource knowledge is limited to what is not in P1 and later. If the usage structure of the previous resource phase is known, only the unknown elements need to be explored, greatly reducing the work. The resources are used concurrently in phase t.

So: $P = \frac{f(a)+f(e)}{t}$

$$P_1 = \frac{(f(a) + f(a_1)) + (f(e) + f(e_1))}{t} = \frac{f(a) + f(e)}{t} + \frac{f(a_1) + f(e_1)}{t}$$

(...)

$$P_6 = 6 \frac{f(a) + f(e)}{t} + 5 \frac{f(a_1) + f(e_1)}{t} + 4 \frac{f(a_2) + f(e_2)}{t} + 3 \frac{f(a_3) + f(e_3)}{t} + 2 \frac{f(a_4) + f(e_4)}{t} + \frac{f(a_5) + f(e_5)}{t}$$

$$P_6 = 6P + 5 \frac{f(a_1) + f(e_1)}{t} + 4 \frac{f(a_2) + f(e_2)}{t} + 3 \frac{f(a_3) + f(e_3)}{t} + 2 \frac{f(a_4) + f(e_4)}{t} + \frac{f(a_5) + f(e_5)}{t}$$

This shows that social media users' needs and resources are redundant. Finding and discarding these unnecessary items may lead to sobriety pits.

5. Deploying the model: a ten components example.

Suppose a network consists of n components, each of which corresponds to a given use of resources (monetary or otherwise). Let the marginal utility (μ) of each component be given by:

$$\mu_1 = x - y \times Q_1$$

$$\mu_2 = x - y \times Q_2$$

...

$$\mu_n = x - y \times Q_n$$

where x and y are constants and Q_i is the quantity of component i consumed. Here, x and y are treated as constants to simplify the mathematical representation and analysis of the problem. Constants being fixed values that do not change within the context of the problem being analyzed, they are in the present case used to represent the underlying factors or characteristics of the components in the network that remain consistent across all components. If the costs of products i are given by C_i , and the resources (budgetary or else) constraint is fixed at R, then, to find the end user equilibrium, we need to set the marginal utility per monetary unit (let say euros) spent on each component equal to each other and tending to 0. This gives us the following equation:

$$\frac{\mu_1}{C_1} = \frac{\mu_2}{C_2} = \dots = \frac{\mu_n}{C_n}$$

$$\frac{((x - (y \times Q_1)))}{C_1} = \frac{((x - (y \times Q_2)))}{C_2} = \dots = \frac{((x - (y \times Q_n)))}{C_n}$$

Solving for Q_i , we get:

$$Q_i = \frac{(x - (C_i \times \mu_i))}{y}$$

Substituting this expression for Q_i into the resources' constraint: $C_1 Q_1 + C_2 Q_2 + \dots + C_n Q_n = R$

We get:

$$\frac{C_1(x - (C_1 \times \mu_1))}{y} = \frac{C_2(x - (C_2 \times \mu_2))}{y} = \dots = \frac{C_n(x - (C_n \times \mu_n))}{y} = R$$

Now, we can solve for C_i in terms of R. This gives us the resources that will set the marginal utility vector to zero:

$$C_1 = \frac{((x - (y \times \mu_1)) \times R)}{(x * y + y * \mu_1 + y * \mu_2 + \dots + y * \mu_n)}$$

$$C_2 = \frac{((x - (y \times \mu_2)) \times R)}{(x * y + y * \mu_1 + y * \mu_2 + \dots + y * \mu_n)}$$

...

$$C_n = \frac{((x - (y \times \mu_n)) \times R)}{(x * y + y * \mu_1 + y * \mu_2 + \dots + y * \mu_n)}$$

Thus, we have demonstrated the pathway to set the marginal utility vector to zero in the context of a network with n components. In general, the end-user equilibrium condition can be used to find the costs that will set the marginal utility vector to zero for any network with n components.

As explained before, ABC gives us the precise costs for each component of a network. By comparing the calculated marginal utilities and the real costs, we can establish the optimal quantity of resources necessary to satisfy the users, and the distance between the real costs observed and this optimum. It is in this interval, which is repeated for each network, that the wells of sobriety can be found, making it possible to perpetuate user satisfaction with the services offered while improving operational margins.

Let us now assume that there are two production pathways resulting in the same service, each composed - for the purpose of this example - of ten components. These methodologies ultimately provide the same service, and each pair of components performs the same service: component 1 of set 1 delivers the same service as component 1 of set 2. We note that this approach is valid for n elements as mentioned above, but we limit the number of components for the purpose of the example. Each service component has its own balanced marginal utility, i.e., the point where users get what they want for a given resource usage (which can be monetary or otherwise). Comprehensive Activity-Based Costing (ABC) matrixes provide for each component used in a digital service, on one hand the volume of resource used, and on the other hand the associated costs (Shaffi & Al-Obaidy, 2013). The process consists of eight essential steps. initially pinpointing the primary activities within the network that contribute to overall costs, such as servers setup, service quality, and more as well as determine the cost objects, which are the products or services for which costs will be allocated (Kamiya, 2020). Next, the identified activities are categorized into cost pools to ascertain a cost driver for each cost pool. After calculating the total cost of each cost pool by aggregating the associated direct and indirect costs of the activities within the pool, an activity rate can be derived by dividing the total cost of each cost pool by the total quantity of the cost driver.

With this information, a matrix can be formulated wherein rows symbolize cost pools and columns represent cost objects. Within each cell, input the product of the activity rate for the corresponding cost pool and the quantity of the cost driver utilized by the cost object. Subsequently, for every cost object, the allocated costs must be consolidated from all cost pools to derive the total indirect cost for that particular object.

Finally, direct costs must be combined with the allocated indirect costs from the Activity-Based Costing matrix to ascertain the total cost for each cost object.

By comparing the costs and marginal utilities of the components in the two production pathways, we can determine the most efficient pathway to achieve the desired level of user satisfaction while minimizing resource consumption. This analysis can help organizations optimize their service offerings, reduce waste, and ultimately improve their bottom line.

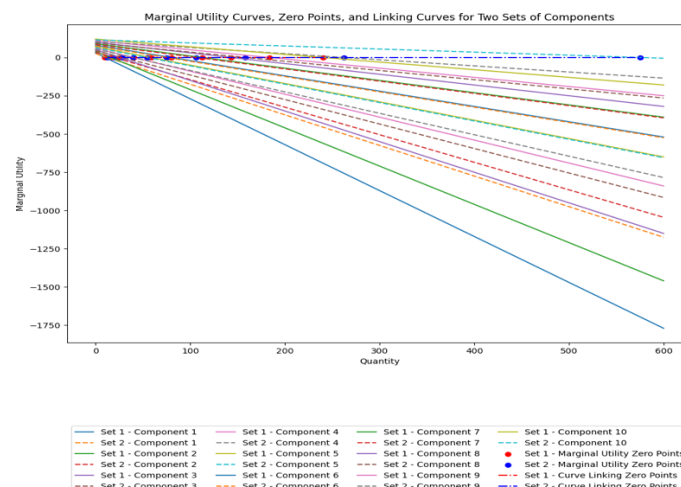


Figure 5: Marginal utility curves and links for two sets of resources components used in a network production process.

From these elements we calculate (Figure 5):

(1) the marginal utility of each component. This allows us to demonstrate that - for an identical activity - one set of components requires significantly more resources than another, the marginal utilities for components 5 and 10 of the second set being above 250 resource units,

(2) the distance between marginal utilities of each set (or couple) of components with a given volume. This approach makes it possible to carry out an arbitration between components, thus, to test the subsidiarity of the components, which is called homogeneity in economics. Having done this, we can extrapolate the optimal component basket to render the desired service, thus highlighting both the sobriety wells per component and components group.

We note that in our example, the marginal utility holding towards 0 is fast reached, which indicates an important propensity of the networks processes to waste resources if not optimized.

6. Recommendation as conclusion

Due to technical layers and different expectations and operations in comparable instruments, streamlining industrial methods for resource consumption efficiency in the social media industry is complex. They combine institutional and family communication, and commercial and personal interests on the same platforms. This operational confusion results in polymorphous expectations, which serve as a vector for resources over usage. In fact, the more numerous and diverse the expectations, the more the associated processes are plagued by the same flaws, as demonstrated above.

Consequently, there are multiple satisfaction curves with increasing expectations. The modeller's response can only be matrix-based in this instance. Also, in such a framework, work on harmonising processes and expectations appears necessary, mainly because we can observe that the social media platforms with the most dedicated channels are the ones that have discovered their economic model and are the most environmentally responsible (Dunia, Rambe & Fauzi, 2018, March).

References

- Armatte, M. (2010). La science économique comme ingénierie: quantification et modélisation. Presses des mines.
- Balzani, V. (2019). Saving the planet and the human society: renewable energy, circular economy, sobriety. *Substantia*, 3(2), 9-15.
- Bao, X., Sun, B., Han, M., Lin, H., & Lau, R. Y. (2023). Quantifying the impact of CEO social media celebrity status on firm value: Novel measures from digital gatekeeping theory. *Technological Forecasting and Social Change*, 189, 122334.
- Barney, J. B. (1995). Looking inside for competitive advantage. *Academy of Management Perspectives*, 9(4), 49-61.
- Barnett, W. (2003). The modern theory of consumer behavior: Ordinal or cardinal?. *The Quarterly Journal of Austrian Economics*, 6(1), 41-65.
- Bisio, I., Delfino, A., Lavagetto, F., & Marchese, M. (2014). Opportunistic Detection Methods for Emotion-Aware Smartphone Applications. In B. Guo, D. Riboni, & P. Hu (Eds.), *Creating Personal, Social, and Urban Awareness through Pervasive Computing* (pp. 53-85). IGI Global. <https://doi.org/10.4018/978-1-4666-4695-7.ch003>
- Bodin, Ö., & Prell, C. (Eds.). (2011). *Social networks and natural resource management: uncovering the social fabric of environmental governance*. Cambridge University Press.
- Bossetta, M. (2018). The digital architectures of social media: Comparing political campaigning on Facebook, Twitter, Instagram, and Snapchat in the 2016 US election. *Journalism & mass communication quarterly*, 95(2), 471-496.
- Brugnach, M., & Ingram, H. (2012). Ambiguity: the challenge of knowing and deciding together. *Environmental science & policy*, 15(1), 60-71.
- Burns-Stanning, K. (2020). Identity in communities and networks TikTok social networking site empowering youth civic engagement. In *The 11th Debating Communities and Networks Conference* (Vol. 27, pp. 1-11).
- Chea, A. C. (2011). Activity-based costing system in the service sector: A strategic approach for enhancing managerial decision making and competitiveness. *International Journal of Business and Management*, 6(11), 3.
- Cheng, B. H., & Atlee, J. M. (2009). Current and future research directions in requirements engineering. In *Design Requirements Engineering: A Ten-Year Perspective: Design Requirements Workshop*, Cleveland, OH, USA, June 3-6, 2007, Revised and Invited Papers (pp. 11-43). Springer Berlin Heidelberg.
- Chiappori, P. A. (1990). La théorie du consommateur est-elle réfutable?. *Revue économique*, 1001-1025.
- Cuissard, O. (2023). La régulation des marchés agricoles et des ressources naturelles, entre financiarisation et interventions publiques. *Transversalités*, (1), 127-135.

- De Lima Salem, V., & Picot-Coupey, K. (2020). The adoption of responsible behaviors in food consumption-the case of Brazilian consumers (Doctoral dissertation, IAE France).
- Derudder, K. (2021). What is the environmental footprint for social media applications?. Greenspector. October, 26, 2021.
- Dufer, J., & Moulins, J. L. (1989). La relation entre la satisfaction du consommateur et sa fidélité à la marque: un examen critique. *Recherche et Applications en Marketing (French Edition)*, 4(2), 21-36.
- Dunia, A. I. M., Rambe, A. H., & Fauzi, R. (2018, March). Measuring the power consumption of social media applications on a mobile device. In *Journal of Physics: Conference Series* (Vol. 978, No. 1, p. 012104). IOP Publishing.
- Fustier, B., & Rouget, B. (1979). La nouvelle théorie du consommateur est-elle testable? (Doctoral dissertation, Institut de mathématiques économiques (IME)).
- Ghatak, S., & Singh, S. (2019). Examining Maslow's hierarchy need theory in the social media adoption. *FIIB Business Review*, 8(4), 292-302.
- Gibson, C. (2003). Cultures at work: Why 'culture' matters in research on the 'cultural' industries. *Social & Cultural Geography*, 4(2), 201-215.
- Giese, J. L., & Cote, J. A. (2000). Defining consumer satisfaction. *Academy of marketing science review*, 1(1), 1-22.
- Hugon, P. (2004). The Boundaries of the Competitive Order and the Market: Global Public Goods and the Commons. *Geography, Economy, Society*, 6, 265-290. <https://doi.org/10.3166/ges.6.265-290>
- IEA (2022), Data Centres and Data Transmission Networks, IEA, Paris <https://www.iea.org/reports/data-centres-and-data-transmission-networks>, License: CC BY 4.0
- Ikhlas, H., Benjamin, D., Vincent, C., & Hicham, M. (2021). Recent implications towards sustainable and energy efficient AI and big data implementations in cloud-fog systems: A newsworthy inquiry. *Journal of King Saud University-Computer and Information Sciences*.
- Jolink, A., & Van Daal, J. (1998). Gossen's laws. *History of political economy*, 30(1), 43.
- Kamin, P., & Paireekreng, W. (2018, July). Modelling carbon footprint on smartphone usage for social networking. In *Proceedings of the 2018 International Conference on Data Science and Information Technology* (pp. 59-63).
- Kamiya, G. (2020). Data centres and data transmission networks. IEA Databases last accessed 19/04/2023. <https://www.iea.org/reports/data-centres-and-data-transmission-networks>
- Katzner, D. W. (2014). Ordinal utility and the traditional theory of consumer demand. *Real-world Economics Review*, (67), 130-136.
- Kitchenham, B., & Pfleeger, S. L. (1996). Software quality: the elusive target [special issues section]. *IEEE software*, 13(1), 12-21.
- Knight, K. W. (2016). Public awareness and perception of climate change: a quantitative cross-national study. *Environmental Sociology*, 2(1), 101-113.
- Krishen, A. S., Berezan, O., Agarwal, S., & Kachroo, P. (2016). The generation of virtual needs: Recipes for satisfaction in social media networking. *Journal of Business Research*, 69(11), 5248-5254.
- Kliem, A., & Kao, O. (2015, December). The Internet of Things resource management challenge. In *2015 IEEE International Conference on Data Science and Data Intensive Systems* (pp. 483-490). IEEE.
- Magazzino, C., Mele, M., Morelli, G., & Schneider, N. (2021). The nexus between information technology and environmental pollution: Application of a new machine learning algorithm to OECD countries. *Utilities Policy*, 72, 101256.
- Mattei, A. (2000). Théorie du consommateur. Dans : , A. Mattei, Manuel de micro-économie (pp. 4-69). Genève: Librairie Droz.
- Mytton, D. (2021). Data centre water consumption. *npj Clean Water*, 4(1), 11.
- Pearce, W., Niederer, S., Özkula, S. M., & Sánchez Querubín, N. (2019). The social media life of climate change: Platforms, publics, and future imaginaries. *Wiley interdisciplinary reviews: Climate change*, 10(2), e569.
- Ray, M. R., & Gupta, P. P. (1992). Activity-based costing. *Internal Auditor*, 49(6), 45-52.
- Rong, H., Zhang, H., Xiao, S., Li, C., & Hu, C. (2016). Optimizing energy consumption for data centers. *Renewable and Sustainable Energy Reviews*, 58, 674-691.
- Sadiq, M., & Jain, S. (2012, December). An insight into requirements engineering processes. In *Third International conference on advances in communication, network and computing*.
- Shaffi, A. S., & Al-Obaidy, M. (2013). Managing network components using SNMP. *International Journal*, 2(3), 2305-1493.
- Stein, A. L. (2020). Artificial intelligence and climate change. *Yale J. on Reg.*, 37, 890.
- Stokel-Walker, C (2022). Twitter may have lost more than a million users since Elon Musk took over. MIT Technology review November 3, 2022 <https://www.technologyreview.com/2022/11/03/1062752/twitter-may-have-lost-more-than-a-million-users-since-elon-musk-took-over/> Consulted January 16th 2023
- Thomas, C., & Gervais, M. (2010). Overhead Allocation Dilemma: How to Reconcile Homogeneity with Simplicity. Available at SSRN 1659808.
- Tsai, W. H. (1996). Activity-based costing model for joint products. *Computers & Industrial Engineering*, 31(3-4), 725-729.

Cyberbullying of Children: The role of Parental Response

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Abstract: Cyberbullying of children has been studied in many disciplines, e.g. psychology, education, criminology, information systems. However, much of the work consists of guidelines and only about half is empirical. Plus, the empirical research seldom has a sound, well-formulated theoretical underpinning. Although guidelines generally indicate what parents should do to prevent cyberbullying of their children, there is a paucity of research on how parents actually respond and what effect this has on their children. With all the best intentions in the world, very often parents may be responding inappropriately, thereby extending the bullying cycle and exacerbating the harm of the cyberbullying. The purpose of this qualitative research was exploratory and was to determine how parents respond to their children being cyberbullied. The research captured the interview responses of ten pairs of child/parent combinations, identified by means of purposive sampling. In particular, the responses of the parent to a cyberbullying incident involving their child were explored. The responses of each pair were compared to ascertain the role of the parental response, and then a more holistic thematic analysis was conducted of all the pairs of responses. Some of the findings indicate confusion about what exactly cyberbullying is; who believed that they/their children had experienced cyberbullying; what the experience had been; prior parental guidance of the children; who the children had told when they experienced cyberbullying; which parents had been told (if they were told) and why; how parents believed they had responded and how their children perceived them to have responded; the children's response to their parents' response; and the result of the cyberbullying incident discussed. This research contributes to the theoretical development of cyberbullying by building on a combination of self-discrepancy theory, social cognitive theory and parental mediation theory. In practical terms, the research will shine a light on an overlooked area of cyberbullying research. The findings will help guide parents, schools and counselors on how best to involve parents in the child's response to cyberbullying.

Keywords: Cyberbullying, Children And Cyberbullying, Parental Responses; Cyberbullying Guidelines, Parent/Child Pair Interviews

1. Introduction

Cyberbullying has become one of the scourges of the online world, often leading to suicide and lesser forms of self-harm, depression and considerable family upheaval. Children have been particularly susceptible to cyberbullying and the topic has been studied in many disciplines, e.g. psychology, education, criminology, and information systems. However, much of the work consists of guidelines and only about half is empirical. Plus, the empirical research seldom has a sound, well-formulated theoretical underpinning.

Although guidelines generally indicate what parents should do to prevent cyberbullying of their children, there is a paucity of research on how parents actually respond to such cyberbullying and what effect this has on their children. With all the best intentions in the world, very often parents may be responding inappropriately, thereby extending the bullying cycle and exacerbating the harm of the cyberbullying. This research aimed to ascertain how parents responded to their children being cyberbullied – and whether there were differences between parents' perception of their responses and their children's perception of those responses.

The research reported in the following sections, records an initial exploration into the impact of parental responses to their children being cyberbullied.

2. Literature Review

There are many definitions of cyberbullying but one that seems to capture the most important elements is: Cyberbullying refers to the deliberate and hostile behaviour intended to hurt or harm people using the Internet and more particularly, social media (Limber, 2012; Smith et al, 2008). Cyberbullying can take many forms, and although greatly facilitated by social media, it is not limited to those channels and can comprise any online communication. There are two main types of cyberbullying: cyber-harassment and cyberstalking (Lowry et al., 2016) but there are also other types such as identity theft, sexting, grooming, impersonation, flaming and exclusion (Notar et al., 2013). Often the bullying is prompted by some outstanding characteristic of the victim (Notar et al., 2013). The online environment has been seen as being more conducive to bullying than the offline environment because of the relative absence of family supervision (Goodyear et al., 2018). Plus, it provides greater volume, scale, scope and number of participants (Gillespie, 2006), and it involves perceived anonymity, lack of identification, diffused responsibility, lack of proximity, knowledge of others (Lowry et al., 2016), and an underlying disinhibition which leads to greater aggression (Suler, 2004).

Children are particularly vulnerable to cyberbullying and can suffer moral disengagement, lower cognitive and affective empathy (Lei et al., 2020), depressive symptoms (Turliuc, 2020), loss of confidence, sadness, powerlessness, fear (Hoff & Mitchell, 2009) and even self-harm and suicidal behaviour (Martin-Criado et al., 2021).

The family context has been seen as one of the most influential factors in dealing with cyberbullying. Parental styles, excessive control, and little involvement present risks for children whereas affection, trust and fluid communication are related to more competent, safer children (Martin-Criado et al., 2021). Martin-Criado et al. (2021) determined that parental knowledge of the cyberbullying environment as well as their {technical} competence in this regard, had a significant influence on positive parental involvement. Ho et al. (2020) identified four types of parental mediation of their children's social media activity: active mediation (open discussions about how to behave online and what the children might have encountered), restrictive mediation (limiting social media activity), authoritarian surveillance (monitoring children's social media accounts and activity) and non-intrusive inspection (occasional monitoring of children's open posts but not private conversations).

A certain amount of responsibility has also been assumed by schools and together with the parents they attempt to deal with the cyberbullying problem. However, there are varying reports of how effective schools are – often their area of influence is curtailed by the realm of their authority (Hoff & Mitchell, 2009).

Although there has been a marked lack of reference to theoretical underpinnings in many of the studies on cyberbullying, those that did feature prominently were: social learning/cognitive theory – that learning occurs in a social context and involves the interaction between people, their environment and their behaviours (Bandura, 2002); parental mediation theory – that parents use different strategies to negate harmful media effects (Clark, 2011); and self-discrepancy theory – that there are different domains of the self (the actual self as one presents to others, the ideal self as one would like to present to others, and the ought self as one should present to others) and the true self (the uncensored self) (Ho et al., 2020).

3. Research method

The research was exploratory and consisted of qualitative interviews of ten pairs of parent/children (11-18) combinations, identified by means of purposive sampling. In total 20 individual interviews were conducted with each parent and child being interviewed consecutively with no opportunity for collusion in between. Each participant was assured of the confidentiality of their responses so children, especially, felt free to discuss matters they might not have discussed with their parents. The transcripts of the interviews were first analysed in parent/child pairs and then all transcripts together so as to gain a more holistic, thematic reflection of the response patterns.

4. Findings

The interviews started with an explanation of the concept of cyberbullying. However, rather than limiting the activity to online, our explanation of cyberbullying had to be adjusted to make allowances of the fact that while the bullying might be initiated online, very often it spun off to the offline world, and vice versa.

Another issue was that very often the “victims” didn't know or realise whether they were being bullied or not. Bullying is often in the mind of the perceiver or experiencer. What some people might interpret as bullying might be regarded as acceptable behaviour within a certain context. For instance, Philip plays games online and within the games they taunt one another. Upon overhearing such “trash talk” John, his father, became concerned and discussed the situation with Philip. However, the latter responded: “we know we're good friends we give each other as good as we get”. Hamish, too, had initially been of the opinion that “they were just doing it [teasing/taunting] because they said it was a game”.

In other instances, behavioural norms within a group indicated potentially insulting/harmful behaviour. Thus, in Mary's case, a practice developed within her group of friends of “insulting” one another. Initially uncomfortable with the practice Mary eventually followed suite and then obviously overstepped the mark and became the victim of a long and vicious bullying campaign that extended way beyond that group of friends. Tracey referred to a “trend of posting a picture of yourself online with the caption: “Say anything you want to me”. In itself, such behaviour is potentially very harmful but becomes even more so when other people post pictures of those they wish to bully with a similar caption.

Another aspect of cyberbullying is that the actual bullying can take many forms simultaneously. It can be direct – as in the case of hurtful messages being posted to the victims online, or hurtful things being said about them online, for instance, during Zoom class sessions or in posts online about the victim but from which the victim is excluded. Then there is the exclusion from group activities – those planned and executed offline and those conducted solely online. Many children reported such bullying.

4.1 Social media guidance by parents

Most of the parents interviewed exercised some sort of monitoring of their child's social media and general online activity. Although initially embarked upon and pursued diligently, very soon many of them realised that it was just too time-consuming and gave in to the position of random sampling of their child's online activities. Alternatively, they rationalized their scaled down approach by arguing that they did not want to intrude upon their child's privacy and/or trusted their child not to do anything untoward or risky. Usually, if there were a number of children in a family, parents would be strictest with the eldest and by the time it got to the other children, any monitoring had become far less strict and intrusive.

"Some parents monitor everything their children receive and send [but] it's an issue of privacy. All my friends would always hate it" (Sally).

"They've never been really strict on social media" (Nicola).

4.2 Main incident

With regard to the main cyberbullying incident upon which each participant reported, often the cyberbullying started during Covid lockdowns – and continued long after the lockdowns. The online environment facilitated the wide reach of negative messages about the victim so that by the time Covid lockdowns were lifted and children could return to school physically, in Mary and Tracey's cases, hundreds of students had already decided to have nothing to do with them and they were ostracised during break times and during any socialization opportunities. Eventually both changed schools.

Hamish also experienced an extended period of bullying. "It was over a period of years that it was happening" (Jane).

"I don't think it would have persisted to the extent that it did, had they had face-to-face contact. So I think they were hiding behind that screen" (Sue).

4.2.1 Why were the children bullied?

The bullying occurred for a number of reasons, most frequently because the victim manifested some outstanding characteristic. In many cases it was because of physical shape – a particularly thin and unathletic type of boy, a fat girl – or, on the other hand, a particularly beautiful girl, or an especially bright child.

"It's like a physical thing. They just kind of assume things about him because he isn't a sporty child" (Jane).

Often risky behaviour, according to Sally, and particularly among girls, was to post nude or similarly risky photographs of themselves on social media in the hopes of attracting a certain boy's attention and interest. Using platforms such as Snapchat, which didn't apparently store such postings, ensured that their parents' checking wouldn't detect such provocative and risky behaviour.

4.2.2 Feelings about being bullied

The range of emotions experienced by the victims ran from anger to sadness and distrust.

"I kinda felt annoyed. More angry or annoyed, but not like sad" (Justin).

"I feel sad, and I feel angry at the person for bullying me and getting away with it. I also feel sad because I thought they were my friend" (Hamish). Hamish's mother, Jane's, perception was that "it got under his skin and really started to affect his mental health".

Mary recounted that "I was very confused. I wasn't quite sure what I had done so wrong. It made me feel betrayed.... It just showed me not to trust everyone as well. It kind of gave me trust issues". Mary's mother, Sue, reported that she personally felt "Terrible. Heartbreaking. It was heartbreaking for her".

Tracey's mother, Bronwyn, indicated: "It was awful. She just kind of shut down. It was hard for her to go to school every day. Tracey was devastated."

A number of victims, like Brit, responded that they were frustrated by the protective shield provided by the computer screen. They were certain that the bullying would not have been so severe had the bully been able to immediately observe the hurt they were causing the victim, as in the offline environment.

4.2.3 *Confiding*

Not all the children confided in their parents, or did so as soon as the bullying started. Some preferred to discuss it with their friends first but none confided in their siblings – often because they were the eldest and didn't want to upset them. John noted that his son, Philip, wouldn't tell his older sister because the latter often teased him and he would want to avoid that. Anna reported that she confided in her dog. This was because they had a large family and the child felt that there was enough going on for their parents to deal with.

Usually the personality of the parent, the closeness of the parent/child relationship, and also the gender similarity dictated in which parent the child confided – or confided in first. So, for instance, Nicola preferred to tell her mother "because she's told me more about her friendship dramas when she was a kid, so I think she's able to relate a lot more than my dad, plus she is also a female".

However, Hamish, Mary and Tracey all preferred to tell their fathers because of the calmer, less emotional responses of the latter. Another reason for preferring to tell the father is because the mother's lack of technical (IT) knowledge – "she almost doesn't know how to handle it" (Sally). On the other hand, Justin indicated: "Probably my mom because my dad is very against me doing anything at all. He thinks that everything I do is completely my fault".

Sometimes, though, it is simply a matter of which parent the child encounters first that dictates who is told. Hamish's mother, Jane, collects him from school every day and she immediately queries him on his day at school so he tells her everything and then she tells his father later.

On the other hand, often children don't tell their parents immediately. Initially Mary kept the matter to herself but her mother noticed that she was upset and irritable with her siblings. Frequently it's a case of the child trying to be grown-up and cope with their problems on their own, or, as Max noted, "they don't necessarily say everything" because children don't want possibly risky things that they might have done being exposed and then having their mobile phones taken away from them". By and large parents believed that their children told them about 70-80% of the full story of their cyberbullying victimisation.

4.2.4 *Parental response*

When Mary first told her mother, Sue, the latter "just started shouting. She was ready to email the school immediately and I had to calm her down" Mary went on to explain that at the time she hadn't thought it was such a big deal but "I didn't realise how serious it was". However, Sue's memory was slightly different and that initially she was wanting to see the full perspective. "I wanted to see what the other side of the story was because there are always two sides to the story".

Bronwyn was "so furious. I was like "What did you do? What the hell is this? ... and then when I take a step back, I realize that it wasn't actually her and I should be furious with the other person and then I just want to cuddle her. And unfortunately, sometimes that trust has gone a bit because she's been crapped on".

Nicola reported that her mother's approach was to "just ignore it" and that she'd "probably get rid of some of my social media" whereas her father "probably would have said: 'talk to your mom'".

Steve reported that he "didn't want to be too controlling and that ... kids need to be encouraged to take responsibility for their own lives". This resulted in Anna not confiding in anybody and trying to deal with the situation on her own, albeit a very painful experience for her.

On the other hand, Brit's mother simply enveloped Brit in hugs and sympathy – no hint of blame, just unconditional positive regard. "Brit knows that I'm always there for her to come and talk to, and that I'm on her side, and she's number one" (Diana).

Hamish also felt very supported - "Then my mom writes an email to the school. I think she really cares about me" (Hamish).

4.2.5 Response of third parties

On occasions, the parent(s) of the victim, would seek recourse with the bully and his/her parent(s). However, such meetings were usually unsatisfactory.

“My mom usually talks to the parents of the other child and they just say ‘Oh, what am I gonna do about it?’” (Hamish).

While Nicola thought her father didn’t understand much about girls’ relationships, Mark actually arranged a meeting between the bully and her parents, and Nicola (the victim), his wife and himself. According to Mark, Nicola’s response was “worried because she had said things she wasn’t proud of as well as that she was going to get into trouble ... She was probably hoping that it would blow over because she didn’t want to jeopardise losing a friend”. The bully and her parents were apologetic “but it was obvious the friendship was over”.

More often than not, parents of victims would seek recourse with the school. Some were very good and responsive. Usually these schools had a very progressive and detailed strategy of dealing with bullying - and enforced it effectively.

Some schools tried but weren’t really effective. “The system isn’t set up really to support these children so [the school] tries to be mature about it – so, we’re all going to reconcile and come together in a room and talk about it and then leave feeling better about ourselves but the reality is the children are not actually mature enough” (Sue). It simply seen as paying lip service to the process. Apologies could be made but the bullying would continue in a more covert way, e.g. exclusion from group activities.

Unfortunately, there were schools at the other end of the spectrum where, apart from perfunctory statement about intolerance of bullying, very little enforcement of a strategy for dealing with such situations existed. Often these schools held the view that there was just so much that they could do because they couldn’t control what students did outside school or online.

“I don’t think the schools do anything about bullying, full stop. I think sometimes they try...I think they’re scared of what the consequences might be” (Max).

4.3 Advice to parents

When asked what advice they would give to parents, Steve felt “you can’t protect them completely...this may be kind of inevitable, it might be a kind of learning experience for them, they might develop resilience out of it ... You’ve got to build that resilience ... It’s about getting up...there are some big life lessons” (Max).

More specifically, respondents felt that it was very important to understand the online environment in which their children operated. Max noted one thus had to “try to understand what they’re doing ... how they do things and how they communicate”. Mark, too, emphasized “trying to stay connected with their lives”.

“I do realise that Brit’s not always in the right but it’s not for me to sort out her battles. She needs to fight her own battles and I don’t think I should be involving the other mother... They’re fickle with their friendships at this age...Today we might be friends, tomorrow we won’t, and for me to get involved, I wouldn’t have any friends left” (Diana).

With regard to social media activity, Michelle advised parents to “check your child’s social media with them. Anything they don’t feel comfortable with, to show the parents from an early age”. And in responding to messages that are hurtful, Hamish suggested “Let the ‘advice’ just bounce off because it’s bad advice. What they say says more about them than about you”.

Sue emphasized the relationship: “I went through a phase of monitoring everything and giving them certain times when they can be on social media but it was too Time-consuming with many children ... Have your child be open and try to be in the same room with them as much as possible so that you can kind of witness what’s going on on their social media because banning it is not the answer”.

Bronwyn also highlighted the importance of trust: “I follow her on Tiktok. I’m not on Snapchat and other media. I don’t fully follow her. I trust she doesn’t have parallel accounts ... I don’t feel like there’s something going on that she’s not telling me that I need to go and sneak on her phone. I’ve got the password but I don’t really think it’s appropriate to use.” Ultimately “it’s about fostering as much trust in the relationship and just highlighting that it’s not their fault” (Sue). And having learnt from her past overreaction, Bronwyn advised: “Listen before

you react to their story. If you are like me, the first thing you do is flip, shit on your child because you're so worried about this. Just listen to where they're coming from first before you respond".

Lastly, more strategically, Sue advised: "Encourage [the child] to join more clubs, different clubs that meant that they are part of different circles" so that if one implodes, there are still other groups of friends for the child.

5. Discussion

This research aimed to ascertain how parents responded to their children being cyberbullied – and whether there were differences between parents' perception of their responses and their children's perception of those responses.

In the sample of interviewees, all the children were of school-going age and, in the majority of instances, the bullying started online and then moved back and forth between that environment and the offline environment in school or various other offline venues like sports fields or social events (Notar et al., 2013). So, the bullying wasn't exclusive to the online environment although it provided the opportunity for more extreme communication in terms of nastiness of messages, greater disinhibition (Suler, 2004) and number of people to whom such messages were posted (Lowry et al., 2016).

Furthermore, often the online environment in which the child was active, e. g. certain gaming sites, dictated a certain sort of insulting (Notar et al., 2013), almost vicious behaviour which was seen as acceptable in that situation (Lowry et al., 2016), and not interpreted as bullying by the child. However, parents were far more sceptical about the apparent lack of inhibition (Suler, 2004).

Often the children didn't realise the full potential of the bullying, yet the parents' responses indicated that they knew full well how things might possibly develop and how dire the consequences might be (Martin-Criado et al., 2020). This is probably why many parents initially responded angrily to their children confiding in them that they were being bullied.

Perception of being bullied and response to the situation also depends very much on the individual. Some are very sensitive and yet others tend to ignore the attempted bullying. Boys tended to be more impervious to bullying attacks whereas girls tended to be very affected by such behaviour. In a number of instances, the children, particularly the girls, had changed schools to get away from the toxic environment (Turliuc et al., 2020).

In most instances, it was the mother in whom the child confided first about being bullied, or who noticed something amiss first - quite probably because she was the parent more involved in the child rearing and nurturing aspects of their lives (Hoff & Mitchell, 2009; Ho et al., 2020). However, in many cases, the mother was seen as being emotional and given to angry (and possibly embarrassing) responses so the father was told instead. By and large, fathers were seen as calmer and more rational.

Technical knowledge of the parents and their understanding of the online environment and more particularly, of the various social media (and even gaming) platforms was a major component in facilitating the extent to which the child felt understood and supported. The behavioural norms (Bandura, 1977) of the different environments needed to be understood as well as the extent to which posts could be hidden or manipulated.

The disclosure of being bullied depends very much on the relationship between the parent and the child (Ho et al., 2020; Wright, 2018). In many instances, the child felt that they had done something to provoke the bullying and they were embarrassed or ashamed to tell their parent. Often they felt guilty about their actions, and in many cases, they couldn't provide evidence of the bullying such as photo's posted on Snapchat. Furthermore, a number of children (and parents) felt they had to toughen up and deal with their own problems instead of running to their parents. However, being bullied can be very traumatic and the child needed to trust that their parent would love them, no matter what, when they confided in them. Unfortunately, in some instances, the parent had initially reacted very angrily towards the child, sometimes blaming them, and this had resulted in the child clamming up and feeling more isolated and sad. Unquestioning reassurance, sympathy and physical manifestations of love did a lot to make the child feel better about the situation and that they were not having to deal with it alone.

In terms of their parent's recourse to learning that their child was being bullied, the children generally felt reassured but a number were wary of the emotionally driven reactions of their parents (usually mothers) (Clark, 2011). Whether it was reporting the matter to the school, contacting the parents of the bullies or confronting the bully directly, children generally felt reluctant to proceed along those lines because the end result was lip service being paid to the process but the bullying continued more covertly (Hoff & Mitchell, 2009).

Ultimately, the main advice to parents was to build up a strong, trusting relationship with the child so that if/when they were cyberbullied, they had someone in whom they could confide and trust that they would be unconditionally supported. While the inevitability of having to cope with life's hard knocks was not dismissed, it was recognized how the harm could be diminished by understanding the online environment in which children nowadays operate and also by judicious engagement in their social media activities – not overly authoritarian but rather caringly consultative (Ho et al., 2020).

From a theoretical perspective, the background context was very much framed by social cognitive theory according to which the children learnt their online “bullying” behaviour from others and then continued it offline. Similarly, the victims might have learnt provocative behaviour from the online context. Parental mediation theory manifested itself strongly in terms of the extent to which parents involved themselves in their children's social media activity, often rationalising a relaxation of good intentions with the actual practical demands of daily living. However, self-discrepancy theory and, in particular, the notion of the negative true self manifested itself most strongly when parents had initial very angry outbursts at learning that their children were being bullied online but then stepped back, composed themselves and acted more rationally. Sometimes they didn't even recall their initial reaction – a desire to submerge the negative true self in favour of the ought self.

6. Conclusion

This research has broached a critical aspect of dealing with cyberbullying: the impact of the parent/child relationship. Considerable insights were gleaned as to how the relationship, when handled appropriately, can be used to minimize the harm of cyberbullying of children. Future research should explore the relative impacts of aspects of the relationship upon children of different personalities or age groups. From a more practical perspective, these findings can further inform school policies or parents of children.

References

- Bandura, A. (2002) “Social cognitive Theory in cultural context” *Applied Psychology*, Vol. 51, No. 2, pp269-290.
- Bandura, A. (1977) “Self-efficacy: Toward a unifying Theory of behavioral change” *Psychol Review*, pp. 191-215.
- Clark, S. L. (2011) “Parental mediation Theory” *Communication Theory*, Vol. 21, No. 4, pp. 323-343.
- Gillespie, A. A. (2006) “Cyber-bullying and harassment of teenagers: The legal response” *Journal of Social Welfare Family Law*, Vol. 28, No. 2, pp. 123-136.
- Goodyear, V. A., Armour, K. M. and Wood, H. (2018) “Young people and their engagement with health-related social media: New perspectives” *Sport Education Soc*, pp. 1-16.
- Ho, S., Lwin, M. O., Chen, L. and Chen, M. (2020) “Development and validation of a parental social media mediation scale across child and parent samples” *Internet Research*, Vol. 30, No. 2, pp. 677-694.
- Hoff, D. L. and Mitchell, S. N. (2009) “Cyberbullying: Causes, effects, and remedies” *Journal of Educational Administration*, Vol. 47, No. 5, pp. 652-665.
- Limber, S. P. (2012) *Cyberbullying: Bullying in the digital age*. Wiley-Blackwell, Malden, MA.
- Lowry, P. B., Zhang, J., Wang, C. and Siponen, M. (2016) “Why do adults engage in cyberbullying on social media? An integration of online disinhibition and deindividuation effects with the social structure and social learning model” *Information Systems Research*, Vol. 27, No. 4, pp. 962-986.
- Martin-Criado, J. M., Casas, J. A. and Ortega-Ruiz, R. (2021) “Parental supervision: Predictive variables of positive involvement in cyberbullying intervention” *International Journal of Environmental Research and Public Health*, Vol. 18, No. 1562, pp. 1-12.
- Notar, C. E., Padgett, S. and Roden, J. (2013) “Cyberbullying: A review of the literature” *Universal Journal of Educational Research*, Vol. 1, No. 1, pp. 1-9.
- Suler, J. (2004) “The online disinhibition effect” *Cyberpsychology Behavior*, Vol. 7, No. 3, pp. 321-326.
- Turliuc, M. N., Mairean, C. and Boca-Zamfir, M. (2020) “The relationship between cyberbullying and depressive symptoms in adolescence: The moderating role of emotion regulation strategies” *Computers in Human Behavior*, Vol. 109, pp. 106341.
- Wright, M. (2018) “Cyberbullying victimization through social networking sites and adjustment difficulties: The role of parental mediation” *Journal of the Association for Information Systems*, Vol. 19, No. 2, pp. 113-123.

Manifestations of the Groundswell in the Online Environment and its Impact on the Electric Cars Sales

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Abstract: Electric vehicles are popular in many countries, and they have become a symbol of eco-innovations and saving nature. Governments are getting innovative with their incentive policies to encourage clean vehicle sales without too much cost and without benefiting high-income households. On the other hand, the development of information technologies, the increased availability of the Internet and the sharp increase in online media users have caused a significant change in several areas of consumer behaviour. The paper examines the possible impact of the groundswell phenomenon in the purchase of electric cars in 21 countries and analyzes the groundswell manifestations in the online environment and the sales of electric cars in recent years. It also examines the impact of the COVID-19 pandemic, the war in Ukraine and high electricity prices on the sales of electric cars, as well as on the interest in these products expressed by searching for related terms on the Internet. The author identifies trends in this area and provides an overview of current research and studies mapping the influence of the groundswell on the saleability and communication of eco-products.

Keywords: Groundswell. Online Media. Electric Cars. Consumer Behaviour

1. Introduction

With the gradual improvement, expansion of the portfolio and subsidization of electric cars by governments, sales of electric cars are increasing every year. Since 2011, when approximately 55,000 electric cars were sold, annual sales of electric cars in Western Europe, the USA, China, Canada and Japan have increased by 1,300%. According to The Economist Intelligence Unit (2022), new-vehicle sales will stall in 2023, especially in Europe and the US. Global new-car sales will rise by just 0.9% globally, held back by squeezed consumer spending, high commodity prices and production shutdowns caused by supply-chain disruptions. New-car sales in western Europe will decline by about 3%, while they will fall by 2.4% in North America. Meanwhile, new CV sales will fall by 1.3% globally, amid an expected recession in the Eurozone and slower GDP growth in the US and China.

The development of information technologies, the increased availability of the Internet and the sharp increase in online media users have caused a significant change in several areas of consumer behaviour. Currently, online media are becoming more and more popular, and users also use them as a source of information. As Voramontri and Klieb (2018) point out, the social media revolution has led to new ways of searching and obtaining information about several products and services on the market. Powers et al. (2012) emphasize that this allowed consumers to connect and discuss brands quickly and easily.

According to the Digital Report (Kemp, 2022), there were 4.95 billion internet users and 4.62 billion active social media users. The number of internet users in 2022 increased by 4.0% and active social media users increased by 10.1% compared to the previous year. Daily time spent using the internet reached in 2022 almost 7 hours and using social media reached 2 hours and 27 minutes.

Online media has empowered consumers because marketers have no power over the content, timing, or frequency of online conversations between consumers. Many studies (e. g. Ashman, Solomon, and Wolny, 2015; Bronner & Hoog, 2010; Grant, Clarke, and Kyriazis, 2007) focus on consumer behaviour in an online shopping environment, but without considering the effects of the Internet on the various stages of the consumer decision-making process. Investigating the impact of the Internet and social media platforms on consumer behaviour is also justified in the context of the groundswell phenomenon. Li and Bernoff (2011) define the groundswell as a societal trend where people use technology to achieve what they need from each other rather than from traditional institutions such as businesses. Through the mentioned technologies, we understand precisely social networks, blogs, applications and other tools that allow obtaining the necessary information or sharing it. This is also confirmed by the data from the Digital Report (Kemp, 2022) on the use of the Internet and social media, according to which the primary reason why internet users aged 16 to 64 use the Internet is finding information (61.0%) and the sixth most common reason is finding new ideas or inspiration. In the case of social media, the sixth and the seventh most common reason to use it is finding inspiration for things to do and buy 27.7%) and finding products to purchase (26.3%).

According to Sarkar (2013), ecology and the economy are at a crossroads in the modern world. With the increasing pace of globalization and economic liberalization, giving birth to the rapid growth of consumerism by modern civilization, there is growing consciousness to move gradually towards green growth with sustainability.

In connection with the growing interest in eco-innovations, like electric cars and an ecological way of life, we can also assume an increased influence of the groundswell phenomenon precisely in the field of eco-products. For this reason, this paper examines the possible impact of the groundswell manifestations in the purchase of electric cars in 21 countries and analyses the groundswell manifestations in the online environment and the sales of electric cars in recent years. We are trying to find out if there is a connection between the interest in searching for the term "electric vehicle" on the Internet and the sale of battery electric vehicles (BEVs).

2. Aims and methodology

The paper aims to analyze the manifestations of the groundswell in the online environment and its possible impact on the sale of electric cars. The manifestations of the groundswell are analyzed with the help of search results on the Internet based on the so-called of interest in searching for selected keywords. The impact of the groundswell on the sale of electric cars was searched based on a comparison of data and sales of battery electric vehicles in 21 countries of the world and average values expressing the degree of interest in the search term "electric car" via the Internet search engine Google. The data was obtained using Google Trends and from the International Energy Agency. To prove the possible influence of these two variables, we used a correlation analysis, with the help of which we evaluated the dependence of two quantities (BEVs sales and interest in searching the term "electric car" on the Internet).

3. Assumptions

A1: There is a correlation between the interest in searching for the term "electric car" on the Internet and the sales of BEVs.

A2: Interest in searching for the term "electric car" on the Internet and the sales of BEVs have an increasing tendency between 2019 and 2021.

A3: Interest in searching for the term "electric car" will be highest in the countries with the highest sales of BEVs.

4. Discussion

According to the Global EV Policy (2022), in 2021, more than 4,700,000 battery electric vehicles (BEVs) were sold worldwide, which is more than double compared to 2020 (in 2020, more than 2,000,000 BEVs) and more than triple compared to 2019 (more than 1,500,000 BEVs were sold worldwide in 2019).

China has the largest share of BEVs sales, where more than 57% of global BEVs consumption was sold in 2020. We can observe an increase in BEVs sales in all analyzed countries except for the Netherlands. Figure 1 shows more detailed results.

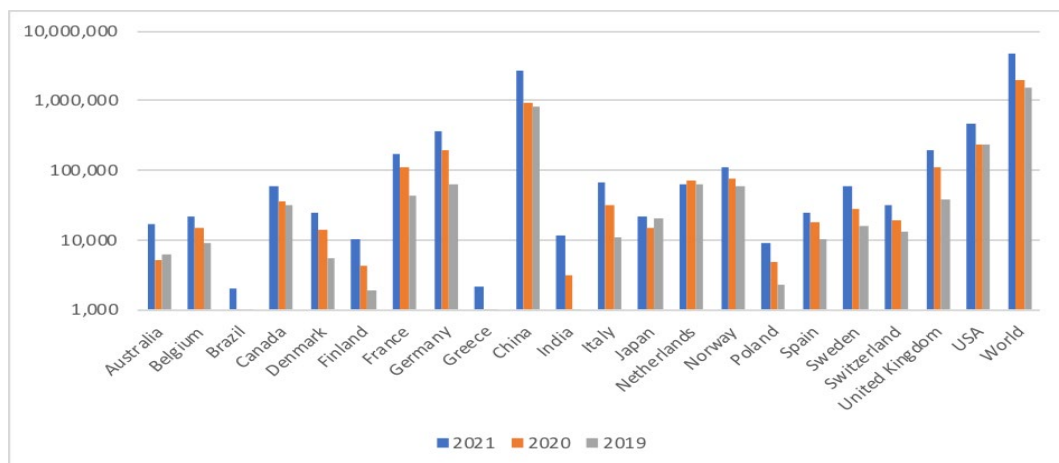


Figure 1 Comparison of BEVs sales in selected countries in 2019-2021.

Source: personal collection, 2022 (data: IEA®)

The sales of electric cars are influenced by several factors, from the price of the cars themselves, policies and support from the state to the economic level and situation in the given country. Marketing communication and varying degrees of sales support or direct discounts from manufacturers or sellers of electric cars have an impact on sales. However, based on the theory of the manifestations of the lower wave, we can assume that the behaviour of individuals in the Internet environment will reflect certain manifestations or indicate certain tendencies reflected in real shopping behaviour. We, therefore, focused on the analysis of search results for the term "electric car" in the Internet environment.

The results of the analysis show that in 2021 we can see the highest interest in searching for the term "electric car" in Norway, on the contrary, the lowest in Norway. When comparing individual years, we can see relatively significant differences in the level of interest of individual countries between 2019 and 2021, while the lowest interest can be observed in 2020. Figure 2 shows more detailed results.

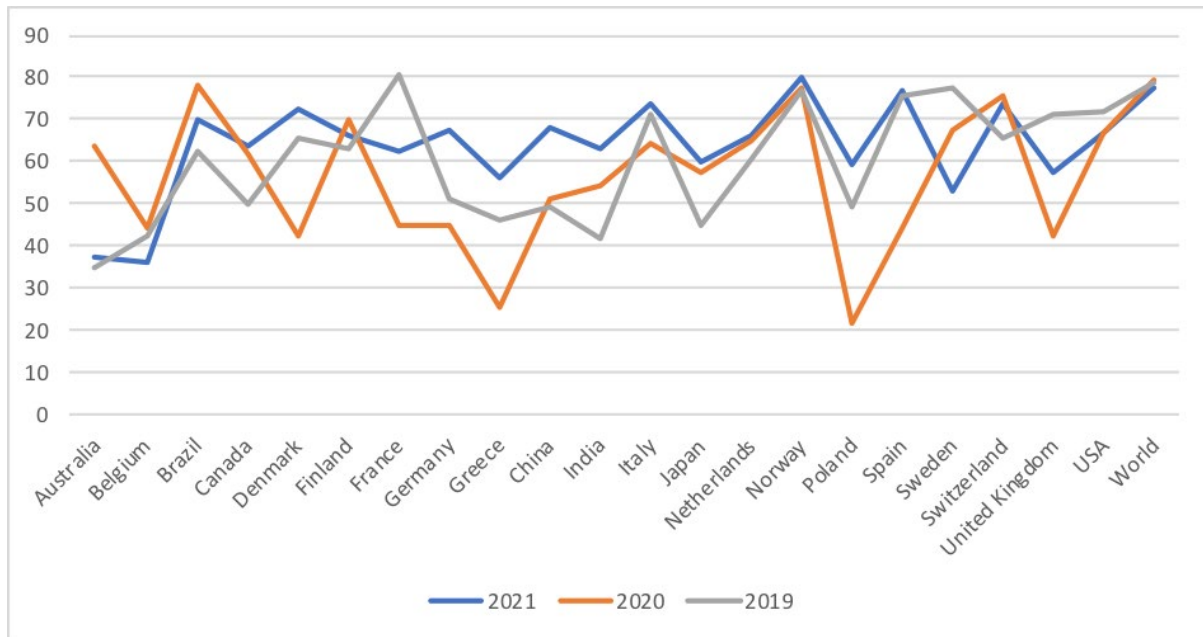


Figure 2 Comparison of the interest in searching for the term "electric car" in selected countries in 2019-2021.

Source: personal collection, 2022 (data: Google Trends©)

An interesting finding is that the average value expressing interest in searching for this term in China ranks seventh among all analyzed countries, while sales in this country reached the highest value in 2021. We, therefore, investigated the possible impact of interest in searching for the term "electric car" on BEVs sales through a correlation analysis for the years 2019-2021. Tables 1-3 show the results of the correlation matrix.

Table 1 Correlation matrix (BEVs sales and interest in searching for the term "electric car" in 2019)

	Google Trends	BEVs Sales
Google Trends	1	
BEVs Sales	0.214029394	1

Source: personal collection, 2022

Table 2 Correlation matrix (BEVs sales and interest in searching for the term "electric car" in 2020)

	Google Trends	BEVs Sales
Google Trends	1	
BEVs Sales	0.260407894	1

Source: personal collection, 2022

Table 3 Correlation matrix (BEVs sales and interest in searching for the term "electric car" in 2021)

	Google Trends	BEVs Sales
Google Trends	1	
BEVs Sales	0.291586741	1

Source: personal collection, 2022

The results of the correlation analysis revealed a weak positive correlation in all three analyzed years, while we can observe a slight increase in 2021 compared to the previous two years. We can thus conclude that there is very little connection between the interest in searching the term "electric car" on the Internet and the sale of BEVs. We can partially confirm assumption 1.

The level of interest in searching for the term "electric vehicle" on the Internet was not the same in individual years. The level of interest also differed in individual countries. However, the results of the analysis showed that the interest in searching for the term "electric car" between 2019 and 2021 did not have a growing tendency. In 2020, we can observe a more significant decrease compared to 2019. Therefore, we cannot confirm assumption 2.

Search interest for the term "electric vehicle" in 2019-2021 was highest in countries where BEVs sales were significantly lower than in countries with the highest sales. Therefore, we cannot confirm assumption 3. Figure 3 shows more detailed results.

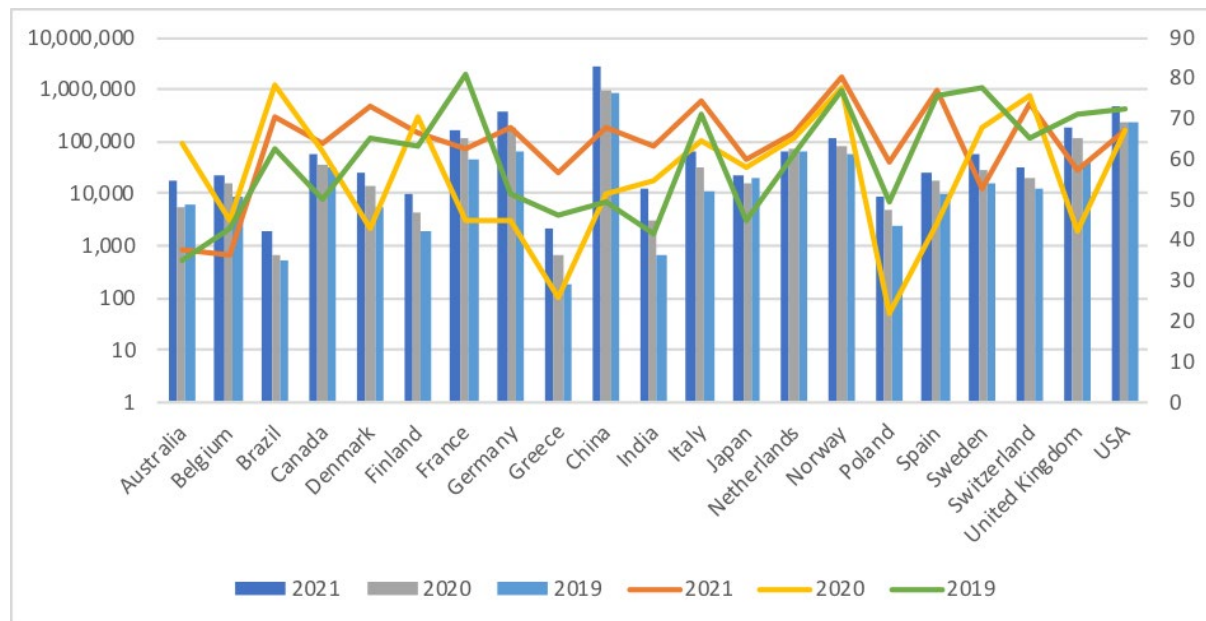


Figure 3 Comparison of the interest in searching for the term "electric car" and the number of BEVs sold in selected countries in 2019-2021.

Source: personal collection, 2022 (data: Google Trends®, IEA®)

5. Conclusion

Using various unofficial sources, such as social or online media, instead of official sources, such as official websites, stores, etc. to obtain the required information, the professional literature describes it as a groundswell phenomenon. Several studies (e.g. Peiró-Signes, A., Segarra-Oña, M., 2018; Li, 2010; Jansson, 2011) point to a change in the consumer and media behaviour of not only current but also older generations, while we can observe manifestations of the mentioned lower wave. This is also confirmed by data on the use of social networks or data from Internet searches (Kemp, 2022). As Krajčovič (2022) points out, given the importance of innovations and ecological solutions, social media and social networks can even be considered necessary, especially in raising awareness and eco-products, ecological services, as well as other ecological options available to customers.

From the point of view of researching the influence of the groundswell on consumer behaviour, it is interesting to analyze data from the online environment that talks about the way of using social or online media, and data about the consumption or sales of specific products. These data, in turn, indicate a certain trend in consumer behaviour.

For this reason, we investigated the possible connection between Internet searches and sales of electric cars. We analyzed the search for the keyword "electric car" through the Internet search engine Google, expressed by the so-called search interest and the number of BEVs sold in 21 countries around the world. We hypothesized that due to the phenomenon of the groundswell mentioned above and described in the literature, there would be a mutual connection between Internet searches and BEVs sales, which would confirm the existence of the groundswell and its direct impact on consumer behavior.

The results of the analysis confirmed the mutual connection and positive correlation between these variables, but it should be emphasized that this is a weak correlation. The results thus confirm the existence of the groundswell but do not prove its significant influence on the investigated phenomenon. However, the reason may be the fact that consumer behaviour, especially in the case of electric cars, is influenced by several factors that were not included in this analysis.

However, an interesting finding is that interest in searching for the term "electric car" on the Internet between 2019 and 2021 did not have an increasing tendency. In 2020, we can observe a significant decrease in interest in searching for this term, especially in some countries, such as Denmark, Greece or Poland. One of the reasons may be the COVID-19 pandemic, which affected almost all industries and affected the sales of many products.

Another interesting finding is that in the countries where the largest number of BEVs were sold, there was also the highest interest in searching for the term "electric car" on the Internet. We found much higher interest in countries where BEVs sales were lower. We found the highest search interest in France in 2019, on the contrary, we found the lowest interest in Poland in 2020.

According to Jansson (2009), in terms of the above-mentioned factors that influence consumer behaviour when buying electric cars, the following can be classified: (1) high-involvement green purchase decisions, such as eco-innovation adoption, can be viewed as morally based; (2) green purchase decisions and curtailment behaviours within a specific context are determined by partly different factors but the personal norm is a strong predictor of both types of behaviours; (3) green consumers are a heterogeneous group that can be separated based on green curtailment behaviours and proenvironmental purchase decisions, and (4) personal and social norms, consumer novelty seeking, and four perceived innovation characteristics influence the adoption decision.

The willingness to accept ecological innovations is also influenced by other determinants, which are the result of a combination of attitudinal factors and habits. According to Jansson et al. (2010) values, beliefs, norms, and habit strength determine the willingness to curtail and the willingness for eco-innovation adoption. Personal norms have a strong positive influence on willingness for the behaviours and habit strength has a negative influence. The other determinants have varying influences depending on the type of behaviour.

Social media can provide us with a lot of interesting information and data that can point to a certain trend, either in consumer or purchasing behaviour. By comparing these data over time, we can observe development tendencies and determine their probable development.

6. Limitations and scope for future research

The contributions focused exclusively on the number of BEVs sold (while we did not analyze other categories of electric cars such as Plug-in Hybrid Vehicles - PHEVs or Hybrid Electric Vehicles - HEVs) and interest in searching for the term "electric car" on the Internet. We did not analyze specific conditions, restrictions and other factories in individual countries that affect the sale of electric cars (such as government incentives, etc.). Data on the number of BEVs sold were compared with data on interest in searching for a specific term on the Internet. We compared the interest in the Internet term "electric car", while they did not try and compare the interest in searching for other related terms. The paper aimed to find out whether there is a possible connection between the search for and the sale of electric cars. Further studies from a more detailed possible connection using a wider range of search keywords.

Acknowledgement

The research was supported by the Scientific Grant Agency of the Ministry of Education, Science, Research and Sport of the Slovak Republic and the Slovak Academy of Sciences (VEGA, No. 1/0458/21) under the project entitled "Management of the "groundswell" concept by business entities in promotion of environmentally-friendly products in times of technology interference".

References

- Ashman, R., Solomon, M.R. and Wolny, J. (2015) "An old model for a new age: consumer decision-making in participatory digital culture", *Journal of Customer Behaviour*, Vol. 14, No. 2, pp 127–146.
- Bronner, F. and Hoog, R. (2010) "Consumer-generated versus marketer-generated websites in consumer decision making", *International Journal of Market Research*, Vol. 52, No. 2, pp 231–248.
- Global EV Policy (2022) International Energy Agency, [online], <https://www.iea.org/data-and-statistics/data-tools/global-ev-data-explorer>.
- Grant, R., Clarke, R.J. and Kyriazis, E. (2007) "A review of factors affecting online consumer search behaviour from an information value perspective", *Journal of Marketing Management*, Vol. 23, No. 5-6, pp 519–533.
- Jansson, J. (2009) "Car(ing) for our environment?: Consumer eco-innovation adoption and curtailment behaviours: The case of the alternative fuel vehicle", [Doctoral thesis]. Umeå: Umeå School of Business, Umeå University, 123 p.
- Jansson, J. (2011) "Consumer eco-innovation adoption: assessing attitudinal factors and perceived product characteristics", *Business Strategy and the Environment*, Vol. 20, No. 3, pp 192-210.
- Jansson, J., Marell, A. and Nordlund, A. (2010) "Green consumer behaviour: determinants of curtailment and eco-innovation adoption", *Journal of Consumer Marketing*, Vol. 27 No. 4, pp 358-370.
- Kemp, S. (2022) Digital Report, [online], <https://datareportal.com/reports/digital-2022-global-overview-report>.
- Li, C. (2010) "Groundswell. Winning in a World Transformed by Social Technologies", *Strategic Direction*, Vol. 26, No. 8, [online], <https://doi.org/10.1108/sd.2010.05626hae.002>.
- Krajčovič, P. (2022) "Možnosti využitia dát zo sociálnych sietí pri manažmente spodnej vlny v rámci marketingovej komunikácie ekoinovácií", *Sociální dilema 2021. Nové přístupy k managementu znalostí a ochraně na internetu : recenzovaný sborník příspěvků interdisciplinární mezinárodní vědecké konference konané dne 5. 11. 2021 v Brně*. Právni institut, pp 278-284.
- Li, Ch. and Bernoff, J. (2011) *Groundswell: winning in a world transformed by social technologies*. Harvard Business Press.
- Peiró-Signes, A., Segarra-Oña, M. (2018) "How past decisions affect future behaviour on eco-innovation: An empirical study", *Business Strategy and the Environment*, Vol. 27, No. 8, pp 1233-1244
- Powers, T., Advincula, D., Austin, M.S., Graiko, S. and Snyder, J. (2012) "Digital and social media in the purchase decision process", *Journal of Advertising Research*, Vol. 52, No. 4, pp 479–489.
- Sarkar, A. N. (2013) "Promoting Eco-innovations to Leverage Sustainable Development of Eco-industry and Green Growth", *European Journal of Sustainable Development*, Vol. 2, No. 1, pp 171-224.
- The Economist Intelligence Unit (2022) *Automotive outlook 2023*, [online], <https://www.eiu.com/n/campaigns/automotive-in-2023/>.
- Voramontri, D. and Klieb, L. (2018) "Impact of Social Media on Consumer Behaviour", *International Journal of Information and Decision Sciences*, Vol. 11, No. 3, pp 209-233.

Predicting Food Safety Violations via Social Media to Improve Public Health Surveillance

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Abstract: Foodborne illness outbreaks originating in food service establishments (FSEs) are a serious public health concern. There are multiple ways that FSEs can contribute to the propagation of foodborne illnesses. However, not all these risks can be detected by health authorities during official inspections for two reasons. First, health authorities have limited resources, meaning not every FSE can be inspected as often and expediently as necessary. Second, because the food safety and hygiene standards of FSEs are dynamic, the inspection results might represent a snapshot that fails to resemble the current FSE situation. Consequently, it would be helpful to have an early warning system that can allow health authorities to predict the risk levels of FSEs and proactively intervene by demanding that high-risk FSEs take appropriate countermeasures. Considering that customers who feel sick after visiting an FSE may not report their experience to health authorities but instead disclose this information by posting online reviews on social media platforms, this study leverages social media data to predict food safety violations by FSEs. The empirical data for this study derive from two sources: the FSE inspection results from the Department of Health and Mental Hygiene in New York City, which labeled each FSE according to whether it violated food safety regulations, and textual reviews posted by FSE customers on Yelp. Machine learning algorithms were employed to extract textual features from the reviews and construct predictive models. Our results demonstrate that customer reviews posted on social media platforms are valuable for predicting FSE food safety violations. Health authorities can leverage social media data to construct predictive models and deploy them to optimize resource allocation and prioritize interventions to prevent foodborne illness outbreaks originating in FSEs, improving public health. FSE managers can also deploy the models to improve their hygiene standards in response to alerts raised. By taking appropriate countermeasures earlier, they can reduce their risk of financial loss due to negative inspection results.

Keywords: Public Health Policy, Foodborne Illness, Social Media, Customer Reviews, Predictive Modeling

1. Introduction

Although eating in food service establishments (FSEs) is an essential part of the lifestyle of many individuals, it is also a risk factor for foodborne illnesses (Choi et al., 2019; Green & Selman, 2005). To prevent FSE visitors contracting a foodborne illness, the food safety and hygiene standards of FSEs should be closely monitored. In many countries, health authorities conduct regular inspections of FSEs to investigate various aspects of their conduct, including kitchen cleanliness and food handling. If FSEs fail to comply with food safety regulations, they can be fined or forced to close immediately. Nonetheless, the effectiveness of the inspections and surveillance conducted by health authorities remains uncertain, with foodborne illness outbreaks often originating in FSEs. For instance, a foodborne illness outbreak originating at a catering organization in Singapore in 2018 affected more than 60 people, 45 of whom were hospitalized and 1 of whom died (Food Safety News, 2020). If FSEs that fail to comply with food safety regulations are identified and forced to take appropriate countermeasures earlier, foodborne illness outbreaks can be prevented, saving lives. Unfortunately, because health authorities have limited resources, FSEs are not inspected as often and expediently as necessary (Kang et al., 2013; Siering, 2021).

This study aims to develop predictive models that can identify FSEs with a high probability of violating food safety regulations. Previous studies have shown that social media data, such as online reviews, are a good source of information for public health surveillance (Harrison et al., 2014; Schomberg et al., 2016). This study leverages online reviews of FSEs posted on social media platforms (namely, Yelp), extracting textual cues that predict FSE inspection outcomes. The predictive models developed can be deployed as an early warning system that supports public health policy by enabling health authorities to prioritize their resources in favor of investigating high-risk FSEs. This approach not only prioritizes interventions but also prevents the public from suffering negative health consequences.

This paper is structured as follows. Section 2 summarizes the relevant literature. Section 3 introduces the study methodology. Section 4 presents the results. Section 5 discusses the results and concludes the study.

2. Literature Review

Foodborne illnesses are a serious public health concern that can be prevented by inspection and surveillance conducted by health authorities. However, although FSEs can contribute to the propagation of foodborne

illnesses in various ways, not all these risks can be detected by health authorities in a timely manner (Schomberg et al., 2016). Furthermore, the hygiene of FSEs can be very dynamic, changing over time. Consequently, the inspection results obtained during each inspection cycle might represent a snapshot that fails to represent the current hygiene standards of FSEs (Siering, 2021). This highlights the need for an early warning system that can allow health authorities to predict the risk levels of individual FSEs and proactively intervene by demanding that high-risk FSEs take appropriate countermeasures.

Researchers have recently started using social media platforms to conduct various types of public health investigations. Harrison et al. (2014) used online reviews to identify unreported foodborne illness cases. They discovered that a series of reviews described an incident consistent with the development of foodborne illness that was not reported to health authorities. Their results confirmed that there was publicly reported information about foodborne illness available on social media platforms. Therefore, health authorities can perform social media analytics for disease detection, identifying unreported outbreaks of foodborne illness and FSEs with deficient food handling protocols (i.e., FSEs that are more likely to violate food safety regulations). According to Siering and Janze (2019), severely negative health inspection results of FSEs impacted consumer perceptions of FSE service quality, leading to changes in their online review star ratings. This shows that, to a certain extent, online FSE reviews posted on social media platforms reflect the outcome of food safety inspections. This suggests that review features, such as star ratings, might be valuable for predicting FSE inspection results. Nonetheless, solely using star ratings is insufficient because that approach oversimplifies quality measures by assuming them to be unidimensional (Archak et al., 2011). In contrast, textual comments contain personal narratives of experiences with a specific service (von Helversen et al., 2018), providing an alternative that offers a more fine-grained understanding of the customer experience, better helping to predict FSE hygiene levels. Specific terminology appears in textual reviews that see customers focus on hygiene aspects. Siering (2021) selected particular words (e.g., “sick,” “dirt,” and “poisoning”) as features to represent online reviews and used them to predict FSE health violations. The results showed that classifiers that consider these textual features are valuable for detecting future health violations.

In addition, an academic consensus suggests that service quality affects customer satisfaction. In general, if customers experience an illness after visiting an FSE, their satisfaction will be lessened. Previous studies have used customer sentiments detected from textual reviews as a proxy for customer satisfaction (Lee, 2022; Wang et al., 2020). Siering (2021) used the sentiment polarity of reviews to predict the health violations of FSEs, demonstrating that sentiment polarity represents a useful predictor. Nonetheless, the sentiment polarity of the reviews only indicates whether the review is associated more with positive, negative, or neutral feelings. Emotions such as joy, fear, and anger were excluded from the study. In contrast, Peng et al. (2017) discovered that FSE stimuli, such as food quality, influenced FSE visitors’ emotions, including joy, excitement, peacefulness, anger, distress, and disgust. Given the relationship between FSE food handling performance and customer emotions, it is worth inquiring about the predictive power of customer emotions, in addition to sentiment polarity, for detecting FSE food safety regulations.

To summarize, this study leverages social media data by extracting a set of features from online reviews for prediction. Specifically, we aim to use (i) hygiene-related words, (ii) FSE visitor sentiments, and (iii) FSE visitor emotions detected from social media reviews to predict FSE food safety violations.

3. Methodology

The research methodology, as Figure 1 shows, comprised three phases: Data Collection, Feature Extraction, and Model Construction and Evaluation. The first phase involved collecting historical FSE inspection results and extracting FSE customer reviews from the social media platform Yelp. Based on the FSE name and the address, each customer review was matched with the corresponding FSE. The second phase involved aggregating reviews at the FSE level. For each FSE, the total count of hygiene-related words appearing in the reviews was computed, followed by the detection of the sentiments and emotions contained in the reviews. The outputs were used as the textual features for the proposed predictive models, with the average rating given by the customers of each FSE computed and used to construct baseline models. Using the performance of these baseline models, we could determine whether models leveraging textual data can give better prediction results. This study used k-fold cross-validation to construct and evaluate models. Details of each phase appear in the following sections.

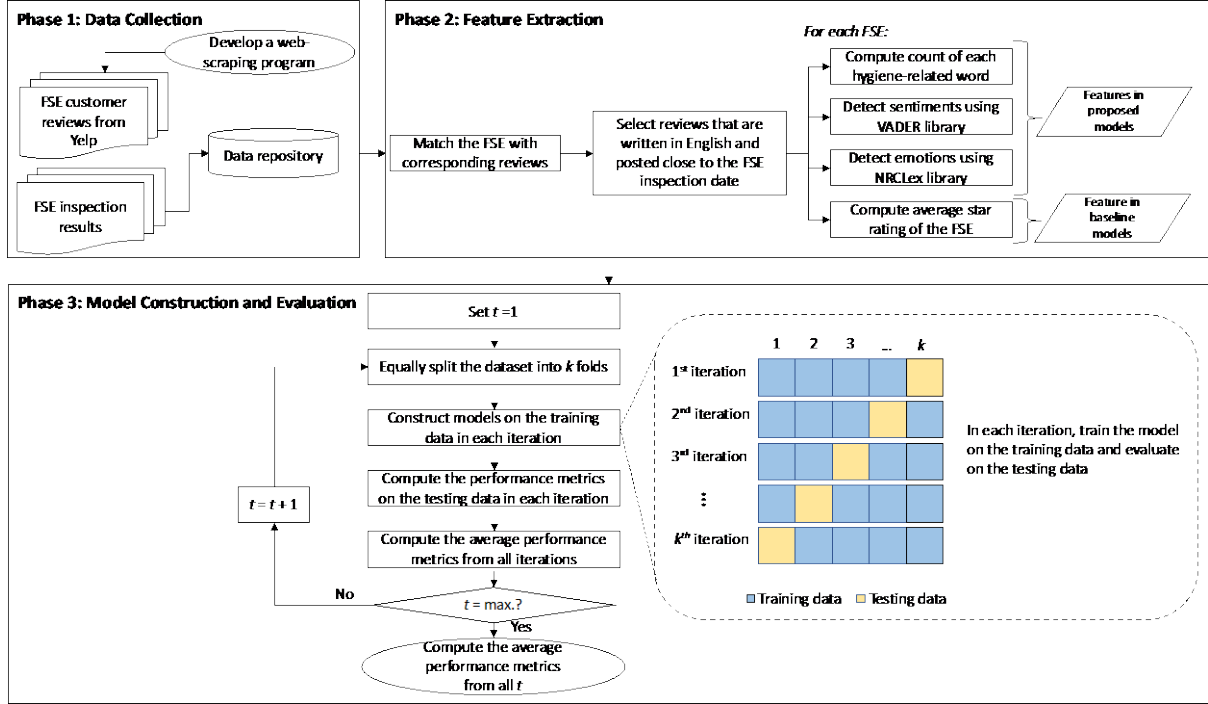


Figure 1: Study Methodology

3.1 Data Collection

The empirical data used for this study were open-source data from two sources. The first data source was the restaurant inspection results from the Department of Health and Mental Hygiene (DOHMH) in New York City. New York City Open Data allows access to such data via API. The dataset contains FSE inspection results for up to three years prior to the most recent inspection. For each FSE, there are fields for FSE name, inspection date, violation description, zip code, cuisine description, and critical flag. The critical flag indicates whether an FSE severely violated regulations. We used this as the target variable of the predictive models, that is, to observe whether it can classify whether an FSE is likely to severely violate regulations (i.e., critical flag = “Critical”) or not (i.e., critical flag = “Not Critical”). This study only considered FSEs that had been inspected by the DOHMH, as indicated in the dataset (because only these FSEs have inspection results). Some FSEs might have been inspected more than once. In those cases, only the latest inspection was considered. The second data source was FSE reviews on Yelp. A web-scraping program was developed to extract reviews posted on Yelp. Each review contained fields for FSE name, reviewer name, review date, textual review, and star rating.

3.2 Feature Extraction

After data collection, data preparation was performed to extract features from the textual reviews. Based on the FSE name and the address, we matched the FSE with the corresponding Yelp reviews. Two selection criteria enabled review selection. First, we selected reviews posted a maximum of 90 days before the inspection date to ensure that the reviews reflected the situation of the FSEs at the time of inspection. Second, we selected reviews written in English. For each FSE, we aggregated all the reviews and counted the frequency with which the following hygiene-related words appeared: sick, dirty, poisoning, sticky, disgusting, filthy, ill, diarrhea, nausea, cramp, stomachache, vomit, rancid, and fever. Then, we conducted sentiment analysis. The VADER library on Python was chosen because it is sensitive to sentiment expression in social media contexts (Hutto & Gilbert, 2014). For a body of text, VADER generates ratios indicating the proportions of the text that falls into the three categories positive, neutral, and negative, as well as including a compound value (a commonly used measure of sentiment polarity). These three ratios and the compound value were used as the features of customer sentiments. Because VADER works best on short documents rather than large documents, we split each review into individual sentences to apply VADER at the sentence level. For each review, sentiment scores (positive, neutral, negative, compound) were the mean of the sentiment scores of all sentences, following the method of Stratigi et al. (2019). The overall sentiment scores associated with an FSE are the mean of the sentiment scores of all its reviews. Finally, we used the NRClex library on Python to measure the emotional

affect contained in the reviews, detecting eight emotions: fear, anger, anticipation, trust, surprise, sadness, disgust, and joy. Based on the words in a review, it generates a score for each emotion. For each FSE, the emotion score is the average of all its reviews. Table 1 summarizes the features extracted from the textual reviews.

Table 1: Textual features used for predictions

Feature category	Features used	Description
Hygiene-related words	TF_p	Total word count of each hygiene-related word p in all reviews of an FSE
Sentiment	Avg_compound	The average compound value (sentiment polarity) of all reviews of an FSE
	Avg_pos	The average proportion of text appearing in all reviews of an FSE that is positive
	Avg_neg	The average proportion of text appearing in all reviews of an FSE that is negative
	Avg_neu	The average proportion of text appearing in all reviews of an FSE that is neutral
Emotion	Avg_fear	The average fear-related affect in all reviews of an FSE
	Avg_anger	The average anger-related affect in all reviews of an FSE
	Avg_anticip	The average anticipation-related affect in all reviews of an FSE
	Avg_trust	The average trust-related affect in all reviews of an FSE
	Avg_surprise	The average surprise-related affect in all reviews of an FSE
	Avg_sadness	The average sadness-related affect in all reviews of an FSE
	Avg_disgust	The average disgust-related affect in all reviews of an FSE
	Avg_joy	The average joy-related affect in all reviews of an FSE

3.3 Model Construction and Evaluation

To avoid issues with bias, three different machine learning algorithms were employed to predict whether an FSE was violating food safety regulations: decision tree, random forest, and support vector machine. To avoid overfitting, k -fold cross-validation was used to enable training and testing to be performed on different parts of the dataset. The cross-validation was repeated t times to remove any resampling bias (Van Nguyen et al., 2020). The overall performance of each model is based on the average of the metrics of the testing sets from all iterations. This study uses four performance metrics:

$$Accuracy = \frac{TP + TN}{TP + TN + FP + FN} \quad (1)$$

$$Precision = \frac{TP}{TP + FP} \quad (2)$$

$$Recall = \frac{TP}{TP + FN} \quad (3)$$

$$F1\ score = 2 \times \frac{Precision \times Recall}{Precision + Recall} \quad (4)$$

where TP , TN , FP , and FN represent true positive, true negative, false positive, and false negative, respectively. In this study, the positive case represents an FSE that violates food safety regulations, and the negative case represents an FSE that does not violate food safety regulations. Accuracy is defined as the total number of correct predictions divided by the total number of predictions. Precision concerns the number of correct positive predictions. It shows, of those predicted to be positive, how many are actual positive cases. Recall concerns the

number of correctly predicted positive cases and provides insight into how many actual positives are predicted as positive. The F1 score is considered the harmonic mean of precision and recall.

4. Results

After randomly extracting 180 New York City FSEs inspected by the DOHMH in 2021, we excluded FSEs with an undefined inspection outcome (i.e., critical flag = “not applicable”), leaving 178 FSEs. The inspections were conducted in the period between May 13, 2021, and December 27, 2021, and saw 52.2% of the FSEs severely violate regulations. Next, we checked whether the FSEs had a valid Yelp review page. FSEs not associated with any Yelp review were omitted. In our sample, all FSEs had associated Yelp reviews, so none were omitted. A total of 1,789 Yelp reviews were extracted.

To extract features from the textual reviews, we first computed the frequency of hygiene-related words. Figure 2 shows the frequency with which the chosen hygiene-related words appeared in the reviews. The most popular word is “sticky,” followed by “disgusting” and “dirty,” with 15.7% of the FSEs receiving a review containing at least one hygiene-related word. Among these FSEs, 64.3% had severely violated regulations.

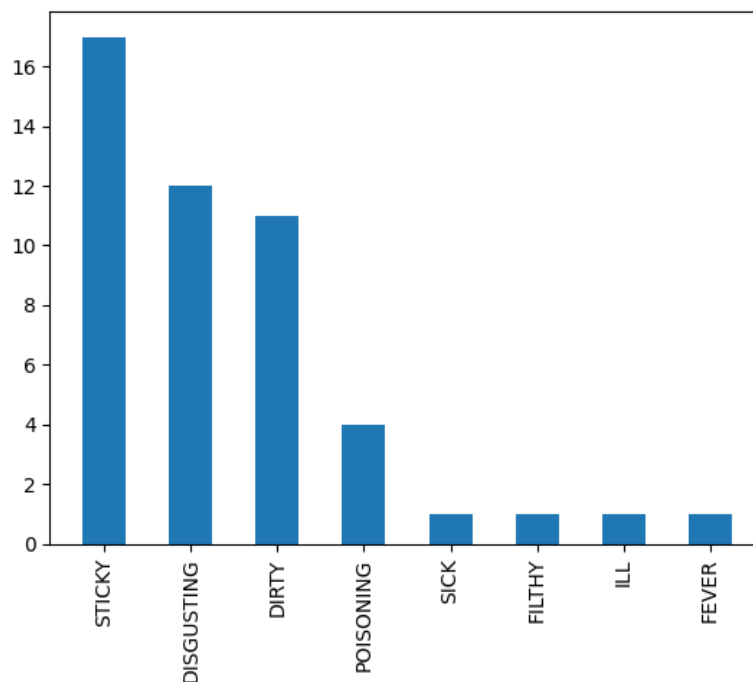


Figure 2: Frequency of hygiene-related words in the reviews

Using the VADER library, the sentiment of each review was detected. To verify the reliability of our sentiment analysis, we compared the compound values to the star ratings of the reviews. In Yelp, each review includes a 1–5 star rating. Higher scores imply greater customer satisfaction and, in turn, greater sentiment polarity. Figure 3 shows that reviews with higher ratings have higher compound values, and reviews with lower ratings have lower compound values, confirming the reliability of the sentiment analysis.

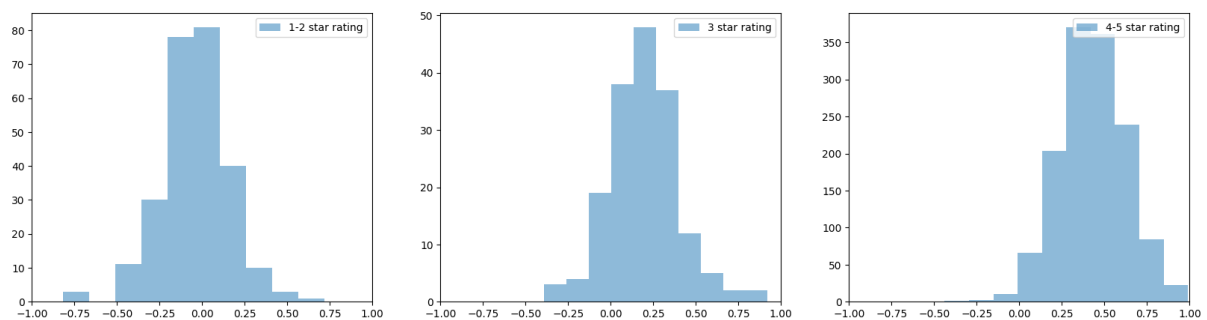


Figure 3: Sentiment polarity and overall rating of the reviews

After extracting the textual features, predictive models were constructed. To compare the performance of multiple models, we ran all models with stratified 3-fold cross-validation (i.e., $k=3$) and repeated the stratified 3-fold cross-validation a further three times (i.e., $t=3$). Table 2 summarizes the results.

Table 2. Prediction results based on the three-fold, three-time repeated stratified cross-validation

Algorithm	Model	Accuracy	Precision	Recall	F1 score
Decision tree	Baseline	47.2	49.4	41.9	45.3
	Proposed model	51.1	53.1	54.8	54.0
Random Forest	Baseline	48.1	50.4	47.7	49.0
	Proposed model	45.0	47.6	52.3	49.8
Support vector machine	Baseline	43.8	47.6	75.3	58.3
	Proposed model	52.8	53.0	86.0	65.6

Most of our proposed models leveraging online reviews from Yelp performed better than the baseline models in terms of accuracy, precision, recall, and F1 score, with the exception of the accuracy and precision of the random forest models, which were slightly lower than those of the baseline model.

Precision is a useful measure when a high cost is associated with *FP*. In our research context, *FP* indicates that an FSE that is not violating regulations is predicted to be violating regulations. In contrast, recall is useful when the cost of *FN* is high. *FN* indicates that an FSE that is violating regulations is predicted to be not violating regulations. If we deploy our model when recall is low, the consequences for the public are negative because customers may visit an unsafe FSE that the model determines to be safe. Therefore, from the perspective of public safety, recall is an important model evaluation metric. Lastly, the F1 score is a function of precision and recall that can be used to summarize the evaluation of a model using a single number.

Because this study aims to support public health policy by enabling health authorities to identify FSEs that are likely to be at risk of violating regulations and to prevent the public from contracting foodborne illnesses, the cost of *FN* is very high, meaning that recall is of considerable importance. We primarily evaluated model performance based on recall. The best-performing algorithm is support vector machines, which demonstrated recall of 86%, meaning that 86% of the FSEs with violations were predicted correctly. Deploying our model with a high recall can help health authorities identify FSEs that are likely to be at risk of violating regulations (i.e., predicted positive cases). Because health authorities may not have sufficient resources to inspect every FSE, they can use our model as an early warning system, allowing them to detect high-risk FSEs and plan inspections. This is valuable not only for optimizing resource allocation but also for preventing outbreaks of foodborne illnesses by forcing FSEs that violate food safety violations to close or adopt countermeasures to improve food safety. Our results illustrate that social media data (leveraged by the appropriate machine learning algorithms) can support public policy, substantially improving public health.

5. Discussion and Conclusion

This study leverages social media data to identify FSEs that are more likely to be at risk of violating food safety regulations. Our findings show that textual comments posted by FSE visitors on social media platforms are valuable for predicting violations. However, although we recognize the value of using social media data in the context of public health surveillance, we do not imply that actual inspections should be fully substituted with social media analytics. Instead, we argue that social media data, when appropriately analyzed, can complement current inspection policy by enabling health authorities to make more informed decisions when allocating resources and prioritizing interventions.

These findings have important implications for health authorities and FSE managers. First, health authorities can deploy our models to prioritize high-risk FSEs when scheduling official inspections. Although extracting textual cues from social media for analytics might be an expensive investment, the costs are justified by the benefits, which include reducing search costs and protecting the public against foodborne illnesses.

Our results also suggest that customers can act as hygiene inspectors who disclose inspection results on social media. This can provide FSE managers with access to almost-real-time feedback on food safety, precluding the need to passively await official inspection results from health authorities. If customers report food safety risks

on social media, FSE managers can review their food handling practices without delay. In this context, following up on customer reviews and taking appropriate countermeasures prior to official inspections is vital, not only for improving public health but also for minimizing the risk of financial losses due to a negative inspection outcome.

This study combines machine learning and public policy, responding to the call from Leist et al. (2021) for more research effort into applying machine learning to social and health research questions. We have presented a sophisticated research framework that city authorities can apply to support public policy, and we have confirmed how social media analytics can be used as a diagnostic tool to enhance FSE food safety, incorporating customer feedback into the FSE inspection process. Although this study concerns FSE inspection schemes, the results can be reasonably generalized to authorities in other fields that have access to large volumes of social media data. This represents a paradigm shift, with customer feedback available on social media platforms now having the potential to produce more thorough evaluations of policy effectiveness.

Nonetheless, this study has certain limitations, opening future research avenues. First, this study focused on FSEs from New York City, with evidence affirming the generalizability of the findings limited. Future research that includes FSEs from other cities and countries could resolve the generalizability issue. Second, although this study has shown that keywords related to hygiene aspects of FSEs in textual reviews can usefully predict the inspection results of FSEs, other aspects of FSEs, such as service and atmosphere, might relate to the outcome of inspections. Future research could use different text-mining approaches, such as topic modeling, to extract different service aspects of FSEs from social media data and use these as features in the application of our methodology for the purpose of comparing results. Third, this study did not consider the influence of the operating environment: FSEs operating in less competitive environments might pay less attention to food quality, putting them at a higher risk of violating food safety regulations. Future research could investigate how the performance of our models differs when the FSEs face different levels of competition in their operating environment.

Acknowledgements

This project is funded by Internal Seed Funding from Singapore University of Social Sciences (Project Code: RF00015).

References

- Archak, N., Ghose, A. and Ipeirotis, P. G. (2011) "Deriving the pricing power of product features by mining consumer reviews", *Management Science*, Vol 57, No. 8, pp. 1485-1509.
- Choi, J., Nelson, D. and Almanza, B. (2019) "Food safety risk for restaurant management: use of restaurant health inspection report to predict consumers' behavioral intention", *Journal of Risk Research*, Vol 22, No. 11, pp. 1443-1457.
- Food Safety News (2020) "Caterer in Singapore fined for 2018 food poisoning outbreak", [online], <https://www.foodsafetynews.com/2020/12/caterer-in-singapore-fined-for-2018-food-poisoning-outbreak/>
- Green, L. R. and Selman, C. (2005) "Factors impacting food workers' and managers' safe food preparation practices: A qualitative study", *Food Protection Trends*, Vol 25, No. 12, pp. 981-990.
- Harrison, C., Jorder, M., Stern, H., Stavinsky, F., Reddy, V., Hanson, H., Waechter, H., Lowe, L., Gravano, L. and Balter, S. (2014) "Using online reviews by restaurant patrons to identify unreported cases of foodborne illness—New York City, 2012–2013", *MMWR*, Vol 63, No. 20, pp. 441–445.
- Hutto, C. J. and Gilbert, E. (2014) "VADER: A parsimonious rule-based model for sentiment analysis of social media text", in *Proceedings of the Eighth International AAAI Conference on Weblogs and Social Media (ICWSM-14)*, Ann Arbor, MI, USA, pp. 216–225.
- Kang, J. S., Kuznetsova, P., Luca, M. and Choi, Y. (2013) "Where not to eat? Improving public policy by predicting hygiene inspections using online reviews", in *Proceedings of the 2013 Conference on Empirical Methods in Natural Language Processing*, Seattle, WA, USA, pp. 1443-1448.
- Lee, C. K. H. (2022) "How guest-host interactions affect consumer experiences in the sharing economy: New evidence from a configurational analysis based on consumer reviews", *Decision Support Systems*, Vol 152, Article 113634.
- Leist, A. K., Klee, M., Kim, J. H., Rehkopf, D. H., Bordas, S., Muniz-Terrera, G. and Wade, S. (2021) "Machine learning in the social and health sciences", *arXiv preprint arXiv:2106.10716*.
- Peng, N., Chen, A. and Hung, K.-P. (2017) "The effects of teppanyaki restaurant stimuli on diners' emotions and loyalty", *International Journal of Hospitality Management*, Vol 60, pp. 1-12.
- Schomberg, J. P., Haimson, O. L., Hayes, G. R. and Anton-Culver, H. (2016) "Supplementing public health inspection via social media", *PLoS ONE*, Vol 11, No. 3, Article e0152117.

- Siering, M. (2021) "Leveraging online review platforms to support public policy: Predicting restaurant health violations based on online reviews", *Decision Support Systems*, Vol 143, Article 113474.
- Siering, M. and Janze, C. (2019) "Information processing on online review platforms", *Journal of Management Information Systems*, Vol 36, No. 4, pp. 1347-1377.
- Stratigi, M., Li, X., Stefanidis, K. and Zhang, Z. (2019) "Ratings vs. reviews in recommender systems: A case study on the Amazon Movies Dataset", In: Welzer, T. et al. (eds.) *New Trends in Databases and Information Systems. ADBIS 2019. Communications in Computer and Information Science*, Vol 1064, Springer, Cham.
- Van Nguyen, T., Zhou, L., Chong, A. Y. L., Li, B. and Pu, X. (2020) "Predicting customer demand for remanufactured products: a data mining approach", *European Journal of Operational Research*, Vol 281, No. 3, pp. 543-558.
- von Helversen, B., Abramczuk, K., Kopeć, W. and Nielek, R. (2018) "Influence of consumer reviews on online purchasing decisions in older and younger adults", *Decision Support Systems*, Vol 113, pp. 1-10.
- Wang, Y., Zhang, M., Tse, Y. K. and Chan, H. K. (2020) "Unpacking the impact of social media analytics on customer satisfaction: do external stakeholder characteristics matter?", *International Journal of Operations & Production Management*, Vol 40, No. 5, pp. 647-669.

The Moderating Role of Social Media Advertising in Customers' Purchase Intention

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Abstract: Social media advertising has been studied from different perspectives in the last decade. This research aimed to investigate how the advertising relevance moderates the relationship between social media advertising and customers' purchase intention. Social media networks advertising is a strategy that can be used to enhance the credibility of a promotional message from the brands, making the advertisement more persuasive and credible. The study included 1973 respondents, aged between 18 and 60 years ($M = 29.60$; $SD = 9.73$) with a majority of female respondents (53.0%). To measure Purchase intention, a composite variable was created, consisting of the four items developed by Duffett (2015), namely: (i) I will buy the products I see in the commercials; (ii) I wish to buy the products that are advertised in the commercials; (iii) I am likely to buy the products I see in the commercials; and (iv) I intend to buy the products I see in the commercials. Data analysis revealed that the most purchased products through online advertising on social networks are mass consumption products (71.7%), which are commercialized in large retailers. Based on these results, it was considered relevant to understand whether the relevance attributed to advertising moderates the relationship between online advertising on social networks and purchase intention. Data analysis revealed that, online advertising on social networks and the relevance attributed to advertising are analyzed separately, both variables significantly influence consumers' purchase intention. However, when they are in interaction, the effect is no longer significant. The positive effect of interaction suggests the tendency to buy mass consumption products through online advertising on social networks is greater when consumers consider advertising relevant.

Keywords: Social Media Advertising, Purchase Intention, Advertising Relevance, Mass Consumption Products.

1. Introduction

A study carried out by the Marktest Group (2022) revealed that the number of users of social networks has been increasing significantly, verifying that in the last decade the values quadrupled, going from 17.1% to 68.5%. In Portugal, it is estimated that around 85.0% of the population frequently uses the internet, that is, more than 8 million users and more than five million shop online. It was also found that four out of ten users have already purchased a product through a social network.

Globally, today more than half of the world uses social media (59.0%), which means 4.76 billion people. At present, figures show that 137 million new users came online in the last 12 months (DataReportal, 2023). Using social media is one of the most popular online activities. In 2021, more than 4.26 billion people used social media worldwide, a number projected to increase to nearly six billion by 2027 (Statista, 2023).

The market research numbers mentioned above shows that most consumers around the world are engaged and actively communicate on social media globally. According to figures published by Statista (2023), Facebook was the first social network to exceed one billion registered accounts and currently has approximately 2.7 billion monthly active users, making it the most popular social network in the world.

After the success of Facebook in the market, several authors started research about Facebook, Google+, Snapchat, YouTube, Twitter and Tiktok (Arora et al, 2019; Kim and Kim, 2018; Lee and Kim, 2022; Meliawati, Gerald and Aruman, 2023; Shareef et al, 2017).

The advertising investment figures refer to the segment of social media advertising that is projected to reach 269 billion US dollars in 2023 worldwide (Statista, 2023).

In this sense, it becomes relevant to study the impact of advertising carried out by brands on social networks on the consumer's purchase intention, a topic that has been studied from different perspectives (Alalwan, 2018).

2. Literature review

Advertisements made in the online advertising format (ads made for Web 1.0 applications) allow companies to carry out more informative and interactive (bidirectional) communication with their customers (Barreda et al, 2016; Swani et al, 2017), which does not happen with advertising in traditional mass media. Therefore, online and social media advertisements can help companies achieve many marketing objectives such as creating awareness in customers, building customer awareness, shaping customer perception.

Social media ads are a form of Internet advertising in Web 2.0, that allows customers to have different perceptions and experiences when interacting with social media ads. This is also due to the nature of social media ads as they empower customers to be more engaged (e.g., like, reshare, comment, post, and learn) with targeted ads (Tuten and Solomon, 2017).

Digital advertising has similar characteristics to traditional advertising, such as creativity, which in digital is associated with interactivity. The main characteristics of creativity in advertising are originality and quality in its production (Amabile, 1996; Amabile, 2020; Hennessey, 2010; Runco and Jaeger, 2012). Advertising creativity must be original, divergent, appropriate and have advertising production quality (Haberland and Dacin, 1992; Modig and Dahlen, 2019; Smith et al, 2007), criteria that can be applied through the image, the colors chosen, the slogan and the formats chosen (Franch, Lopes and Albiol, 2014). Creativity in advertising is original or unique and can be subjective according to the context as long as it has meaning from the perspective of brands on the one hand and above all from the perspective of the consumer.

Some studies argue that originality has positive effects on consumer responses to advertising as it helps to persuade consumers and leads them to purchase the product (Smith, Chen and Yang 2008). Additionally, professionals working in the field of advertising tend to define originality as the characteristic that best defines advertising creativity (Modig and Dahlen, 2019).

Advertising creativity must be original, divergent, appropriate, and have ad production quality (Ang, Lee and Leong, 2007; Haberland and Dacin, 1992; Modig and Dahlen, 2019; Smith et al, 2007).

Online advertising on social media attracts customers due to its level of creativity and attractiveness (Mazerant, et al, 2021). This adds to the high level of interactivity available on these platforms, which increases the level of ability for customers to control, contribute and interact with each other. All these criteria can be easily found in social networks advertising creativity.

Following the above, it is possible to consider that creativity in advertising on social networks encompasses the characteristics of originality, divergence, appropriateness, quality in production and interactivity.

2.1 Advertising on Social Networks and its Relationship With Consumers' Purchase Intention

The impact on purchase intention that advertising on social networks can have is a topic that has been studied by different authors. In their studies, Boateng and Okoe (2015a) highlight the importance of consumer attitude towards advertising on social networks and their behavioral response (Boateng and Okoe, 2015b).

Research by Yang et al (2017) conclude that consumer attitudes towards YouTube ads can lead to purchase intention. These consumers may have strong positive attitudes towards video advertising and what suggests that the consumer is done with the purchase process. Jin, Hu and He (2014) emphasize that most studies exploring online shopping focus on purchase intention rather than concrete online purchase behavior. Furthermore, Lin and Kim (2016) argue that consumers dislike Facebook ads and are less likely to purchase products as a result of interacting with Facebook ads.

The use of online advertising on social networks has attracted more attention than traditional advertising, which is reflected in consumers' purchase intention (Kim and Kim, 2020). Based on the literature, the first study hypothesis was formulated:

Hypothesis 1: Social Networks advertising has a positive impact on consumers' purchase intentions.

2.2 Relevance of Online Advertising on Social Networks

In his study, Jung (2017) finds that the perceived relevance of the advertisement, influences the effectiveness of advertising, as increased attention to ads and decreased ad avoidance. The main reason for rapidly increased use of social media advertising is its highly relevant targeting techniques based on users' personal information. Social media platforms provide advertisers with users' personal information such as gender, age, schools that users are currently attending or graduated from, language, job title, living and working places, interests, and friends.

In general, perceived relevance of advertising messages plays an important role in generating positive impact on advertising effectiveness in cognitive, affective, and behavioral areas. For example, higher relevance attracts more attention (Celsi and Olson, 1988; Pechmann and Stewart, 1990). Similarly, people are more likely to show a positive attitude toward advertising when it includes personally relevant products compared to less relevant products (Trampe et al, 2010). Studies from Pavlou and Stewart (2000) and also from Xia and Bechwati (2008) refers that perceived ad relevance also increases intention to purchase advertised products.

In view of the above, the following study hypothesis was formulated:

Hypothesis 2: Relevance of online advertising on social networks positively influences consumers' purchase intentions.

2.3 Advertising Relevance Moderates the Relationship Between Online Advertising on Social Media and Consumers' Purchase Intention.

The online consumer profile largely influences the intention to buy the products they see daily on social networks, so it is important to know the factors that trigger this motivation, including the relevance they attach to advertising (Abbas et al, 2020). According to Yeo et al (2022), technological advances and tools from the digital sphere have driven the construction of a new paradigm in the advertising industry, noting that the range of features and possibilities is considerably larger and more attractive.

Studies conducted in the recent past show that advertising carried out on social networks plays an extremely relevant role in consumer purchase intentions (Lin and Kim, 2016; Shareef et al, 2017).

In view of this evidence, the following research hypothesis was outlined:

Hypothesis 3: The relevance attributed to advertising moderates the relationship between online advertising through social networks and consumers' purchase intention.

3. Methodology

The present study was operationalized using a quantitative methodology, based on a hypothetico-deductive approach. Data were collected through a questionnaire survey with a non-probability sample. The use of this type of sample is related to the fact that only subjects who shop through social networks and are affected by the advertising on social network could participate in the study. A group of respondents with both of these characteristics is not easy to find. Therefore, the questionnaire was sent to researchers professional contacts who fulfill the requirements to be able to participate in the study. This first respondent group indicated people with the same characteristics or common interests. The sample grew as individuals invited new groups of participants. The snowball sampling method is often used in studies focused on social networks because it allows overcoming the disadvantages inherent in convenience samples (Dosek, 2021).

3.1 Sample Characterization

The sample of this study is characterized by: 1973 people aged between 18 and 60 years old ($M = 29.60$; $SD = 9.73$) participated in the study and were mostly female (53.0%). It was found that more than half of the respondents had qualifications equal to or greater than a degree (52.1%). It was also found that the average monthly household income of 40.9% of respondents is equal to or greater than €2.000 per month (Table 1).

Table 1: Respondents' demographic profiles

Sociodemographic variables	n (%)
Sex	
Male	927 (47.0%)
Female	1046 (53.0%)
Age group	
24 years old and below	738 (37.4%)
Between 25 and 34 years old	708 (35.9%)
35 years old and over	527 (26.7%)
Education Level	
Secondary school /Professional course	945 (47.9%)
Bachelor's or higher degree	1028 (52.1%)
Monthly net income of the household	
Lower or equal than €1.499	723 (36.6%)
Between €1.500 and €1.999	443 (22.5%)
Higher or equal than €2.000	807 (40.9%)

3.2 Measures

Data was collected using the instruments described below and a set of sociodemographic questions intended to characterize the sample (e.g., sex, age, educational level).

Purchase intention: Four items were adapted from Duffett (2015), namely: (i) I will buy the products I see in the commercials; (ii) I wish to buy the products that are advertised in the commercials; (iii) I am likely to buy the products I see in the commercials; and (iv) I intend to buy the products I see in the commercials. This scale uses a seven-point Likert scale (1 = Strongly disagree to 7 = Strongly agree). All items are formulated in a positive sense and the results are calculated by averaging the sum of all items, whereby high values suggest a greater purchase intention on the part of consumers.

Relevance attributed to advertising: Single item adapted from the scale developed by Zeng et al (2009; Online advertising on social networks is relevant to me). The answers were given using a dichotomous scale in which zero corresponds to No and one corresponds to Yes.

Online advertising on social networks: Single item based on the studies developed by Zhu and Chang (2016; I am strongly influenced by online advertising on social networks). Like the Relevance attributed to advertising, this item was also evaluated using a dichotomous scale (0 = No and 1 = Yes).

According to Dolbier et al (2005), this format is the most appropriate when you want a quick answer and easy interpretation. Both items were answered using a seven-point Likert agreement/disagreement scale. Despite this type of scale being frequently criticized, due to the impossibility of calculating its psychometric indicators, Littman et al (2006) argued that its use has advantages over scales consisting of several items, as it allows for more effective results.

3.3 Procedures

The data were mostly collected in the Metropolitan Area of Lisbon. Items that evaluate online advertising on social networks, the relevance attributed to it, the purchase intention and the set of sociodemographic questions were inserted into Google Forms. The link was sent by e-mail to the contacts of the researchers' professional networks. In the first part of the questionnaire an explanatory text was included on the objectives of the study, the scope of its realization and the estimated time for its completion (about five minutes). It was also ensured that responses would be treated in a completely confidential manner and that all directives of the General Data Protection Regulation of the European Union [Regulation (EU) No. 679/2016 of the European Parliament and of the Council, of 27 April] would be respected. The responses were analyzed using the statistical software Statistical Package for the Social Sciences (SPSS; version 29).

4. Results

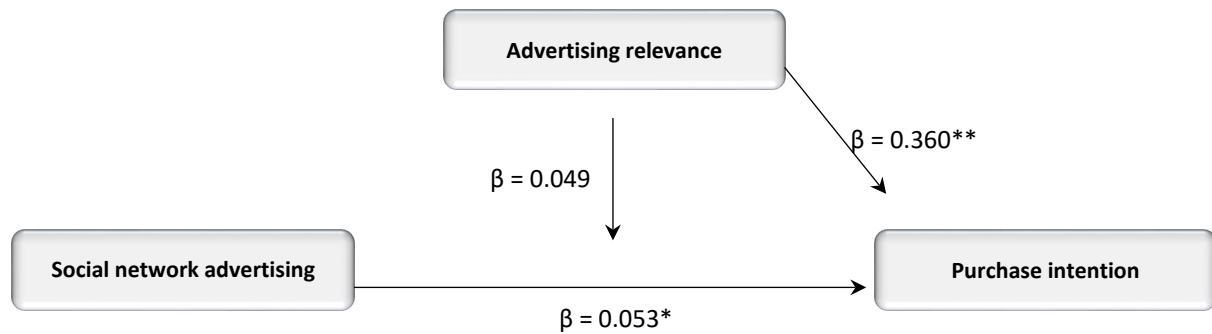
Data analysis revealed that 76.3% of consumers considered themselves to be strongly influenced by online advertising on social networks. Given these results, it was intended to find out which products are most purchased through this digital medium and it was found that they were the mass consumption products (e.g., food, hygiene, household cleaning), followed by those that fall into the category of Fashion and beauty (Table 2).

Table 2: Most frequently purchased products

Products	n (%)
Mass consumption products	1415 (71.7%)
Fashion and beauty	1264 (64.1%)
Culture and leisure	725 (36.7%)
Technology and informatics	442 (22.4%)

The literature review on purchase intentions drew our attention to the fact that they can be influenced by the gender of consumers (Lopes et al, 2022), so it was considered pertinent to compare means according to this sociodemographic variable. The results revealed that women have higher mean values ($M = 4.59$; $SD = 1.20$) when compared to men ($M = 4.43$; $SD = 1.31$) with regard to purchase intention, with statistically significant differences [$t_{(1971)} = -2.728$, $p < 0.05$].

The next step in the investigation was to assess whether the relevance attributed to advertising moderates the existing relationship between online advertising on social networks and purchase intention (Figure 1). For this purpose, a composite variable formed by the four items that assess the intention was created and it was found that it has a very satisfactory Cronbach's alpha coefficient ($\alpha = 0.89$), which allowed us to proceed with the analysis (Marôco, 2021). As previously mentioned, social network advertising and advertising relevance were measured using dummy variables, where zero means absence of the attribute (Social network advertising influence / Advertising relevance) and one means the presence of the attribute.

**Figure 1: Moderation Model**

Data analysis revealed that when online advertising on social networks ($\beta = 0.053$, $t = 2.234$, $p < 0.05$; Hypothesis 1) and the relevance attributed to advertising ($\beta = 0.360$, $t = 8.814$, $p < 0.001$; Hypothesis 2) are analyzed separately significantly influence the purchase intention of consumers, but when they are in interaction, the effect is no longer significant ($\beta = 0.049$, $t = 0.496$, $p = 0.620$; Hypothesis 3). The positive effect of interaction suggests the tendency to buy fast-moving products through online advertising on social networks is greater when consumers consider advertising relevant.

5. Discussion

Social networks are rooted in our daily lives, and it is increasingly common for us to be influenced by advertising included in them, often without realizing it (Appel et al, 2020). As such, Rodríguez et al (2020) argue that the use of digital tools is fundamental for organizations that want to promote their products or services, since consumers' purchase intentions are largely influenced by the advertising they see on social networks. These conclusions are like those found in this investigation, which allowed us to validate the first study hypothesis. Guthrie et al (2021), add that in recent years there has been a significant increase in online purchases of fast-moving consumer products, namely those related to well-being and personal care.

It was also found that purchase intention is significantly influenced by the relevance attributed to advertising, which allowed us to corroborate the second research hypothesis. These results are in line with the studies by Aloqool and Alsmairat (2022) according to which consumers tend to shop online when they consider that the advertising presented by the brand meets their needs and expectations.

Finally, it was possible to verify that online advertising on social networks and the relevance attributed to advertising have a significantly positive impact on consumers' purchase intention, but when the two variables are in interaction, this effect is no longer significant. These results did not allow validating the third hypothesis,

but they contribute to alert professionals responsible for online advertising on social networks that purchase intention tends to increase when consumers consider advertising relevant, as verified in the studies carried out by Yeo et al (2020). These conclusions are consistent with the work carried out by Nasir et al (2021) who state that consumers' purchase intention, in addition to being influenced by advertising on social networks, is largely motivated by the quality of the information transmitted and its relevance.

6. Conclusion

Online advertising on social networks has been growing in recent years, as it has been found that this type of strategy significantly increases consumers' purchase intentions, either due to the content of the message transmitted, its relevance or even due to the frequency with which it is viewed (Alalwan, 2018). This study is inserted in this context and sought to find out which are the most purchased products through online advertising on social networks.

Data analysis revealed that about two-thirds of the participants buy mainly mass consumption products because they feel strongly influenced by the online advertising they see on social networks. It was also possible to see that women tend to buy more products online than men. The research model was then tested, which revealed that online advertising on social networks and the relevance attributed to advertising have a significantly positive impact on consumers' purchase intentions. However, it was also found that when online social media advertising and advertising relevance interact, the effect on purchase intention is no longer significant.

The results obtained allowed us to validate all the hypotheses, since it was found that online advertising on social networks and the relevance attributed to it positively influence consumers' purchase intentions. Finally, it was found that the tendency to purchase FMCG products through online advertising on social networks is greater when consumers consider the advertising relevant.

The results of this study are very useful for marketing, communication, and advertising professionals as they make it clear that purchase intention tends to increase when consumers consider social networks advertising relevant.

References

- Abbas, A., Khan, I. A., Din, A. and Shazaib, M. (2020) "Impact of Advertising on Consumer Purchase Intention: A Study of Southern Punjab", *European Journal of Business and Management*, Vol. 12, No. 19, pp. 1-8.
<https://doi.org/10.7176/ejbm/12-19-01>
- Alalwan, A. A. (2018) "Investigating the impact of social media advertising features on customer purchase intention", *International Journal of Information Management*, Vol. 42, pp. 65-77.
<https://doi.org/10.1016/j.ijinfomgt.2018.06.001>
- Aloqool, A. and Alsmairat, M. (2022) "The impact of social commerce on online purchase intention: The mediation role of trust in social network sites", *International Journal of Data and Network Science*, Vol. 6, No 2, pp. 509-516.
<https://doi.org/10.5267/j.ijdns.2021.12.003>
- Amabile, T. M. (1996) *"Creativity and innovation in organizations"* (Vol. 5), Harvard Business School, Boston.
- Amabile, T. M. (2020) "Creativity, artificial intelligence, and a world of surprises", *Academy of Management Discoveries*, Vol. 6, No. 3, pp. 351-354. <https://doi.org/10.5465/amd.2019.0075>
- Ang, S. H., Lee, Y. H. and Leong, S. M. (2007) "The ad creativity cube: Conceptualization and initial validation", *Journal of the Academy of Marketing Science*, Vol. 35, pp. 220-232. <https://doi.org/10.1007/S11747-007-0042-4>
- Appel, G., Grewal, L., Hadi, R. and Stephen, A. (2020) "The future of social media in marketing", *Journal of the Academy of Marketing Science*, No. 48, pp. 79-95. <https://doi.org/10.1007/s11747-019-00695-1>
- Araujo, C. J., Perater, K. A., Quicho, A. M. and Etrata, A. (2022) "Influence of tiktok video advertisements on generation z's behavior and purchase intention" *International Journal of Social and Management Studies*, Vol. 3, No. 2, pp. 140-152.
<https://doi.org/10.5555/ijosmas.v3i2.123>
- Arora, A., Bansal, S., Kandpal, C., Aswani, R. and Dwivedi, Y. (2019) "Measuring social media influencer index-insights from Facebook, Twitter and Instagram", *Journal of retailing and consumer services*, Vol. 49, pp.86-101.
<https://doi.org/10.1016/j.jretconser.2019.03.012>
- Barreda, A. A., Bilgihan, A., Nusair, K. and Okumus, F. (2016) "Online branding: Development of hotel branding through interactivity theory", *Tourism Management*, Vol. 57, pp. 180-192. <https://doi.org/10.1016/j.tourman.2016.06.007>
- Boateng, H. and Okoe, A. F. (2015a) "Consumers' attitude towards social media advertising and their behavioural response: The moderating role of corporate reputation", *Journal of Research in Interactive Marketing*, Vol. 9, No. 4, pp. 299-312. <https://doi.org/10.1108/JRIM-01-2015-0012>
- Boateng, H. and Okoe, A. F. (2015b) "Determinants of consumers' attitude towards social media advertising", *Journal of Creative Communications*, Vol. 10, No. 3, pp. 248-258. <https://doi.org/10.1177/09732586156144>

- Celsi, R. L. and Olson, J. C. (1988) "The role of involvement in attention and comprehension processes", *Journal of Consumer Research*, Vol. 15, No. 2, pp. 210-224. <https://doi.org/10.1086/209158>
- DataReportal (2023) *Global Social Media Statistics*. Retrieved in <https://datareportal.com/social-media-users>.
- Dixon, S. (2023) *Number of global social network users 2017-2027*. Statista.
- Dolbier, C., Webster, J., McCalister, K., Mallon, M. and Steinhardt, M. (2005) "Reliability and validity of a single-item measure of job satisfaction", *American Journal of Health Promotion*, Vol. 19, No. 3, pp. 194-198. <http://dx.doi.org/10.4278/0890-1171-19.3.194>.
- Dosek, T. (2021) "Snowball sampling and Facebook: how social media can help access hard-to-reach populations", *Political Science & Politics*, Vol. 54, No. 4, pp. 651-655. <https://doi.org/10.1017/S104909652100041X>
- Duffett, R. (2015) "Facebook advertising's influence on intention-to-purchase and purchase amongst Millennials", *Internet Research*, Vol. 25, No. 4, pp. 498-526. <https://doi.org/10.1108/IntR-01-2014-0020>
- Franch, E. B., Lopes, P. and Albiol, C. B. (2014) "The creativity of the outdoor advertising in the mobile sector: A Case Study in Spain and Portugal", *Análisi*, Vol. 51, pp. 17-34. <http://dx.doi.org/10.7238/a.v0i51.2006>
- Grupo Marktest (2022) *Os Portugueses e as Redes Sociais 2022*, Grupo Marktest, Lisbon.
- Guthrie, C., Fosso-Wamba, S. and Arnaud, J. (2021) "Online consumer resilience during a pandemic: An exploratory study of e-commerce behavior before, during and after a COVID-19 lockdown", *Journal of retailing and consumer services*, Vol. 61, pp. 1-15. <https://doi.org/10.1016/j.jretconser.2021.102570>.
- Haberland, G. S. and Dacin, P. A. (1992) "The development of a measure to assess viewers' judgments of the creativity of an advertisement: A preliminary study", *Advances in Consumer Research*, Vol. 19, 817-825.
- Hennessey, B. A. (2010) *The creativity: motivation connection*, Cambridge University Press, NY, USA.
- Jin, L., Hu, B. and He, Y. (2014) "The recent versus the out-dated: An experimental examination of the time-variant effects of online consumer reviews", *Journal of Retailing*, Vol. 90, No. 4, pp. 552-566. <https://doi.org/10.1016/j.jretai.2014.05.002>
- Jung, A. R. (2017) "The influence of perceived ad relevance on social media advertising: An empirical examination of a mediating role of privacy concern. *Computers in human behavior*, Vol. 70, pp. 303-309. <https://doi.org/10.1016/j.chb.2017.01.008>
- Kim, D. and Kim, H. (2021) "Influencer advertising on social media: The multiple inference model on influencer-product congruence and sponsorship disclosure", *Journal of Business Research*, Vol. 130, pp. 405-415. <https://doi.org/10.1016/j.jbusres.2020.02.020>
- Lee, J. and Kim, S. (2022) "Social media advertising: The role of personal and societal norms in page like ads on Facebook", *Journal of Marketing Communications*, Vol. 28, No. 3, pp. 329-342. <https://doi.org/10.1080/13527266.2019.1658466>
- Littman, A., White, E., Satia, J., Bowen, D. and Kristal, A. (2006) "Reliability and Validity of 2 Single-Item Measures of Psychosocial Stress", *Epidemiology*, Vol. 17, No. 4, pp. 398-403. <https://doi.org/10.1097/01.ede.0000219721.89552.51>
- Liu-Thompkins, Y. (2019) "A decade of online advertising research: What we learned and what we need to know" *Journal of advertising*, Vol. 48, No. 3, pp. 1-13. <https://doi.org/10.1080/00913367.2018.1556138>
- Lopes, P., Rodrigues, R. and Varela, M. (2022) "Social Networks Clothes Shopping and the Influence of Brand Image and Perceived Benefits on Purchase Intention". In *Proceedings of the 9th European Conference on Social Media* (pp. 95-102), Poland Pedagogical University of Krakow, Krakow.
- Marôco, J. (2021) *Análise estatística com o SPSS Statistics [Statistical Analysis with SPSS Statistics]*, Report Number, Lisbon.
- Mazerant, K., Willemsen, L. M., Neijens, P. C. and van Noort, G. (2021) "Spot-on creativity: Creativity biases and their differential effects on consumer responses in (non-) real-time marketing" *Journal of Interactive Marketing*, Vol. 53, No. 1, pp. 15-31. <https://doi.org/10.1016/j.intmar.2020.06.00>
- Meliawati, T., Gerald, S. C. and Aruman, A. E. (2023) "The Effect of Social Media Marketing TikTok and Product Quality Towards Purchase Intention" *Journal of Consumer Sciences*, Vol. 8, No. 1, pp.77-92. <https://doi.org/10.29244/jcs.8.1.77-92>
- Modig, E. and Dahlen, M. (2020) "Quantifying the Advertising-Creativity Assessments of Consumers Versus Advertising Professionals: Does It Matter Whom You Ask?", *Journal of Advertising Research*, Vol. 60, No. 3, pp. 324-336. <https://doi.org/10.1002/acp.3864>
- Nasir, V., Keserel, A., Surgit, O. and Nalbant, M. (2021) "Segmenting consumers based on social media advertising perceptions: How does purchase intention differ across segments?", *Telematics and Informatics*, Vol. 63, pp. 1-13. <https://doi.org/10.1016/j.tele.2021.101687>
- Pavlou, P. and Stewart, D. W. (2000) "Measuring the effects and effectiveness of interactive advertising: A research agenda" *Journal of Interactive Advertising*, Vol. 1, No. 1, pp. 61-77.
- Pechmann, C. and Stewart, D. W. (1990) "The effects of comparative advertising on attention, memory, and purchase intentions" *Journal of Consumer Research*, Vol. 17, No. 2, pp. 180-191.
- Regulamento (UE) n.º 679/2016 do Parlamento Europeu e do Conselho, de 27 de abril. *Jornal Oficial da União Europeia*, L 119, 1-88.
- Rodríguez, M., Pineda, D. and Castro, C. (2020) "Tendencias del marketing moderno: Una revisión teórica", *Revista Espacios*, Vol. 41, No. 27, pp. 306-322.
- Rosengren, S., Eisend, M., Koslow, S. and Dahlen, M. (2020) "A meta-analysis of when and how advertising creativity works" *Journal of Marketing*, Vol. 84, No. 6, pp. 39-56. <https://doi.org/10.1177/00222429209292>

- Runco, M. A. and Jaeger, G. J. (2012) "The standard definition of creativity" *Creativity research journal*, Vol. 24, No. 1, pp. 92-96. <https://doi.org/10.1080/10400419.2012.650092>
- Shareef, M. A., Mukerji, B., Dwivedi, Y. K., Rana, N. P. and Islam, R. (2019) "Social media marketing: Comparative effect of advertisement sources", *Journal of Retailing and Consumer Services*, Vol. 46, pp. 58-69. <https://doi.org/10.1016/j.jretconser.2017.11.001>
- Smith, R. E., Chen, J. and Yang, X. (2008) "The impact of advertising creativity on the hierarchy of effects" *Journal of advertising*, Vol. 37, No. 4, pp. 47-62.
- Smith, R. E., MacKenzie, S. B., Yang, X., Buchholz, L. M. and Darley, W. K. (2007) "Modeling the determinants and effects of creativity in advertising", *Marketing science*, Vol. 26, No. 6, pp. 819-833. <https://doi.org/10.1287/mksc.1070.0272>
- Statista (2022) *Digital Advertising Report 2022 - Social Media Advertising*. Retrieved 16.3.2022, In <https://www.statista.com/outlook/dmo/digital-advertising/social-media-advertising/worldwide>
- Swani, K., Milne, G. R., Brown, B. P., Assaf, A. G. and Donthu, N. (2017) "What messages to post? Evaluating the popularity of social media communications in business versus consumer markets", *Industrial Marketing Management*, Vol. 62, pp. 77-87. <https://doi.org/10.1016/j.indmarman.2016.07.006>
- Trampe, D., Stapel, D. A., Siero, F. W. and Mulder, H. (2010) "Beauty as a tool: The effect of model attractiveness, product relevance, and elaboration likelihood on advertising effectiveness", *Psychology & Marketing*, Vol. 27, No. 12, pp. 1101-1121. <https://doi.org/10.1002/mar.20375>
- Tuten, T. L. and Solomon, M. R. (2017) *Social media marketing*, Sage New, Jersey.
- Xia, L. and Bechwati, N. N. (2008) "Word of mouse: The role of cognitive personalization in online consumer reviews", *Journal of interactive Advertising*, Vol. 9, No. 1, pp. 3-13. <https://doi.org/10.1080/15252019.2008.10722143>
- Yang, K. C., Huang, C. H., Yang, C. and Yang, S. Y. (2017) "Consumer attitudes toward online video advertisement: YouTube as a platform". *Kybernetes*, Vol. 46, No. 5, pp. 840-853. <https://doi.org/10.1108/K-03-2016-0038>
- Yeo, S., Tan, C., Lim, K., Leong, J. and Leong, Y. (2020) "Effects of Social Media Advertising on Consumers' Online Purchase Intentions", *Global Business and Management Research: An International Journal*, Vol. 12, No. 1, pp. 89-107.
- Zeng, F., Huang, L. and Dou, W. (2009) "Social factors in user perceptions and responses to advertising in online social networking communities", *Journal of Interactive Advertising*, Vol. 10, No. 1, pp. 1-13. <https://doi.org/10.1080/15252019.2009.10722159>
- Zhu, Y. and Chang, J. (2016) "The key role of relevance in personalized advertisement: Examining its impact on perceptions of privacy invasion, self-awareness, and continuous use intentions", *Computers in Human Behavior*, Vol. 65, pp. 442-447. <https://doi.org/10.1016/j.chb.2016.08.048>

Communication Agencies and Social Media as a Communication Strategy: A Portuguese Case Study

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Abstract: The topic "communication agencies and social media as a communication strategy" arose from the need to understand how digital platforms, namely social media, are used as a communication strategy in the business world. Nowadays, organisations are increasingly aware of the importance of digital platforms and social media in the communication of their products and services, as well as their brand image. The online communication of an organisation has to be coordinated, the different channels and tools have to be in harmony and the message and image have to articulate with each other. Thus, the research question "What is the importance of digital platforms and social media as a communication strategy? The research objectives are: (1) to understand the importance of using digital platforms and social media as a communication strategy for organisations; (2) to analyse the management and production of digital content by a communication agency; (3) to identify what type of company requests a communication strategy; (4) to analyse the change in communication strategies after COVID-19. Methodologically, this case study will describe the communication strategy of a communication agency, using digital platforms and social media, and how it applies it in the communication management of client companies. This analysis will be enriched by an interview with the CEO and Creative Director of the communication agency under study. The results reiterate that companies are increasingly investing in communication through digital platforms, with the aim of reaching the consumer faster and more easily. Through this research it was possible to find out that digital platforms have a great importance in the companies' communication strategy, being fundamental for their dissemination and contact with the potential consumer.

Keywords: Communication Agency, Communication Strategy, Social Media, Digital Platforms, Digital Marketing

1. Introduction

Nowadays, companies are investing in communication through digital platforms and social media, in order to reach the consumer faster and more easily. Digital platforms include email, social networks, websites, online shops, among others. The technological development made the use of digital platforms increase, so there was a need to study their use as a communication strategy. Through this research it was possible to find out that digital platforms have a great importance in the companies' communication strategy, being crucial in their dissemination and contact with the potential consumer.

Regardless of the size of the organisation, communication creates the company's brand image, playing a crucial role in the achievement of objectives. In this way, the communication strategy must be outlined and appropriate according to the company's objectives. It should contain contents that are part of the company's context and that, somehow, make sense to its public. The communication strategy should be related to the main strategy of the organisation, so that it is coherent, consistent and effective.

Currently, organisations in their communication strategies no longer talk about the brand or the qualities of their products/services, but rather about telling a good story, thus establishing a more human and close connection with their target audience. And marketing 5.0 (Kotler, 2021) is a reflection of this, which represents the use of technology and the human factor to create, communicate, deliver and increase the value of the consumer journey. This new era includes artificial intelligence, natural language processing, sensors, robotics, augmented reality, virtual reality, internet of things and the blockchain.

This exploratory study seeks to ascertain what is the importance of digital platforms and social media as a communication strategy?. In this way, this research is based on a case study and will describe the communication strategy of a communication agency, using digital platforms and social media, and how it applies it in the management of the client companies' communication. This analysis will be enriched by an interview with the Executive Director of the communication agency under study.

2. Theoretical framework

2.1 Communication strategy in organisations

Strategic communication comprises different forms of goal-oriented communication inside and between organizations, their stakeholders and the society (Falkeimer & Heide, 2018). Strategic communication can be seen as a set of processes and actions, which aim to create an effective communication in the various channels and for the various audiences, so that the objectives are achieved. According to Marchiori (2011), communication in organisations is directly linked to the planning and management processes that determine the organisation's strategies (2011, p. 164). Viewed in a strategic way, communication can help the organization to achieve its objectives, being important to select information that are part of the company's context and that make sense to the target audience, to the point of being able to perform an effective exchange of information, generate meaning and share knowledge. Strategic organizational communication, according to Kunsch (2018), is related to the pragmatic view of communication, with a view to effectiveness and results.

Organizations value communication as a strategic management tool, practice it in a professional manner and invest in the development of processes capable of meeting the expectations of their audiences because there is an increasing awareness of the fundamental importance of communication for the existence and performance of all organizations (Falkeimer & Heide, 2018). In fact, nowadays, defining a communication strategy is central to any organisation that wants to achieve its objectives (Cook *et al.*, 2007).

The communication strategy should be related to the main strategy of the organisation, so that it is coherent, consistent and effective. In this sense, Argenti argues that to develop an effective communication strategy it is necessary to go through four phases (Argenti, 2014): the first part of the communication strategy has to do with the organization itself; the second phase is to analyse and identify the main stakeholders; the third phase is to transmit the messages effectively; and the last phase is to evaluate the response by the stakeholders, which should be subsequently evaluated to know the effectiveness of it and if the desired results were achieved.

Nowadays, with the advance of information and communication technologies, organisations have evolved, as have their communication strategies. People are increasingly researching and buying online, and organisations have to keep up with this evolution. Thus, digital platforms such as websites, blogs and social networks on the internet are increasingly important for organizations, being adopted as communication strategies (Bueno & Porem, 2018, p. 113).

Another point that also covers a communication strategy is the storytelling technique, that is, the act of telling stories. According to Baptista (2017), storytelling, seen from the perspective of communication strategy, corresponds to the narratives told through new communication technologies and new forms of social interaction. Baptista (2017) states that the storytelling approach has been used in several contexts, in order to achieve specific objectives, he also adds that in recent years, the concept has gained strength mainly in the areas of marketing and advertising, which use it as a method of announcement and sale of products and services. On the other hand, strategic social media influencer communication has become a major topic in strategic communication. Influencers can act as cooperation partners, integrating commercial content into organic narratives, or as independent critics (Enke & Borchers, 2021). For this, social media influencers are increasingly employed by organizations to amplify their strategic communication efforts (Enke & Borchers, 2021).

2.2 Communication agencies and their roles

In Portugal, the communication agencies arise after the 1974 Revolution, being that due to the dictatorial regime, the freedom of expression and the media were under censorship. According to Gonçalves (2013), organisations began to feel the need to create links with the press which led to the emergence of the first communication agencies.

Communication agencies are indispensable for an organization to relate effectively with the target audience. According to Eduardo (2005), communication agencies are specialised companies which have an impartial and global vision and normally follow all the world trends in the area of communication. As they have customers from several areas, communication agencies have contacts with different editorships of the communication vehicles, as well as with the community, associations and even suppliers (Eduardo, 2005, p. 37).

According to the Portuguese Association of Council Companies in Communication and Public Relations

(APECOM), a communication agency is a company that represents a client or set of clients in its relationship with a wide range of audiences, namely journalists (2017, p. 2).

The communication agencies may specialize in certain areas such as public relations or press office, however Mainieiri (2007, p. 4) argues that the name "Communication Agency" is used by agencies of public relations and press office in general, because they follow the standardization of names given to sectors and departments of companies, in an attempt to expand their area of action, and also to be more easily understood. Of the same opinion, Sebastião *et al.* (2012) refer that these agencies may be under several denominations, ranging from Press Advisory, to Communication Advisory, Communication Agency or Public Relations Agency, among others, all of them follow the same line of services provided. They are specialists in Corporate Communication and have a series of products and services that improve and facilitate the management of the company/organization for which they provide services (Sebastião *et al.* 2012, p. 261).

As communication agencies work in several areas, Baptista (2013) states that communication agency professionals are usually trained in advertising, journalism or public relations. The services that communication agencies provide vary according to their size. They may provide a general service among the various areas, or act only in some of these specific areas assuming a role of specialisation. According to Sebastião *et al.* (2012), the services of communication agencies should be divided into three categories of analysis: organisation and planning; communication; and execution. And in which four subcategories were created: public relations and traditional media; public relations and new media; public relations and politics; and internal or financial communication.

Communication agencies define communication strategies through consultancy in communication and public relations. According to APECOM (2017), this is the way to implement relationship actions with the different audiences, promote the image and reputation of their clients, minimize crisis situations that may affect that same image and measure the return on the work developed.

In conclusion, communication agencies aim to publicise and promote a brand or a company, so that it maintains a good position in the market, as well as providing an improvement in the quality of services and products. They are recognised as advisory service providers, but also as partners in the implementation of all communication in companies.

2.3 Main strategies of digital marketing

Marketing has been evolving in tandem with consumer and business behaviours. Marketing 1.0 was born in the Industrial Revolution, in which the main focus was on the product and its mass sale. According to Kotker *et al.* (2010, p. 3), "the goal was to standardize and scale up to bring about the lowest possible costs of production so that these goods could be priced lower and made more affordable to more buyers".

Marketing 2.0 emerges in the information age, in which consumers were informed and already able to compare several offers of similar products. At this stage the focus was on the consumer and his or her satisfactions, and according to Kotler *et al.* (2010, p. 4), "consumers are better off because their needs and wants are well addressed. They can choose from a wide range of functional characteristics and alternatives. Today's marketers try to touch the consumer's mind and heart."

Meanwhile, marketing 3.0 or the era of human value appeared. Instead of treating people as mere consumers, there was an approach to the more human side. For Kotler *et al.* (2010, p. 4), consumers "search for companies that address their deepest needs for social, economic, and environmental justice in their mission, vision, and values". The focus was on consumer satisfaction, not only on the functional and emotional side, but also on the human relationship side linked to the product.

Marketing 4.0 is a complement to the previous segment, that is, companies must continue to care about human value, but take it to the digital, having a connection between these two points. For Kotler *et al.* (2017, p. 46), marketing 4.0 "is a marketing approach that combines online and offline interaction between companies and customers". In this era, digital interaction and brand flexibility are no longer enough, and authenticity is increasingly valued.

The most recent stage, and the one we live in, is marketing 5.0, which represents the use of technology and the human factor to create, communicate, deliver, and increase the value of the consumer journey. According to Kotler *et al.* (2021, p. 5) marketing 5.0 "materializes against the backdrop of three major challenges: generation gap, prosperity polarization, and the digital divide. It is the first time in history that five generations living

together on Earth have contrasting attitudes, preferences, and behaviors". The main focus of this era is technology for humanity, which includes artificial intelligence, natural language processing, sensors, robotics, augmented reality, virtual reality, the internet of things and the blockchain (cryptocurrency mining service).

Over the years it is possible to perceive the evolution of marketing and all its surroundings. Nowadays it is possible to access a wider range of products, services, prices and faster and more immediate means of purchase. Companies currently have a wide variety of opportunities to offer new services and products, using online communication techniques. Digital marketing is an aspect of marketing that has granted various tools to organizations, so that it is possible, achievable and more practical to put into practice the various communication strategies. Digital marketing and then a set of marketing and advertising strategies, applied to the Internet and the new consumer behaviour when browsing. It is not about one or another action, but a coherent and effective set of actions that create a permanent contact of a company with its customers (Torres, 2018, p. 7).

According to Chaffey (2019), digital marketing has transformed the way organisations communicate with their target audience. Consumers now have access to a much wider choice of entertainment, products, services and prices from different suppliers, and a more convenient way to select and purchase items. Organisations have the opportunity to expand into new markets, offer new services and interact with their target audience through new means.

Digital marketing is seen as the set of activities that an organisation performs online with the aim of attracting new business, improving sales, creating relationships, strengthening and expanding brand identity. Digital marketing is therefore an important tool for the evolution of the company. Smith and Chaffey enumerate the benefits of digital marketing through "5 Ss": Sell (Grow sales); Serve (Add value); Speak (Get closer to customers); Save (Save costs); Sizzle (Extend the brand online) (Smith & Chaffey, 2017, p.24).

Torres (2018) exposes that digital marketing should be composed of seven strategic actions: content marketing; social media marketing; email marketing; viral marketing; online research; online advertising and monitoring. For Torres (2018), it is necessary to take into account that on the internet consumers are always inserted in various environments and contexts, in an interconnected and dynamic way. This means that each strategic action alone can and will interfere in the others and, in many cases, it is difficult to separate exactly one strategic action from another.

In this sense, companies need to ensure an online presence, that is, digital marketing is increasingly seen as something essential, in order to promote and publicize the brand, products and services. It is through the set of actions and strategies that digital marketing encompasses that it is possible to build a strong presence on the internet, find the target audience and build a relationship with them, and even analyse the results in real time and with more precision.

3. Methodology

This exploratory study has as its starting point the following research question: "What is the importance of digital platforms as a communication strategy for LIONSOUT?". Having said this, the objectives of the research are to:

1. understand the importance of using digital platforms and social media as a communication strategy for organisations;
2. analyse the management and production of digital content by a communication agency;
3. identify what type of company requests a communication strategy;
4. analyse the change in communication strategies after COVID-19.

The research, taking into account the objectives previously presented, starts from a case study, since it is focused on the work developed by the communication agency LIONSOUT, based in the north of Portugal, which plans communication strategies for other companies. In order to achieve these objectives, the methodology focuses on a descriptive and deductive analysis and is divided into two parts: first, the description and analysis of LIONSOUT's communication strategy and how it works digital communication strategies; and, second, the realization of a structured interview with the Executive Director of the LIONSOUT agency. The first part concerning the communication strategy of LIONSOUT, it is intended to describe what the clients' needs are, the steps that the agency follows, and what communication techniques/strategies are used.

On the other hand, the structured interview with the Executive Director of the Communication Agency, Dr. Fernando Lima, who does the planning and management of communication strategies oriented by LIONSOUT, was conducted face-to-face on 22 July 2022 from an interview script and lasted about 30 minutes. This interview

has as main objective to understand the importance of digital platforms as a communication strategy of an organization and what the impact that the Covid-19 pandemic had in the planning and communication strategies of organizations.

4. Results analysis

4.1 Description of LIONSOUT's Communication Strategy using Digital Platforms (Website, Online Store and Social Networks)

LIONSOUT is an international award-winning marketing and communications agency. Originating in Viana do Castelo since 2013, they opened offices in Porto in April 2019, and in Lisbon in March 2021. They define themselves as "an agency of lions", always on the lookout for the savannah of markets, which puts creativity at the service of new ambush techniques. Strategy is the paradigm of LIONSOUT. Strategic consultancy is present in all services and in the follow-up of each client. They defend primarily an integrated marketing communication approach, at the service of the increase of the value perception of "brands with spirit", their guerrilla war cry.

LIONSOUT when defining a communication strategy has always as a basis that the online communication of a brand must be coordinated, the different channels and tools must be in harmony, in tone, in message and in image and must articulate between themselves in a logic of mutual reinforcement. For the communication strategy to be functional, LIONSOUT needs to understand first of all some points related to the brand, such as:

- Do you need to make the brand more visible in the digital world?
- Do you want to improve the way the brand is perceived (positioning)?
- Do you need to strengthen the relationship with customers and target audience (engagement)?
- Do you want to increase sales?

Bearing in mind that all these objectives are interrelated, it is necessary to interpret the path a potential customer takes from the moment they have a consumption need, or one is generated for them, to the moment of purchase. This process is called the sales funnel. That being said, the two most important questions when devising a communication strategy across digital platforms are:

- How will I drive a visitor to my website or online shop?
- How will I make that visitor interested in the products and services I am communicating, in order to influence a buying decision?

The answer to the first question "How will I lead a visitor to my website or online shop?" leads us to identify two main paths:

- Through search on research engines, among which Google stands out;
- Through the viewing of a sponsored ad on social networks.

Starting with the first topic, for a website to have visibility in search engines, LIONSOUT uses two essential tools, one is Search Engine Optimization (SEO) and the other is Google Ads. SEO corresponds to a set of techniques used in the very development of the website or online shop that influence the search engines algorithms, in order to raise the ranking of a page through a particular keyword searched. While Google Ads is Google's ad service which consists of displaying sponsored ads associated with keyword searches on the Google search engine and its Display Network. The advertisements of Ads are displayed alongside search results on Google as well as on websites, blogs, news pages or Youtube videos.

Currently, it is on Google that consumers search for what to do, where to go and what to buy, which means that the reach of an advertisement is highly targeted on this search engine. By constructing a Google Ads campaign, it is possible to target the ads to a highly segmented audience that enables a certain qualified audience to be reached and that can bring measurable results with an increase in sales.

The answer to the second question "How will I make this visitor interested in the products and services I am communicating?" is Content Marketing. The efficiency of a brand's communication through the website or online shop depends on the quality of the experience that is offered to the visitor and potential customer. Product photography and concept photography, as well as the power of an advertising or explanatory video are powerful tools to help convert a visitor into a buyer.

The communication strategy also involves building an appealing website, involving the visitor with a narrative capable of arousing his interest, either through the relevance of the information, or through the exploration of

the storytelling technique.

As far as social media is concerned, most brands bet on Facebook, the most popular and used social network in Portugal. Facebook content planning and management follows King's (2015) analysis methodology, which defined a set of five metrics that analyse social media performance and trends, namely: activity metrics, audience metrics, interaction metrics, reference metrics and return on investment metrics. LIONSOUT uses mainly three metrics: activity, audience and interaction. Activity metrics are used to analyse the type of content produced for the Facebook page. With audience metrics, it is possible to observe the growth of followers on the social network. And finally, the interaction metric, which allows observing the interaction between users and publications.

Facebook presents some statistical data already predefined as: shares, views, reach, likes, among others. This data is divided into three groups: page data, publication data and video data. That said, and following the methodology defined by Dias and Amante (2018), seven Key Performance Indicators distributed by the three metrics defined previously were selected:

Table 1: Metrics and theirs Key Performance Indicators

Metrics	Key Performance Indicators
Activity	Type of publication
	Publication output
Audience	Page likes
	Page interactions
	Organic reach
Interaction	Interaction with publication
	Video viewing

(Source: Dias e Amante, 2018, p. 3)

Through monthly analysis of each client company's Facebook page, LIONSOUT obtains feedback and is able to better plan the strategies to be followed in content management in this social network. In fact, by establishing the correlation between activity metrics (type of posts and production of posts) with audience metrics (number of likes, page interactions and reach) and interaction metrics, LIONSOUT can understand the reach and engagement of the target audience and, depending on the results obtained, continue, improve or readapt the communication strategies on social networks.

4.2 Interview analysis

The interview with the Executive Director of the LIONSOUT Communication Agency, Dr. Fernando Lima, aimed to understand the importance of digital platforms as a communication strategy for an organisation. The questions were direct to the main objective. Thus, it was possible to analyse that, in the case of LIONSOUT, the use of digital platforms as a communication strategy is increasingly becoming a reality, especially social networks. For the interviewee, almost all the client companies want to invest in content management for social networks, because they consider that the public is increasingly focused on what is happening on social networks.

Nevertheless, the interviewee highlights that the use of these platforms in the communication strategy always depends on the company's goals. The advantages of a communication strategy through digital platforms are several, because it is possible to follow the consumer's behaviour; it is possible to segment the consumer, from age, profession, interests, geographical area and also to evaluate the strategy applied. While in a communication strategy by traditional methods this is not possible, it is not possible to understand the reach of that ad, the data of the people reached or the return on investment.

On the other hand, the interviewee highlights that both companies and the common citizen are aware that the world is increasingly visual, in which text is being surpassed by images and video, and in which the consumer wants to have information as quickly as possible. Thus, the content produced by LIONSOUT is planned monthly,

always taking into account the positioning of the brand, the objectives of the same, what you want to communicate and with whom you want to communicate. In this planning several factors are always taken into account, such as photography, video, text, illustration and podcasts. Similarly, the interviewee underlined that for there to be a good communication management it is necessary to have a link between strategy and planning. This connection will be reflected in the engagement, i.e. the interaction between the consumer and the brand, which can be easily measured through the social networks.

Another fact presented by the interviewee is that companies with fewer resources also use this type of service, taking into account that there is great flexibility in the budget for digital communication, making it often cheaper than communication through traditional media. In fact, communication through traditional media, such as radio and television, ends up being very expensive for companies with fewer resources.

Finally, regarding the impact that the Covid-19 pandemic had on companies' communication strategies, the interviewee highlighted that the pandemic only added even more importance to digital marketing and communication through digital platforms and social media. Due to the pandemic, people stayed at home longer, exploring digital platforms more and more. Therefore, if the internet was a strategic means of communication, after the pandemic, digital platforms, especially social media, as a resource and communication strategy grew exponentially. For the interviewee, more and more brands are paying attention to what is going on in the digital world and increasingly want to win the trust of the consumer especially through social media.

5. Discussion

LIONSOUT as a communication agency has been receiving more and more companies from the most diverse sectors of activity and size that want to grow their online presence. Consumer behaviours have changed, and consequently, the communication by the brands, as well as the strategies by the Communication Agencies had to follow this change. In this sense, there was an acceleration and reinforcement in the communication of organizations, which are increasingly aware of the importance of digital channels in the communication of their products and services. If consumers were already using digital media to keep up with the news of their favourite brands, with the COVID-19 pandemic, online shopping skyrocketed, with many consumers purchasing essential goods over the internet for the first time.

Many companies use communication agencies to manage digital platforms, such as social networks and the website/online shop, in order to build and implement the communication strategy appropriate to the company's context. And as mentioned by Kunch (2012, p. 217) and by our interviewee, Dr. Fernando Lima, the communication strategy should be defined according to the characteristics of the brand, products and services, target audience and communication objectives. This strategy will turn into creative, efficient and competitive content.

On the other hand, as through digital platforms it is possible to segment the public by age, profession, interests, education, tastes, companies take advantage of this to communicate with their potential consumers. Another potential advantage, mentioned by Cook et al (2007, p. 8) and by our interview, is the possibility of evaluation metrics, in which it is possible to analyse the reach of the strategy, as well as whether it is having the intended effectiveness. In case it is not going as planned, digital platforms allow making changes and readjustment in the communication strategy in a short period of time.

Overall, a large part of the companies bet on communicating on digital platforms, whether they are small or large. This happens because of the ease of communicating in social networks, which, compared to traditional means, is much simpler, versatile and economical. With the emergence of Covid-19, there was a growth in the bet on the digital world, which led to greater investment by companies in communication on the various digital platforms. At a time when people were more confined, they resorted to digital platforms for their purchases of goods and/or products, they also had the opportunity to make contact and get to know new companies. For LIONSOUT, it is perceptible the concern of organisations for their online presence through digital platforms, as they want to communicate with the consumer in a faster and more versatile way.

Regarding the content published on social networks, this is also part of the communication strategy and it is important to be related to the brand positioning, the objectives, what is intended to communicate and who is the audience in question. In the case of LIONSOUT there is always a previous monthly planning of the content, with several tools to consider, such as photography, video, text, illustration, podcasts. This planning aims to ensure that there is a strategic logic in coherence with the company's communication, in order to create engagement by the users of the platforms.

Finally, answering the research question "What is the importance of digital platforms and social media as a communication strategy for LIONSOUT?", it can be said that digital platforms and social media are important for the communication strategies adopted by LIONSOUT, to the extent that the consumer is increasingly present in the digital environment than in other media, such as newspaper or radio. As shown by the study of Marktest (2020), Portuguese spend an average of 96 minutes daily on social networks, which leads companies to invest in digital, i.e., to be in the same place as the consumer.

6. Conclusions

This is a case study on the importance of digital platforms as a communication strategy through the study of LIONSOUT Communication Agency. The subject under study is based on the fact that more and more Portuguese companies are investing in communication through digital platforms, in order to reach the consumer faster and easier. The technological development caused the use of digital platforms to increase, and the COVID-19 pandemic triggered the exponential growth of the use of several digital platforms, especially social networks. However, the vast majority of Portuguese companies, especially small and medium enterprises, were not prepared for the new digital demands caused by the pandemic. And so, they turned to communication agencies to respond to the digital market

Through this case study, it was possible to attest in a practical way, through the testimony and analysis of the work of a communication agency and a structured interview with its executive director, that digital platforms have nowadays a great importance in the communication strategy of companies, being crucial for their dissemination and contact with potential consumers. The data analysed demonstrate the growing importance of social media in the communication strategy of Portuguese companies.

Finally, we acknowledge the limitations of this study, since it focuses on a case study. Nevertheless, we believe that it is important to sustain the ideas and theoretical postulates on the importance of digital platforms and social media as a communication strategy from the analysis of the work carried out by communication companies and professionals in the field. Therefore, this case study is presented as a concrete testimony of what is happening in the Portuguese market of strategic communication, digital marketing and brand image creation.

References

- Adolpho, C. (2019) *Os 8 P's do Marketing Digital*. Alfragide: Leya.
- Almeida, R. (2020) Content Marketing em 2020: novidades, tendências e estatísticas. Internet. <https://blog.made2web.com/content-marketing-em-2020> (retrieved on 18th of March 2021)
- APECOM. (2017) O que faz uma Agência de Comunicação. Internet. <http://apecom.pt/wp-content/uploads/2017/05/O-que-faz-uma-Ag%C3%A2ncia-de-Comunica%C3%A7%C3%A3o.pdf> (retrieved on 17th of September 2020)
- Argenti, P. A. (2014) *Comunicación estratégica y su contribución a la reputación*. Madrid: LID Editorial.
- Baptista, D. (2017) *Uma nova perspectiva do conto: o storytelling na estratégia da comunicação empresarial*. Universidade de Aveiro. Internet. <https://ria.ua.pt/handle/10773/23889> (retrieved on 25th of January 2021)
- Baptista, I. M. (2013) *A importância das agências de comunicação em tempo de crise*. Universidade da Beira Interior. Internet. <https://ubibliorum.ubi.pt/handle/10400.6/1583> (retrieved on 20th of September 2020)
- Bueno, D. A., Porem, M. G. (2018) Comunicação estratégica e estratégias de comunicação em contexto midiático: estudo exploratório com micro, pequena e média empresa da cidade de Bauru (Brasil). *Revista Internacional de Relaciones Públicas*. Vol. VIII, Nº 16, 109-128.
- Cook, M., Lally, C., McCarthy, M., & Mischler, K. (2007) *Guidelines for the Development of a Communication Strategy*. Worcester Polytechnic Institute: New Horizon Centre.
- Chaffey, D., Ellis-Chadwick, F., Mayer, R., & Johnston, K. (2019) *Digital Marketing*. UK: Pearson.
- Dias, J. & Amante, M.J. (2018) O que nos dizem as métricas produzidas nas redes sociais? O exemplo da página de Facebook de uma Biblioteca de Ensino Superior. 13º Congresso Nacional de Bibliotecários, Arquivistas e Documentalistas. <http://hdl.handle.net/10071/16708>
- Enke, N., & Borchers, N. S. (2021). Social media influencers in strategic communication: A conceptual framework for strategic social media influencer communication. In *Social Media Influencers in Strategic Communication* (pp. 7-23). Routledge.
- Falkheimer, J., & Heide, M. (2018). *Strategic communication: An introduction*. Routledge.
- Jiang, H., & Men, R. L. (2017). Creating an engaged workforce: The impact of authentic leadership, transparent organizational communication, and work-life enrichment. *Communication research*, 44(2), 225-243.
- Kotler, P. Kartajaya, H., Setiawan, I. (2010) *Marketing 3.0 - From Products to Customers to the Human Spirit*. New Jersey: John Wiley & Sons, Inc., Hoboken.

- Kotler, P. Kartajaya, H., Setiawan, I. (2017) *Marketing 4.0 – Moving from Traditional to Digital*. New Jersey: John Wiley & Sons, Inc., Hoboken.
- Kotler, P. Kartajaya, H., Setiawan, I. (2021) *Marketing 5.0 – Technology for Humanity*. New Jersey: John Wiley & Sons, Inc., Hoboken.
- King, D. L. (2015) *Managing Your Library's Social Media Channels*. Vol. 51, Nº1. Chicago: American Library Association.
- Kunsch, M. M. K. (2002) *Planejamento de Relações Públicas na Comunicação Integrada*. 2ª Edição. São Paulo: Summus.
- Kunsch, M. M. K. (2003) *Planejamento de Relações Públicas na Comunicação Integrada*. 4ª Edição. São Paulo: Summus.
- Kunsch, M. M. K. (2012) As dimensões humana, instrumental e estratégica da comunicação organizacional: recorte de um estudo aplicado no segmento corporativo. Intercom: *Revista Brasileira de Ciências da Comunicação*. São Paulo. Vol. 35, Nº 2, pp. 267-289. Internet. Disponível em: <https://doi.org/10.1590/S1809-58442012000200014>
- Eduardo, A. (2005) O papel das agências de comunicação no desenvolvimento da comunicação organizacional: uma análise da eficácia da terceirização da assessoria de imprensa. Internet. <https://docs.google.com/viewer?a=v&pid=sites&srcid=ZGVmYXVsdGRvbWVpbnxtb25vZ3JhZmhmMjAwM3xeDo2M2RmN2MwYWlzMmViNWVm> (retrieved on 20th of September 2020)
- Gonçalves, G. (2013) *Ética das relações públicas*. Coimbra: Edições Minerva.
- Maineiri, T. (2007) O mercado das agências de comunicação organizacional e relações públicas no Brasil e Espanha. Internet. <https://silo.tips/download/o-mercado-das-agencias-de-comunicacao-organizacional-e-relacoes-publicas-no-brasil> (retrieved on 12th of October 2021)
- Marchiori, M. (2011) *Cultura e Comunicação Organizacional: um olhar estratégico sobre as organizações*. 2ª Edição. São Caetano: Difusão Editora.
- Marktest. (2020) 10ª edição do estudo Os Portugueses e as Redes Sociais já disponível. Internet. <https://www.marktest.com/wap/a/n/id~26b4.aspx> (retrieved on 14th of July 2021)
- Sebastião, S., Azevedo, C., Dias, D., & Santos, L. (2012). Faz o que te digo, mas não olhes para o que eu faço: as Consultoras de Relações Públicas e a Comunicação Digital, em Portugal. *OBS Journal*, 6, 259-280.
- Smith, L., & Mounter, P. (2008) *Efctive Internal Communication*. United Kingdom: British Library.
- Smith, P.R. Chaffey, D. (2017) *E-Marketing Excellence: At the Heart of E-Business*. 5ª Edição. Oxford: Butterworth Heinemann.
- Torres, C. (2010) *Guia Prático de Marketing na Internet para Pequenas Empresas*. Internet. http://uab.ifsul.edu.br/tsiad/conteudo/modulo5/gne/biblioteca/claudio_torres_-_mktdigitalpequenaempresa.pdf (retrieved on 20th of January 2023).
- Torres, C. (2018) *A bíblia do marketing digital: tudo o que você queria saber sobre marketing e publicidade na internet e não tinha a quem perguntar*. São Paulo: Novatec Editora.

Facebook moms help! What to buy for Teething? The Impact of Social Proof on Consumer Decisions of Young Mothers

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Abstract: Young mothers often look for solutions to problems related to childcare in groups associating other mothers on Facebook. One can find there not only numerous advice on, among others, nutrition, care or even treatment of infants, but also learn about various consumer trends. The aim of the article is to determine the role of social proof on groups of young mothers on Facebook in making consumer decisions. The research method used was the content analysis on a selected Polish group for young mothers on Facebook. It was hypothesized that social proof on Facebook groups is important in making consumer decisions of young mothers regarding their children. This applies to all products intended for young children, from care products, food products, toys, accessories for children, to medicinal products. Young mothers are often influenced by the prevailing trends and opinions of other members of the group for young mothers, who may be real mothers or – which one may not be aware of – representatives of various brands.

Keywords: social proof, groups on Facebook, consumer decisions, young mothers

1. Introduction

Social proof is a way to influence human behavior. This is where the opportunities and threats for both social media users and brands lie. This is particularly visible in Facebook groups, e.g. those dedicated to young mothers, where product recommendations often dominate among the topics of published posts. This may influence the consumer decisions of young mothers.

The aim of the article is to determine the role of social proof on groups of young mothers on Facebook in making consumer decisions.

The article consists of three parts. The first part is a review of the literature on the role of social proof in making consumer decisions on Facebook groups. The second part presents methodology of research. The last part is about research results.

2. The role of social proof in making consumer decisions on Facebook groups

Social proof is described by Cialdini (2004) as one of the tools of influencing people. It is a psychological phenomenon where people conform to the actions or beliefs of others in order to fit in or to make decisions. Essentially, it means that people tend to trust and follow the behavior of others, especially those they perceive as similar to themselves, in order to make decisions about what to do or believe (Cialdini, 2004; Goethals & Darley, 1977; Miller, 1984). Social proof can take many different forms, such as online reviews, celebrity endorsements, the behavior of people in our social circles and the actions of strangers.

There are many studies showing that social proof also works in the online environment, including social media (Amblee, N., & Bui, T. 2011; Talib, Y. Y. A., & Saat, R. M. 2017; Awotunde, J. B., & Jimoh, R. G. 2019; Naeem, M. 2021; Sanak-Kosmowska, 2021). In these media users are constantly exposed to the opinions and behavior of others. In the context of social media, social proof can manifest in a variety of ways, such as likes, comments, shares, and followers. One of the most common examples of social proof in social media is the use of likes and followers as a metric of popularity and influence. Users often view profiles with a large number of followers or likes as more credible and trustworthy, and are more likely to follow or engage with those profiles as a result. This can create a self-reinforcing cycle, where users with large followings continue to attract more followers and attention, further amplifying their social proof.

Another form of social proof in social media is the use of user-generated content (UGC), such as photos, reviews, and testimonials. When users see others posting positive reviews or sharing their experiences with a product or service, it can influence their own opinions and behavior. Brands often leverage user-generated content as a way to build trust and credibility with their audiences, by showcasing the experiences of real customers and demonstrating the value of their products or services.

Overall, social proof is a powerful tool for building credibility, trust, and influence in social media, and can have a significant impact on user behavior and decision-making. Therefore social media play a key role in businesses

marketing communications. Companies use them to achieve various communication goals, mainly of a long-term nature, such as building customer loyalty and satisfaction, maintaining constant and direct contact with clients, constantly informing them about a change in the offer, creating a positive image of the company or implementing the concept of socially responsible marketing (see Smith, Wollan & Zhou, 2011; Mergel, 2013; Klososky 2011; Thomas & Barlow, 2011). This is because these communication channels are gaining popularity around the world.

In Poland there are 27 million users of social media which is 66.3% of total population. The most used social media platform is Facebook (87.5% of internet users aged 16 to 64 who use platform each month) (Digital Poland 2023). All generations have their representatives on Facebook. This is a great business potential for companies (and other organizations) that increasingly use Facebook in their marketing activities to achieve their goals. These types of actions can be referred to as Facebook marketing. There are many studies on Facebook marketing (Carter et al., 2012; Dunay & Krueger, 2009; Hansson, et al. 2013; Haydon, 2009; Holzner, 2008; Levy, 2010; Ramsaran-Fowdar & Fowdar 2013; Treadaway & Smith, 2012; Zarrella & Zarrella, 2010). One of the marketing tool on Facebook could be groups. They are relatively little explored by researchers (Holzner, 2008; Levy, 2010; Xia, 2009). According to Levy (2010, p. 60-61) "Facebook Group" is "a real-life interest or group or to declare an affiliation or association with people and things", where one can create "a community of people and friends to promote, share and discuss relevant topics" (Ibid). Each Facebook user can set up their own group or groups. This also applies to organizations. Groups can be associated with a fanpage. Their main advantage is that they have relatively large organic reach. One can say that they are in original form of social media, they provoke discussions and content exchange. Therefore they have the potential to boost engagement among users (Lupa-Wójcik 2020).

- Moreover, one can set up three different types of groups on Facebook:
- public (open) groups - anyone can join them and any activity in this group may be visible to outsiders (for example, friends of a group member),
- private (closed) groups - user has to request to join the group and it must be approved by the administrator; activity in this group is not visible to outsiders,
- secret groups - user must be invited into the group and the group is not shown in any searches; activity in this group is not visible to outsiders (Levy, 2010, p. 61).

Groups can be used for various marketing purposes, e.g. they can be dedicated to anyone interested in a given topic, or only for an elite group, e.g. customers or employees (Lupa-Wójcik 2020).

Groups on Facebook usually have their own regulations, defining e.g. rules for publishing posts, rules for marking them (e.g. an order to use certain hashtags), or e.g. rules for communication (e.g. prohibiting the use of invectives). Failure to comply with the regulations may result in the user being thrown out of the group by the administrator. Sometimes post moderation takes place before it is published on the group's page (first the administrator must approve it before it is published) (Ibidem).

Each group has its own specific purpose. On the example of the groups for young mothers:

- groups dedicated to specific issues (e.g. inspiration for moms, breastfeeding group, baby nutrition group, etc.),
- groups of members from specific locations (e.g. bringing together young moms from a given location, city, etc.),
- groups of "advertising column", where everyone can place their own advertisement (for example, "I will give ..." / "I will exchange ..." / "I offer ..." / "I search ...", etc.),
- strictly sales groups - these are groups with additional options, such as: price (marked in green with the possibility of raising and lowering it), name of the sold product, the ability to place its photos, the ability to set the location - the place of receipt, etc.

All these features of Facebook groups make them a very effective marketing tool which can be used in various ways considering social proof. In the context of Facebook groups, social proof can take many forms, including:

- The number of members of a Facebook group - if a group has a large number of members, it can signal to potential members that the group is active and credible;
- The level of engagement within a Facebook group - if a group has a high level of engagement, with lots of comments, likes, and shares, it can indicate that the content and conversations within the group are valuable and interesting;

- Testimonials from existing members - when members share their positive experiences and results from being part of the group, it can encourage others to join and participate;
- Expert validation - when experts or influencers participate in the group, or when the group is affiliated with a reputable organization or brand, it can increase the perceived credibility and influence of the group;
- Recommendations - when members recommend products, services, or resources to others within the group, it can signal that those recommendations are credible and trustworthy.

Overall, social proof can be a powerful tool in making consumer decisions on Facebook groups. Brands can use it for their own purposes or, on the contrary, social proof on Facebook groups can work against them (if, for example, someone in the group warns against buying products of a given brand).

3. Methodology

The aim of the research is to determine the role of social proof on groups of young mothers on Facebook in making consumer decisions.

The following research questions were formulated:

- What categories of posts are published in the studied Facebook groups and what percentage are topics related to product recommendations?
- What reactions (including comments) do individual categories of posts meet, including topics related to product recommendations?
- What kind of products are most often recommended in the studied groups for young mothers?
- What role does social proof play on studied Facebook groups in making consumer decisions by young mothers, including in the area of health?

It has been hypothesized that social proof on Facebook groups is important in making consumer decisions of young mothers regarding their children.

As a research method used was the content analysis on two Polish groups for young mothers on Facebook.

The first group named "Urodziłam w 2021 roku! Największa grupa dla mam" ("I gave birth in 2021! The largest group for moms") was private and at February 13, 2023 it comprised 42.6 thousand. members. The group was founded on April 28, 2020 and had a name until January 2022 "Rodzę w 2021 roku! Największa grupa dla mam" (I am giving birth in 2021! The largest group for moms). Therefore, it gathered future and current mothers who gave birth in 2021. At the time of the study, these children were up to 2 years of age. In January 2023, 2039 posts were published in this group.

The second study group is called "Mama dla Mamy" (Mom for Mom) and it is public. It was established on July 5, 2021 and as of February 13, 2023 it had 59.5 thousand. members. In January 2023, 1,174 posts were published on it.

Both groups are similar in terms of number of members, volume of activity, topics of posts, and age of the group.

In order to achieve the goal of the research, a quantitative and qualitative analysis of 100 random posts published on the mentioned private group and 100 random posts published on the mentioned public group on February 10-15, 2023 was carried out. The randomness of the posts selected for analysis was ensured by selecting the 100 most recently published posts in these groups as of February 10, 2023.

Collected posts from both groups were sorted by the following categories:

- request for a product recommendation - these are posts whose authors directly ask group members to recommend a product or service to them;
- request for advice on a product - these are posts whose authors have a product, but have a problem with its use;
- health advice - these are posts about the health problems of the child or mother; the authors of the posts usually describe specific medical problems and ask for advice;
- advice on the child - these are posts whose authors ask for advice on specific behavior of the child, but also ask for advice of an upbringing nature or problems may relate to the child's development;
- advice on nutrition - these posts deal with problems related to the child's nutrition;

- advice on financial matters - the authors of these posts describe specific problems related to, for example, the household budget, public benefits, as well as housing issues;
- legal advice - authors of this type of posts describe a specific situation and ask for legal advice;
- job offer - these are posts whose authors either ask for a job offer for themselves or offer some work.

The observation sheet analyzed each post quantitatively and qualitatively, noting:

- whether there are product recommendations in the post or in the comments below it (yes or no),
- whether in the post or in the comments below it someone advises against buying products (yes or no),
- what product was recommended in the comments (product category, e.g. drug/supplement, cosmetic, etc.),
- what product was advised against in the comments (product category, e.g. drug/supplement, cosmetic, etc.),
- number of brands reborn in the post or in the comments under the post,
- number of reactions under the post without comments,
- number of comments under the post,
- Was there any criticism/dispute/hate in the comments and if so, what was the reason?
- Observation and analyzes were carried out on February 10-15, 2023.

4. Findings

Based on the analysis of published posts, it should be stated that in both studied groups of young mothers on Facebook (private and public group), topics related to requests for product recommendations and health advice dominate (Figure 1).

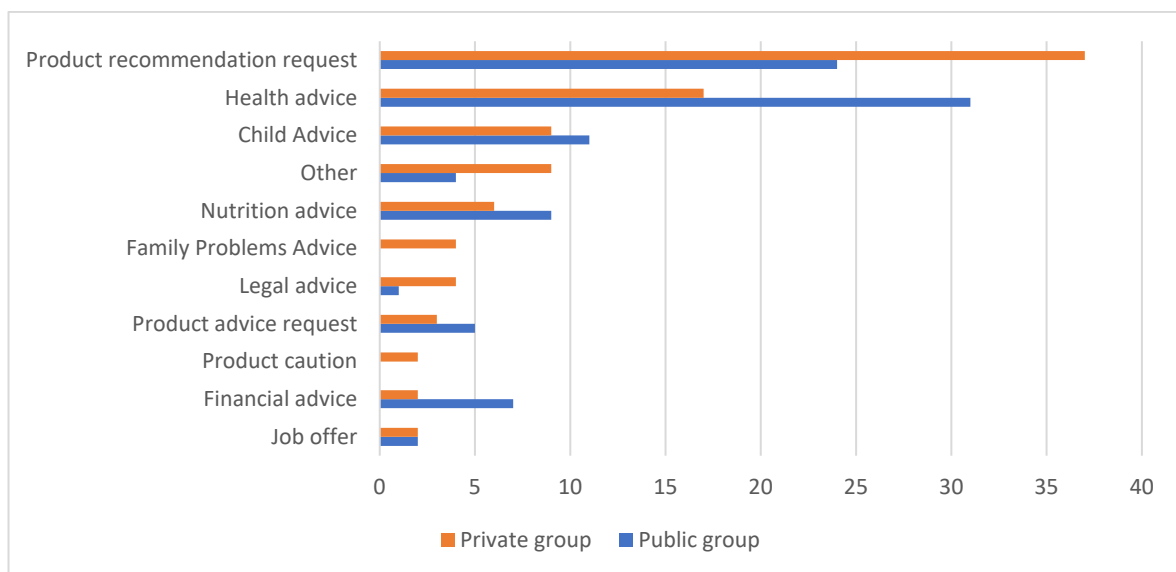


Figure 1. Thematic categories of posts in the studied private and public group (in %)

Source: own.

In the private group, as much as 37% are topics related to product recommendation, and in the public group - 24%. In the latter group, posts related to health problems prevail (31%), while in the private group, such publications account for 17%. Other popular topics in a private group are: advice on a child (behavior or upbringing) - 9%, advice on nutrition - 6%, advice on family matters - 4%, legal advice - 4%, request for advice on product (e.g. how to use it) - 3%, product caution - 2%, financial advice - 2% and job offers - 2%. In turn, in the public group: advice on the child - 11%, child nutrition - 9%, advice on financial matters - 7%, advice on using the product - 5% and job offer - 2%.

It is worth noting that the public group did not observe, for example, a topic related to family problems (i.e. problems with mother-in-law, partner). Perhaps this is due to the fact that these topics are more sensitive and people prefer to remain fully anonymous (although one can post anonymously on public groups).

Groups are definitely dominated by comments as a form of reaction to published posts. Other types of reactions (e.g. likes) are rare, they appear more often in comments. Most often, both in the public and private groups, posts related to product recommendations were commented on (cf. Figure 2 and Figure 3). This is important information, because it means that people who are looking for products to recommend on groups are most likely to find them. This shows the huge role social proof plays in consumer decision making.

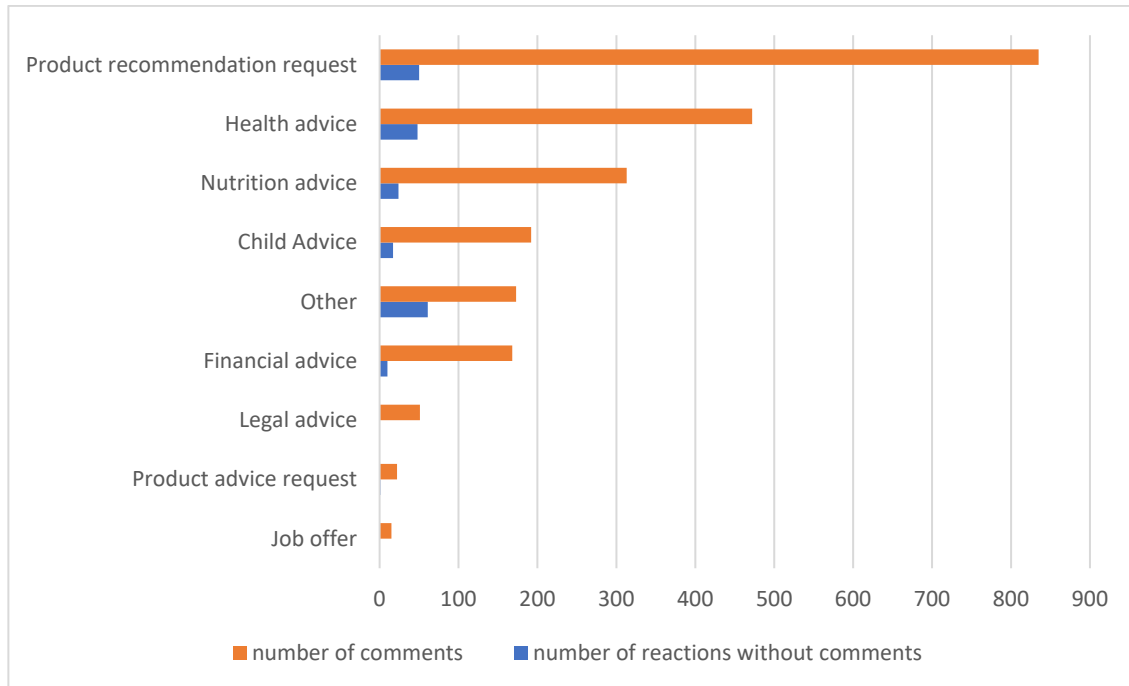


Figure 2. The number of reactions without comments and the number of comments on the public group by thematic category of posts in this group

Source: own.

Posts on other topics (e.g. health advice, nutrition advice, advice on how to behave or raise a child, and others) received much fewer responses (the second most popular topic in terms of the number of comments in both the private and public groups received almost twice as many comments). This data suggests that mothers' groups on Facebook are mainly focused on topics related to product recommendations.

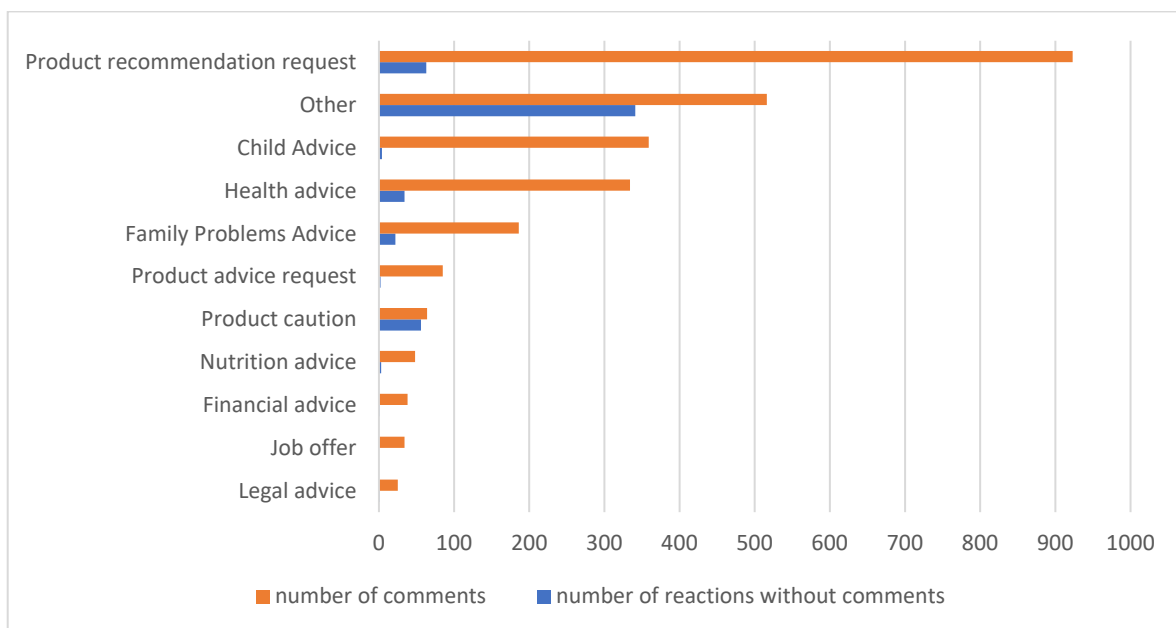


Figure 3. The number of reactions without comments and the number of comments on a private group by thematic category of posts in this group

Source: own.

As mentioned, reactions in the form other than comments are rare and usually concern some very controversial or humorous content. For example, the post with the most reactions in the public group was as follows: *"I would like to start a family. But I am paralyzed by the thought that I will give birth to a sick child. I will bring into the world a man who will suffer, and all because of my selfishness. A mere accident can make a child unhealthy. I can give to little one so much love that I didn't have myself.. I can give my baby so much love that I didn't have myself. I love to surround another life with care, empathy. I would never forgive myself if I gave someone a life of suffering. It's the only thing that stops me from having a baby.. Maybe I will find solution here among women with children who have struggled with similar anxiety."* This post received 41 reactions and 126 comments. The comments under this post were various. Some members of the group recommended a book that could help find the cause of the author's anxiety or suggested psychotherapy. Others referred to ideological issues, which was met with different reactions from the community, including the author of the post. Many people cited many examples from life that were supposed to show that it is worth overcoming own fears. In general, thanks to various advice and presenting different points of view, the author was able to find support in solving her problems.

In the private group, the post with the most reactions had a total of 391 (including 62 comments). It was a humorous meme in the form of a graphic divided into two parts. The first of them showed a clean kitchen with the description *"Whew, I finished cleaning ..."*, and the second with the description *"Meanwhile in the living room ..."* - a toy-messed living room with a child sitting in the center. The meme caused a lot of positive emotions and comments among the recipients of the group, as many mothers identified with it.

As for the qualitative analysis of the post with the highest number of comments, the post on the public group concerned the following query: *"Hello, today I visited the pediatrician with my daughter (she is 10 months old) and she told me that one cannot fry anything in a pan (pancakes, scrambled eggs). That she should eat only cooked vegetables and meat, etc. What do you think about this? I don't know what to give her for breakfast now. She said that even a waffle from a waffle iron cannot be done. I always fry it with a little olive oil."* This publication received 171 comments and 16 reactions. It caused quite a stormy discussion and divided the people speaking into those who shared the opinion of the author of the post and those who supported the doctor's opinion. People representing the first group mentioned that the pediatrician talks nonsense and frying does not harm the child. Many people were of the opinion that one can fry 2-3 days a week, but not every day. In turn, those who shared the doctor's opinion were often criticized for standing up for his opinion. In general, the post did not contain any substantive advice, supported by scientific knowledge. An example comment was as follows: *"Have any children died from fried food? No !! !! so tap your forehead. Let them eat what they like."* A few people referred to content found on the Internet, on YouTube, etc. This example shows that medical knowledge is undermined in groups, which is a huge threat to young mothers who, for example, get their knowledge about child nutrition from social media, and they trust the opinions found there more than the doctors.

In the private group, the largest number of comments was caused by the question: *"How many children do you plan to have?"*. Individual ladies entered how many children they planned, often smiling with the use of emoticons. When someone wrote that they were planning only one child, the author of the post asked about the reason for such a decision. The answers were different - the plans were determined by economic, ideological or other considerations.

It is worth emphasizing that the factor that may discourage young mothers from making entries in the group is the fear of criticism. In general, in the studied private group, it was observed that criticism / dispute appeared in 11% of posts, and in the public group - 2% of posts. This can be explained by the fact that posts in a private group can be seen only by people belonging to this group, and posts posted in a public group can reach friends and family of a given author. Therefore, the status of a public group forces a greater culture of expression and thus hate is present there to a lesser extent.

Social proof on moms' Facebook groups is an important factor in making consumer decisions. As many as 41% of posts or comments in the studied public group and 42% in the private group included a recommendation of products or services (the author of the post did not always ask for it, but such recommendations appeared anyway, which is why the data presented in Figure 1 and Figure 2, these percentages are smaller, as they cover only the topics of the posts). The example of Angelia's post asking for health advice illustrates this situation: *"My*

daughter has such dry patches on her cheek that make her itch and this spreads when scratching to most of the face. What does it look like to you? 🙄🙄". In the comment, the author of the post found a recommendation for a cosmetic for skin changes, although there was no such request in the post itself.

In total, 203 brands were recommended in all analyzed posts of the public group (i.e. an average of 2.03 brands per post), and 250 in the posts of the private group (an average of 2.5 brands per post).

In the public group, drugs or supplements were most often recommended (12%), cosmetics (8%), modified milk (6%), gifts (4%), while in the private group: toys (8%), furniture (5%), services (4%), medicines and supplements (4%), shoes (4%) and strollers (4%), clothes (3%), books (3%), cosmetics (3%) and others (Figure 4).

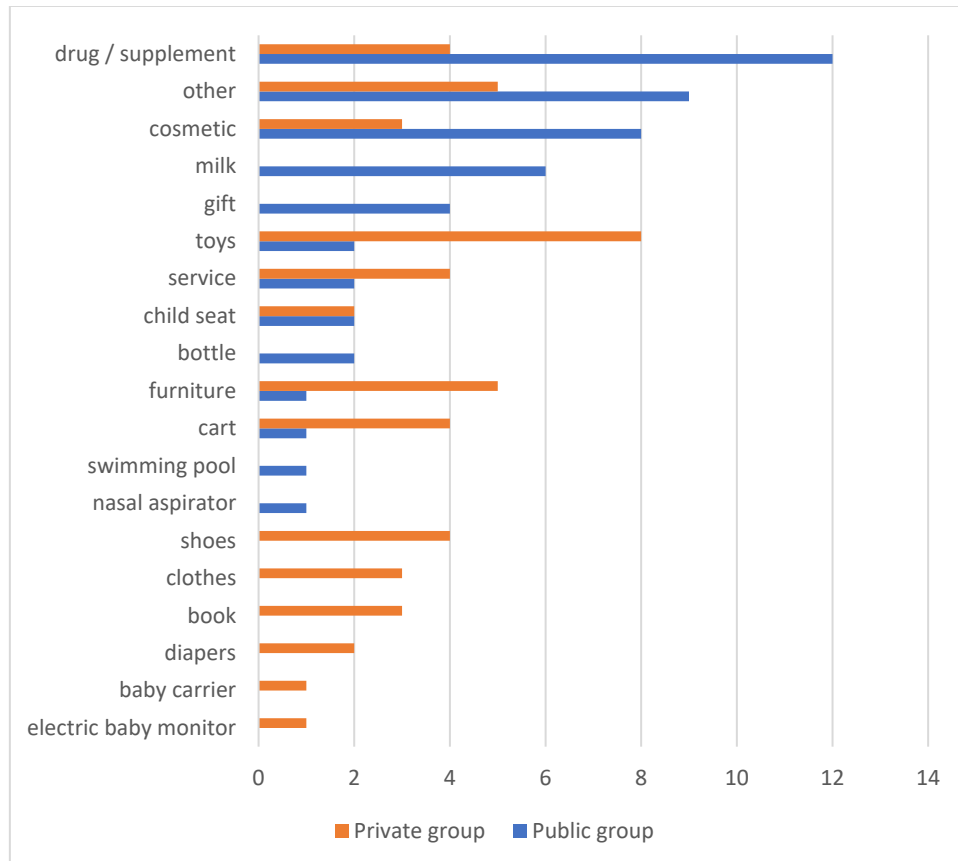


Figure 4. Recommended products in the posts and comments of the studied groups

Source: own.

On a private group, the post of the "product recommendation" category with the highest number of reactions (including comments) (93) read: "Goddaughter's 2nd birthday is coming. What toys/gadgets are such a hit with your 2-year-olds? I have no idea what to give as a gift 🙄". In the comments, the author of the post could find a lot of ideas and inspirations (e.g. a bicycle, sensory books, blocks, puzzles, furniture for a child, etc.). There were also links to direct purchase of a given product. This post directly recommends 43 different brands by name. In this way, mothers who come into contact with brand names can get used to these brands and when they come into contact with them later (e.g. in the form of advertising), they will be more likely to buy products of brands that have been recommended on a Facebook group.

On the public group, the post with the highest number of reactions (193) was: "Tell me what you can get for PLN 200 except perfume, underwear???". The author could also count on many unconventional ideas on how to please herself. Ladies in the comments shared their inspirations, pointed out specific products and brands, and often sent direct links to purchases.

It is worth noting that the posts also often contain, for example, information about special occasions (promotions), such as Ewelina's post: "I kindly inform you about the promotion in Rossmann 🙄" with a photo of diapers discounted by 25%. It should be added that on groups, mothers often exchange e.g. discount codes or their loyalty cards.

In the studied groups, there were situations where someone advised against buying or using a product of a specific brand or even warned against it (this applies to 9% of public group posts and 9% of private group posts who advised against the product). It concerned such products as: medicines and supplements (3%), bottles (2%), toys (2%), car seat (2%), cosmetics (1%), modified milk (1%), strollers (1%), clothes (1%), services (1%), and others (Table 1).

Table 1. Products not recommended on the tested groups

Product not recommended	Public group	Private group
cosmetic	1	0
milk	1	0
bottle	2	0
drug / supplement	3	0
cart	0	1
clothes	0	1
service	0	1
toy	0	2
other	2	2
car seat	0	2
sum	9	9

Source: own.

For example, a post by Daria was published in a public group, asking for a recommendation of a cosmetic or medicine for irritated skin. In the comments, mothers advised against using some products, such as "Sudokrem" cream (some ladies praised it, others pointed out that it had the wrong composition), or the skin powder found both supporters and opponents.

Similarly, Iwona posted a post on a private group asking for a recommendation of sleepers for a child. She asked about a specific brand - Sinsay - if anyone recommended it. In the comments, some ladies said that they buy only products of this brand, and others advised against it because of the quality and suggested a different brand. Ultimately, the author of the post, based on the opinions presented, decided to buy a product of another brand (Smyk).

On these groups, one can also find posts by mothers who directly warn against buying certain products of a given brand. For example, Marzena published a post with a photo of a fruit mousse from the brand "Owolovo", which had mold, even though its expiration date was good. There were 118 reactions under the post, including 60 comments. Most mothers were surprised to find mold in such products. Some said that they feel remorse for buying ready-made mousses for their children, which may be poisonous. Now they prefer to prepare their own fruit mousses. Others said they test these mousses before giving them to their baby. In general, most mothers spoke negatively about this type of product (this and other brands) and declared that they would not buy it for their child again.

5. Conclusion

Considering Cialdini's principle that social proof works especially when other people are similar to us, it seems that the impact of product recommendations on Facebook groups of young mothers is particularly strong. This is confirmed by the research carried out for the purposes of this article.

Quantitative and qualitative data show that posts asking for product recommendations or health advice are most often published on the studied groups. These two categories of posts definitely dominate in the quantitative analysis of posts published by mothers in the groups. Topics related to product recommendations account for as much as 37% of all topics published in the studied private group and 24% in the public group. However, it should be emphasized that product recommendations appear in the comments of over 40% of posts published in both groups (e.g. if someone has a health problem, product recommendations appear under the post, which - according to group members - are supposed to help).

Posts related to product recommendations generate the largest number of reactions, mainly in the form of comments. This is important information, because it means that people who are looking for products to recommend on groups are most likely to find them. This shows the huge role social proof plays in consumer decision making. In the studied groups, drugs and supplements, cosmetics, milk, toys, services, furniture, prams and other such products are most often recommended for young mothers.

Based on the quantitative and qualitative analysis, it should be stated that social proof on Facebook groups is an important factor in consumer decision-making. The names of certain brands are repeated under given product categories, which means that group members have frequent contact with them and, according to the mere exposure effect phenomenon (see Zajonc 1968), they start to like them. This results in the fact that, for example, facing the choice of buying products of different brands on store shelves, they will prefer products of brands with which they had contact in these groups. However, there are posts in which someone warned against products of given brands (e.g. the product was defective). This, in turn, had a discouraging effect on group members, who declared that they would rather not buy a given product. Of course, it happened that during the observation, marketing activities of specific brands were recorded (sales offers were presented), but this was not a frequent phenomenon, because the surveyed groups are not of a sales nature (there is a ban in the regulations of these groups to publish sales content). There were probably activities in the area of word-of-mouth marketing, which, however, if properly practiced, is difficult to detect (e.g. employees of given brands can set up fictitious but reliable private accounts (i.e. accounts that, for example, have friends) and discreetly offer products to their brands). However, this should be done in a careful and authentic way, because regular members of a given group can quickly pick up on such activities.

Summing up, the hypothesis that social proof on Facebook groups is important in making consumer decisions of young mothers regarding their children was confirmed. The aim of the research has been achieved. However, the problem raised in this article is so important and complex that further research in this field is necessary.

6. Implications and limitations of the study

The obtained research results may have an important message for young mothers who use Facebook groups. It is possible to indicate many opportunities and threats for them. Opportunities include:

- the ability to stay up to date with consumer trends,
- support in problems related to motherhood (the group brings together people who are in a similar life situation),
- the possibility of obtaining many solutions to a given problem, the possibility of seeing the problem from many different perspectives.

However, young mothers should remember about many risks, including:

- undermining specialist/scientific knowledge by members of the group,
- diagnosing health problems by people who do not have the knowledge, experience and education to make diagnoses, especially on the basis of short entries,
- spreading false information or information based on unreliable sources,
- publishing photos of children, sometimes very intimate (e.g. half-naked bodies to show other members of the group a rash on the body for diagnosis),
- hating, which can lead to a depressed mood and even depression.

From the point of view of brands, both opportunities and threats can be identified. Social proof on groups for young mothers can be an opportunity if a given brand is recommended by group members, it appears relatively often in discussions with positive sentiment. However, social proof can also be a threat if the sentiment is negative. Posts that warn against products of a given brand are especially dangerous. By the way, such posts could be published by competitors to unethically harm a given brand. It is worth for the employees of these brands to be present at such groups in order to monitor the situation (in the case of public groups, they may use automated monitoring tools). They can conduct word-of-mouth marketing, but in a credible and authentic way. This will only be possible if employees of a given brand are willing to genuinely help group members in solving their problems.

The author is aware of some limitations resulting from the conducted research. The number of posts analyzed is not large due to the qualitative research of these posts. However, the author's observations showed that an increase in the number of posts would not affect the results of the study and conclusions.

References

- Amblee, N., and Bui, T. (2011) Harnessing the influence of social proof in online shopping: The effect of electronic word of mouth on sales of digital microproducts. *International journal of electronic commerce*, 16(2), 91-114.
- Awotunde, J. B., and Jimoh, R. G. (2019) A Model for Identifying Influential Bloggers using Social Proof, Mining Comment, and Emerging Topics in Social Media. *Computing & Information Systems*, 23(1).
- Carter, B., Levy, J., and Levy, J. R. (2012) Facebook marketing: Leveraging Facebook's features for your marketing campaigns. Que Publishing.
- Cialdini, R. (2004) Wywieranie wpływu na ludzi. Teoria i praktyka, GWP, Gdańsk.
- Dunay, P., and Krueger, R. (2009) Facebook marketing for dummies. John Wiley & Sons.
- Goethals, G. R., and Darley, J. M. (1977) Social comparison theory: An attributional approach. In J. M. Suls & R. L. Miller (Eds.), *Social comparison processes: Theoretical and empirical perspectives*. Washington, DC: Hemisphere/Halsted.
- Hansson, L., Wrangmo, A., and Solberg Sjølen, K. (2013) Optimal ways for companies to use Facebook as a marketing channel. *Journal of Information, Communication and Ethics in Society*, 11(2), 112-126.
- Digital Poland (2023), We Are Social, <https://datareportal.com/reports/digital-2023-poland>.
- Haydon, J., Dunay, P., and Krueger, R. (2012) Facebook marketing for dummies, New Jersey: John Wiley & Sons.
- Holzner, S. (2008) Facebook marketing: leverage social media to grow your business. Pearson Education.
- Internet 2017/2018 (2018). Raport Strategiczny, Warszawa: IAB Polska.
- Klososky, S. (2011) Enterprise social technology, Texas, Austin: Greenleaf Book Group LLC.
- Levy, J. (2010) Facebook marketing: Designing your next marketing campaign. Pearson Education.
- Lupa-Wójcik, I. (2020) Groups on Facebook as a Marketing Tool, *Marketing of Scientific and Research Organizations* 37(3):17-32.
- Mergel, I. (2013) Social media in the public sector, New Jersey: John Wiley&Sons, Inc.
- Miller, J. (1984) Culture and the development of everyday social explanation. *Journal of Personality and Social Psychology*, 46, 961-978.
- Naeem, M. (2021) The role of social media to generate social proof as engaged society for stockpiling behaviour of customers during Covid-19 pandemic. *Qualitative Market Research: An International Journal*, 24(3), 281-301.
- Ramsaran-Fowdar, R. R., and Fowdar, S. (2013) The implications of Facebook marketing for organizations. *Contemporary Management Research*, 9(1).
- Sanak-Kosmowska, K. (2021) Evaluating Social Media Marketing: Social Proof and Online Buyer Behaviour. Routledge.
- Smith N., Wollan R. and Zhou, C. (2011) Social media management handbook, New Jersey: John Wiley&Sons, Inc.
- Stelzner, M.A., (2019) How Marketers Are Using Social Media to Grow Their Businesses, Social Media Marketing Industry Report.
- Talib, Y. Y. A., and Saat, R. M. (2017) Social proof in social media shopping: An experimental design research. In *SHS Web of Conferences* (Vol. 34, p. 02005). EDP Sciences.
- Thomas, D.B., Barlow, M. (2011) Enterprise Social Media Strategy. How Social Networks Are Radically Transforming Your Business, New York: Wiley.
- Treadaway, C., and Smith, M. (2012) Facebook marketing: An hour a day. John Wiley & Sons.
- Xia, Z. D. (2009). Marketing library services through Facebook groups. *Library management*, 30(6/7), 469-478.
- What's shaping the digital ad market (2019) <https://www.emarketer.com/content/global-digital-ad-spending-2019>.
- Zajonc, R. (1968), Attitudinal effects of mere exposure. „*Journal of Personality and Social Psychology*”. 9, part 2.
- Zarrella, D., and Zarrella, A. (2010) The Facebook marketing book. " O'Reilly Media, Inc."

Modelling Responsible Digital Security Behaviour for Countering Social Media Manipulation

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Abstract: While the digital environment, and in particular social media, surrounds not only human's identity and its societal functions projection, e.g., institutional and financial aspects, it also captures both individual and collective thoughts regarding former, ongoing, and future concepts, trends, and incidents placed in the physical world, in the digital environment, or in both which could impact both individual and collective consciousness, behaviour, and attitude towards different dimensions of reality. Accordingly, an initial attempt to define and model responsible digital security behaviour was made and ongoing discourses and AI-based solutions for tackling and containing social manipulation mechanisms exist in this domain. Noteworthy is that dedicated attention to understanding and modelling responsible digital security behaviour in social media for tackling and/or countering social media manipulation, e.g., disinformation and misinformation, still lacks. To this end, this research aims (i) to capture the factors influencing user behaviour towards tackling and/or countering social media manipulation, (ii) to build a Machine Learning model that assesses user's responsibility in relation to tackling and/or countering social media manipulation mechanisms, and (iii) propose a set of socio-technical recommendations for building resilience to such mechanisms. To accomplish these research objectives, a Design Science Research methodological approach is taken by designing, developing, and evaluating the model proposed through exemplification. Finally, this research aims to enhance digital security awareness and resilience to social media manipulation of users and policy decision-makers to manage and further extend in a responsible and safe way the digital environment.

Keywords: information operations, cyber operations, cyber security, digital security, responsible security, digital security behaviour, Bayesian networks.

1. Introduction

With each day more people and organizations are projecting their identity, vision, and (diverse dimensions of) their existence in the social media realm. On the one hand, this further facilitates the grow of information together with exchange and communication among different users, communities, and societies (Cinelli et al. 2019). On the other hand, focusing on the scale and intensity of its impact, the information communicated and exchanged can be either real or false through intentional alteration and manufacturing or unintentional through, e.g., mistake. This could lead to implications and consequences like discreditation, confusion, behaviour change and negatively influencing decision-making processes, time, and resources allocated during crisis, and alter public perception in social, political, economic, and health settings (Bontcheva et al. 2020; Chockalingam & Maathuis, 2022). Such social manipulation campaigns are the ones conducted for addressing and influencing people's perspectives on historical and political aspects like in the wars in Syria and Ukraine by specialized cyber troops (Filton, 2016; Bradshaw & Howard, 2018; Pavlik, 2022), on climate change issues (Mavrodieva et al. 2019), and on symptom, vaccine composition, and vaccination impact during the Covid-19 pandemic and Infodemic (Li et al. 2022). While such issues are continued to be addressed by researcher and practitioner communities together with dedicated social platforms, organizations, and governments through dedicated solutions like campaigns, alerts, fact checking, and filtering algorithms, it all comes down to the level of user behaviour. The user must be aware and proactively address social manipulation by building resilience and further effectively tackling and/or countering it. This represents an important knowledge gap that this research intends to tackle which may lead to a new research path in this direction. Accordingly, this research aims to (i) gather and cluster influential factors that correspond to the responsible digital security behaviour in social media, and (ii) develop an AI-based model for assessing such behaviour. Hence, the following research questions are defined:

- What are the influential factors representing the responsible digital security behaviour when tackling and/or countering social media manipulation?
- How to develop an AI assessment model that classifies the responsible digital security behaviour in social media as being responsible or not?

Hence, while through the first research question features of the responsible digital security behaviour are captured, they are further used in the second research question to build an AI-model that assesses this behaviour. To tackle these questions, a Design Science Research methodological approach is considered based

on a literature review conducted in the digital/cyber security, social media manipulation, psychology, behaviour and cognitive science, and AI domains. Hence, the contributions of this research can be summarized as follows:

- Identifies and categorizes the factors contributing to building a responsible digital security behaviour in combating social media manipulation.
- Addresses the need for building an AI model for producing and enhancing awareness and resilience to social media manipulation.

The remainder of this article is structured as follows. Section 2 settles the context while discussing relevant scientific studies and governmental strategies and policies. Section 3 highlights the research methodology used for achieving the aim of this research. Section 4 presents the working definition of this research and prepares the terrain for Section 5 where influencing factors are gathered and clustered into three different categories. Section 6 discusses the developed model and evaluation through demonstration. Conclusively, Section 7 summarizes the findings of this research and presents future research ideas.

2. Social Media Manipulation Related Research

Taking into consideration the complex nature and the multi-faceted aspects of this research, multidisciplinary research is conducted capturing relevant characteristics from the digital/cyber security, social media manipulation, psychology, behaviour and cognitive science, and AI domains. Furthermore, this research is positioned in the existing body of knowledge.

The first step in assessing and further building user and/or social platform capacity for countering social media manipulation is awareness. Accordingly, Ki-Aries & Faily (2017) identify human factors for building persona-centered information security awareness stressing that such a perspective allows building a security capacity (skills) adaptive in time for generating a positive contribution when avoiding, containing, or reducing risks and corresponding malicious incidents. Next to awareness, behavioural change to existing or possible future risks is necessary. On this, Perski et al. (2017) conduct a systematic review on digital behaviour change and engagement. They point out among others, the importance of psychological influencing factors like experience, motivation, and self-efficacy. Bada et al. (2019) stress the need for including human factors, and particularly, psychological factors when building cyber security awareness campaigns and solutions. Moreover, Mashiane & Kritzinger (2018) propose a conceptual taxonomy for cyber security behaviour to categorize it including security awareness and possible naïve mistakes that users could make. Kamarulzaman, Shuhidan & Wahid (2022) propose a framework for capturing the effect of information security behaviour on the relation between digital literacy and information security culture including factors, e.g., critical thinking and problems solving, which are relevant to this research.

Going further into the social media realm, Ansar & Goswami (2021) conduct a survey on characteristics and detection methods applied to fake news and consider that their spread is done either through malicious accounts or through echo chambers. Such detection mechanisms rely on evaluating the content, source, and social response to it. Particularly, Caled & Silva (2022) conceptualize social media manipulation mechanisms such as disinformation and misinformation, further reflecting on cognitive vulnerabilities like bias that influence human behaviour and address the necessity of developing solutions based on multidisciplinary research. Traberg, Roozenbeek & van der Linden (2022) bring back attention to an old socio-psychological theory, i.e., the inoculation theory, for immunizing governments and social media companies by pre-exposing them with different social manipulation doses. It means building relevant scenarios from where they can learn how to recognize and combat social media manipulation. Regarding social media manipulation, Pennycook & Rand (2021) investigate the reasons why people believe and further share false or highly misleading information/news online. They emphasize that people are better judging truth from falsehood when evaluating political concordant news, while poor judgement is related to their lack of careful reasoning and when using heuristics like familiarity. At the same time, they also acknowledge that there is a substantial disconnection between what people believe and what they share in social media due to inattention, e.g., not properly checking the source of information. Effron & Helgason (2022) discuss three psychological factors that contribute to countering social media manipulation: partisanship, imagination, and repetition, and directly relate them to current social constructs, i.e., political polarization, alternative facts being pushed by leaders, and technology that amplifies social media manipulation. Furthermore, Reisach (2021) assesses the responsibility that social media platforms have in regards with countering disinformation and societal polarization. They also scrutinize that social media platforms have the capacity to minimize societal risks by taking responsible action in corresponding societal

domains, i.e., human rights, education, and transparency of algorithmic decisions. The role of social media platforms on countering manipulation mechanisms like disinformation is analyzed by Horowitz et al. (2022). Herein, the authors stress the importance and responsibility that social platforms have for producing fact-based content and building intelligent anti-disinformation solutions. Specifically on social media content, Schreiner, M., Fischer, T., & Riedl (2021) identify its role and relevant characteristics together with its relation to user's emotions and corresponding emotional responses. Moreover, Moran, Muzellec & Johnson (2019) analyze user engagement in social media and under this umbrella they capture in a conceptual model the following actions taken on content: clicks, links, comments, and shares. At the same time, several AI-based solutions continue to be developed and proposed in different settings as discussed in the comprehensive review conducted on deep learning detection solutions by (Mridha et al. 2021). To this end, Maathuis & Chockalingam (2022a) proposed a definition and an AI-based assessment model for responsible digital security behaviour which clusters the influential factors on such behaviour as human, infrastructure, and policy-based. The concept introduced, and the implemented model represent the basis of this research on top of which different discussed studies contribute to.

At a governance level, ITU (International Telecommunication Union) released a report on countering digital disinformation while the freedom of expression is respected by analyzing different international disinformation responding mechanisms together with the impact on the right of freedom of opinion and expression, touching as well corresponding concepts like online privacy and dignity issues Bontcheva et al. (2020). The European Commission tackles disinformation and misinformation through different policies, strategies, and programs for protecting values and democratic systems, e.g., the Strengthened Code of Practice on Disinformation, the Action plan on disinformation, and the European Democracy Action Plan were developed (EC, 2022). NATO continues to maintain its readiness to actively deal with disinformation and misinformation campaigns and operations "in a unified manner". This is done through fact-based, credible public communications, debunking false narratives, and further sharing proper and transparent "information, insight, and best practice" (NATO, 2020). At the same time, to mention some efforts of social media platforms, e.g., the identification and removal of accounts conducting inauthentic engagement on Facebook, Instagram, TikTok, and YouTube platforms. However, further efforts on transparency, accountability, and actively countering social manipulation are necessary (Bay et al. 2020). These efforts reflect the existing necessity of understanding and strengthening user's behaviour by building corresponding social media manipulation combating mechanisms and solutions.

3. Research Methodology

To capture and cluster the influential factors that contribute to developing responsible digital security behaviour for countering social media manipulation, a multidisciplinary stance is adopted. Taking into consideration the fact that the aim of this research reasons with a deep societal need and its underlying technicality, this research follows the Design Science Research methodology (Peffer et al. 2007; Peffer, Tuunanen & Niehaves, 2018). In terms of the model development, we adapt and extend the Responsible Digital Security Behaviour model proposed by Maathuis & Chockalingam (2022a) to combat social media manipulation. Consequently, the model proposed represents to the best of our knowledge the first modelling effort in this direction while stressing the necessity of further building explainable and responsible AI-based models for tackling societal challenges (Maathuis, 2022a; Maathuis, 2022b). Consequently, the following research activities are taken:

Problem Identification and Solution Objective: In recent years, the number, complexity, scale, and impact of social media manipulation has significantly increased reaching from precisely smaller target audiences to broader dynamic and imprecise (target) audiences reflecting direct social and technological engagement advancements (Maathuis, Pieters & van den Berg, 2018b). In this area, next to stakeholders like social media platforms, dedicated organizations, and governments, users must be digitally aware and responsible for properly preventing and countering social media manipulations mechanisms. Accordingly, through a literature review in the domains involved conducted on scientific databases like IEEE, ACM, and Springer using combinations of keywords like 'social manipulation', 'disinformation', 'misinformation', 'digital awareness', 'security behaviour', and 'AI', this research aims to capture influential factors for developing a model for representing digital security behaviour in social media for combating social media manipulation.

Design and Development: The factors are identified and clustered, and a Bayesian Belief Network model is designed and developed in this research considering the model introduced by Maathuis & Chockalingam (2022a). That model considers three clusters of factors, namely *human*, *infrastructure* and *policy* while tackling general digital security aspects. In the model introduced in this research, all categories of factors are extended while new ones particular to the social media domain are added. Specifically, the only common cluster between

the initial model and the one proposed in this research is the *human factors* model, but the one proposed here add other factors like *Social_influence* and *Cognitive_bias*, while the other two clusters are different: *infrastructure* and *policy clusters* from the initial model are replaced with *content* and *social media clusters* in the model proposed in this article. The choice for building the model proposed in this research using BBN is their nature and capability of representing knowledge characterizing a domain or a problem, representing probabilistic relationships between characterizing variables (factors in our case), reasoning about uncertain information and aspects, i.e., social media activities, and predictive modelling, i.e., being able to predict in which situation one's behaviour could be considered digitally responsible in social media. To add to these benefits of building BBN models are their easy of use in different decision-making processes, their explainability power since they are easy to understand and interpret, and their transparency characteristic since they support verification and validation using different types of data and scenarios generated by both real incidents and experts.

Demonstration and Evaluation: The model proposed is demonstrated and evaluated through demonstration on two different instantiations that capture two different user settings, i.e., the first one which reflects a responsible behaviour versus the second one which reflects an irresponsible behaviour towards countering social media manipulation.

Communication: The factors, model, and results obtained are disseminated through this article and corresponding presentations.

4. Responsible Digital Security Behaviour Countering Social Media Manipulation

Grounded on disintermediation and technological advancements, efforts built for influencing, disturbing, or damaging decision-making processes, opinion, belief, and/or behaviour of a target audience imply either a singular or a combination of more strategies and mechanisms like disinformation and misinformation (Cinelli et al. 2019). Such mechanisms should be flexible and tailorable and are labelled in the context of social media as social media manipulation. A few such examples are generating confusion, tensions, and conflict among the components of target society, and discrediting, destabilizing, undermining, or promoting specific (sub)groups of target society (Mazarr et al. 2019). Since social media manipulation increased in scale, volume, and distribution speed (Kapantai et al. 2021), both increased conventional media exploitation and exposure is created and given to, respectively (Fitzpatrick, 2018; Bada et al. 2019). However, confusion about the meaning of specific social media manipulation mechanisms like disinformation and misinformation still exists. Concretely, these mechanisms are macro-concepts as they include specific techniques like deep fakes, fake news, and rumors. Accordingly, disinformation refers to the intentional use of altered or fabricated information while misinformation implies the use of misleading or inaccurate information in an unintentional way (Caled & Silva, 2022; Guess & Lyons, 2020; Petratos, 2021). To tackle these mechanisms, apart from the detection and countering solutions developed by researchers plus social media platforms and organizations, awareness, and resilience of global users through instruments like inoculation theory and prebunking for pre-emptively building cognitive, social, psychological, and emotional resistance to such threats, are necessary (Traberg, Roozenbeek & van der Lindern, 2022; Fard & Maathuis, 2021). Such instruments call for enhancing existing or building new digital security behaviour in a responsible way in relation to tackling and/or countering social manipulation mechanisms. To this end, this research extends the definition for responsible digital security behaviour which points to how the agent acts in relation to a digital system in a given (digital) context respecting agreed norms, procedures, and values of agent's organization Maathuis & Chockalingam (2022a). This implies that when referring to responsibility we mean in this research the combination of ethical, legal, and social norms and values that both organizations and agents have. Hence, the working definition for responsible digital security behaviour in social media is considered:

Responsible Digital Security Behaviour in relation to tackling and/or countering social media manipulation is the way an agent (e.g., user) acts in relation to a social media component (e.g., content, other accounts, policy) in each (digital) context with respect to the agreed norms, procedures, and values of the social media platform.

5. Clustering Influencing Factors

The previous section introduced the working definition of this research. Furthermore, factors that influence it are captured and clustered considering human, content, and social media dimensions together with the interaction design as well as goal, role-based persona design, and content aspects and model introduced by (Nielsen, 2015; Wu et al. 2019; Maathuis & Chockalingam, 2022a) and captured in Table 1 and further explained:

- Input variables: human factors which include user related aspects, content factors which contain relevant content characteristics, and social media factors which include tackling and/or countering mechanisms in a socio-technical perspective.
- Output variable (target): Influence which can be responsible or irresponsible.

Table 1. Influential factors

Human Factors (Perski et al., 2017; Ki-Aries & Faily, 2017; Mashiane & Kritzing 2018, 2018; Chowdhury, Adam & Skinner, 2019; Bontcheva et al., 2020; Pennycook & Rand, 2021; Effron & Helgason, 2022; Kamarulzaman, Shuhidan & Wahid, 2022; Caled & Silva, 2022)	• Experience (High, Medium, Low) • Critical thinking and problem solving skills (High, Medium, Low) • Belief and motivation (High, Medium, Low) • Security awareness (True, False) • (Naïve) mistakes (True, False) • Self-efficacy/Response efficacy (High, Medium, Low) • Time/space pressure (True, False) • Social influence/Peer behaviour (High, Medium, Low) • Emotional conditions (True, False) • Cognitive bias (High, Medium, Low) • Morality (High, Medium, Low)
Content Factors (Wu et al., 2019; Moran, Muzellec & Johnson, 2019; Reisach, 2021; Ansar & Goswami, 2021; Schreiner, Fischer & Riedl, 2021; Traberg, Roozenbeek & van der Linden 2022; Horowitz et al., 2022)	• Source check (True, False) • Information evaluation (True, False) • Content engagement/Social response (High, Medium, Low)
Social Platform Factors (Reisach, 2021; Effron & Helgason, 2022; Horowitz et al., 2022; Caled & Silva, 2022)	• Policy application/action (True, False) • Risk perception in relation to sharing/content amplification (High, Medium, Low) • Countering/Combating mechanism effectiveness (High, Medium, Low) • Countering/Combating mechanism management (High, Medium, Low)

6. Model Design and Evaluation

Once the factors were identified and clustered, the modelling process starts by first briefly discussing the AI technique used, i.e., Bayesian Belief Networks. This represents a powerful formalism for automated reasoning with uncertainty incorporating probabilistic information and facilitating decision making processes in a diverse plethora of domains and applications (van der Gaag, 1996). This technique is used for building the model proposed in this research as it allows the incorporation of both qualitative and quantitative approaches in a complex and uncertain environment like social media. Accordingly, the qualitative component is a Directed Acyclic Graph which contains variables and relations/edges between them, and the quantitative component relates to the CPT (Conditional Probability Tables) which captures conditional probabilities for all child-parent variables states (Marcot & Penman, 2019), as depicted in Figure 1. As this research predicts the influence of factors identified, then it embeds a predictive reasoning approach, i.e., reasoning from cause (upper layer) to effect (lower layer).

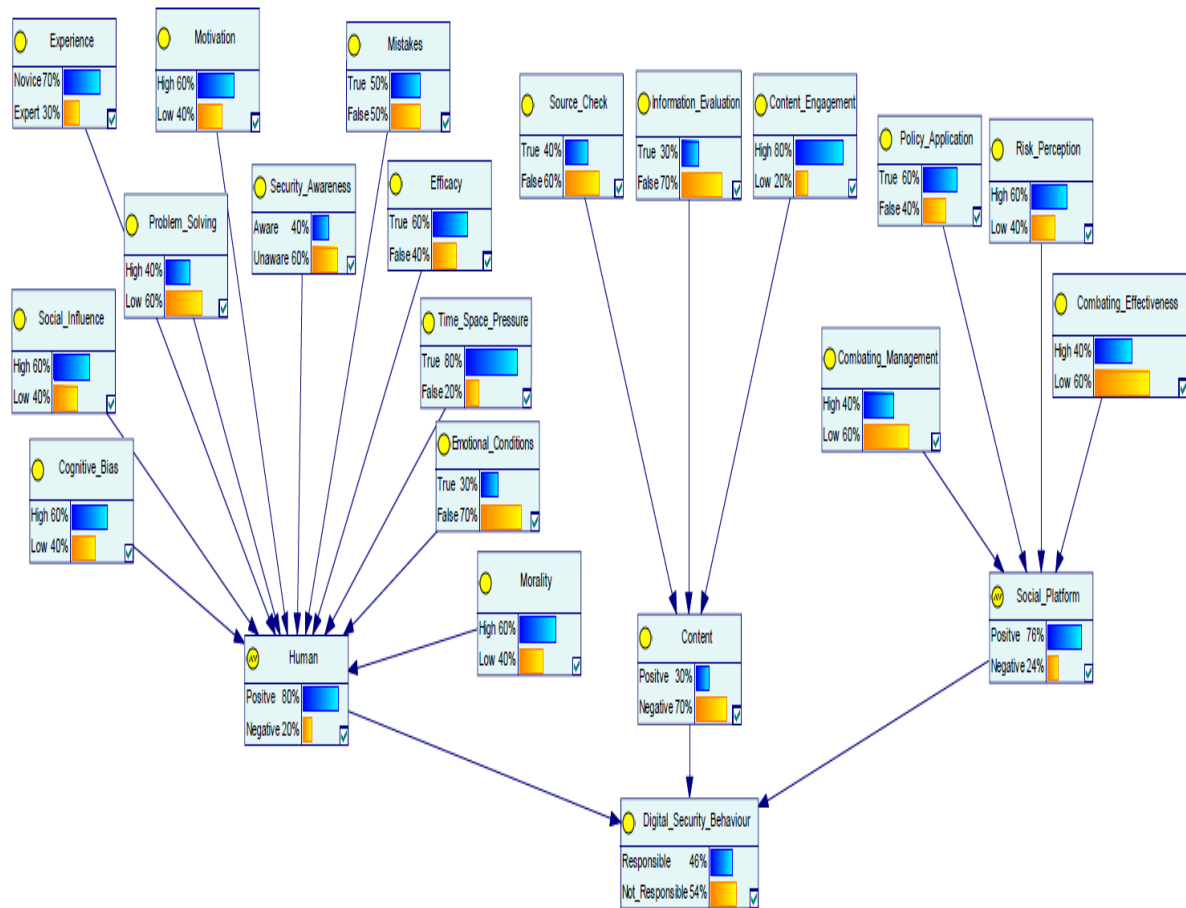


Figure 1. Proposed model without evidence provided.

In this model example values are used to demonstrate its functional mechanism while further evidence is provided on concrete cases of responsible versus irresponsible behaviour captured in Figure 2 and Figure 3.

In the first case shown in Figure 2, evidence is set in the upper layer as follows: Experience = ‘Low’, Security awareness = ‘False’, Emotional conditions = ‘True’, Cognitive bias = ‘High’, Information evaluation = ‘False’, and Risk perception = ‘Medium’. Hence, the posterior probability (57%) is computed for the Influence target variable to ‘Not_responsible’. This implies that the user shows an irresponsible digital security behaviour in relation to combating social media manipulation as it can be influenced by emotional narratives, staged videos, and polluted data (Bontcheva et al. (2020). Consequently, the user should be trained either based on individual initiative or through a collective initiative taken by social media, dedicated organizations, and governments, to be aware, alert, and effective in such situations considering a diverse plethora of possible situations in different manipulation contexts and settings (Horowitz et al. 2022), e.g., concrete, and transparent incident analysis and implications based on the dynamics involved in the ongoing war in Ukraine.

In the second case depicted in Figure 3, evidence is set in such a way: Experience = ‘High’, Critical thinking = ‘High’, Self-efficacy = ‘High’, Cognitive bias = ‘Low’, Information evaluation = ‘True’, and Risk perception = ‘High’. Hence, the posterior probability (53%) is computed for the Influence target variable to ‘Responsible’. This implies that the user shows a responsible digital security behaviour in relation to combating social media manipulation mechanisms since is difficult to be manipulated. Accordingly, the user should remain further alert and effective while remaining open to media governance initiatives like policies and advises to further maintain and further strengthen this behaviour (Reisach, 2021).

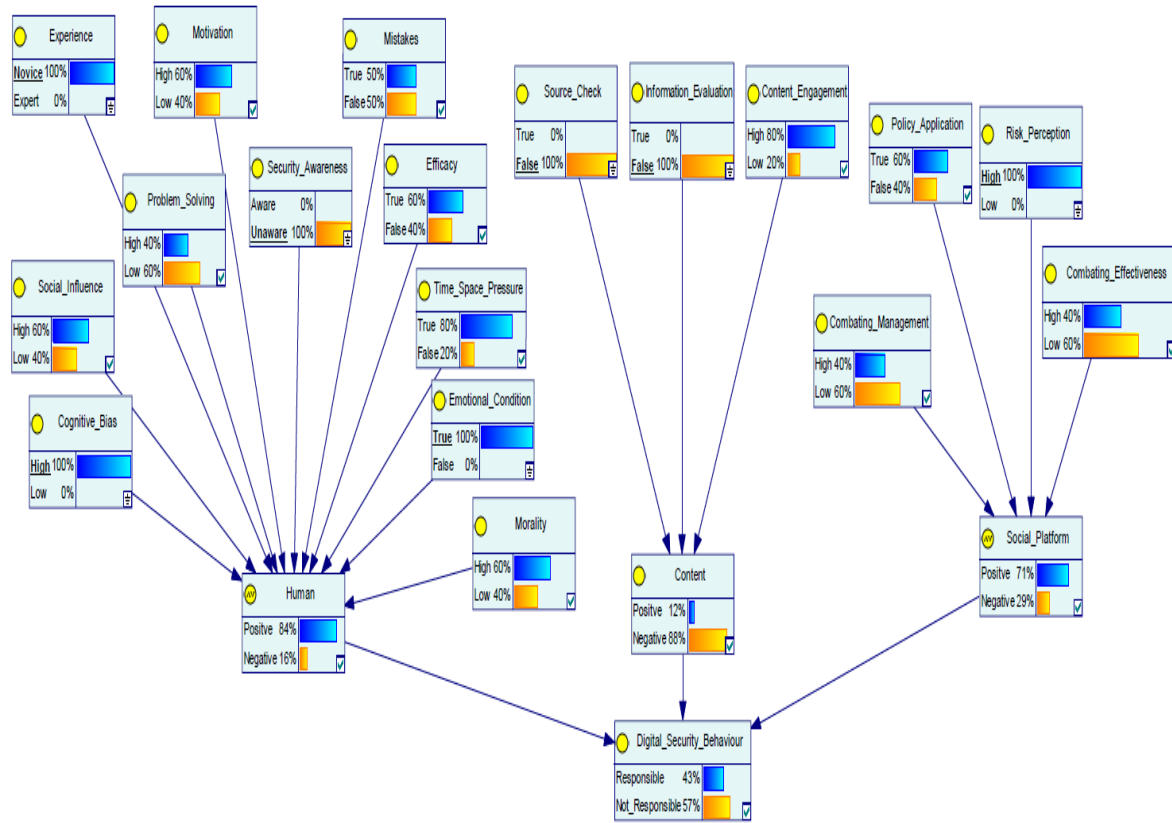


Figure 2. First demonstration

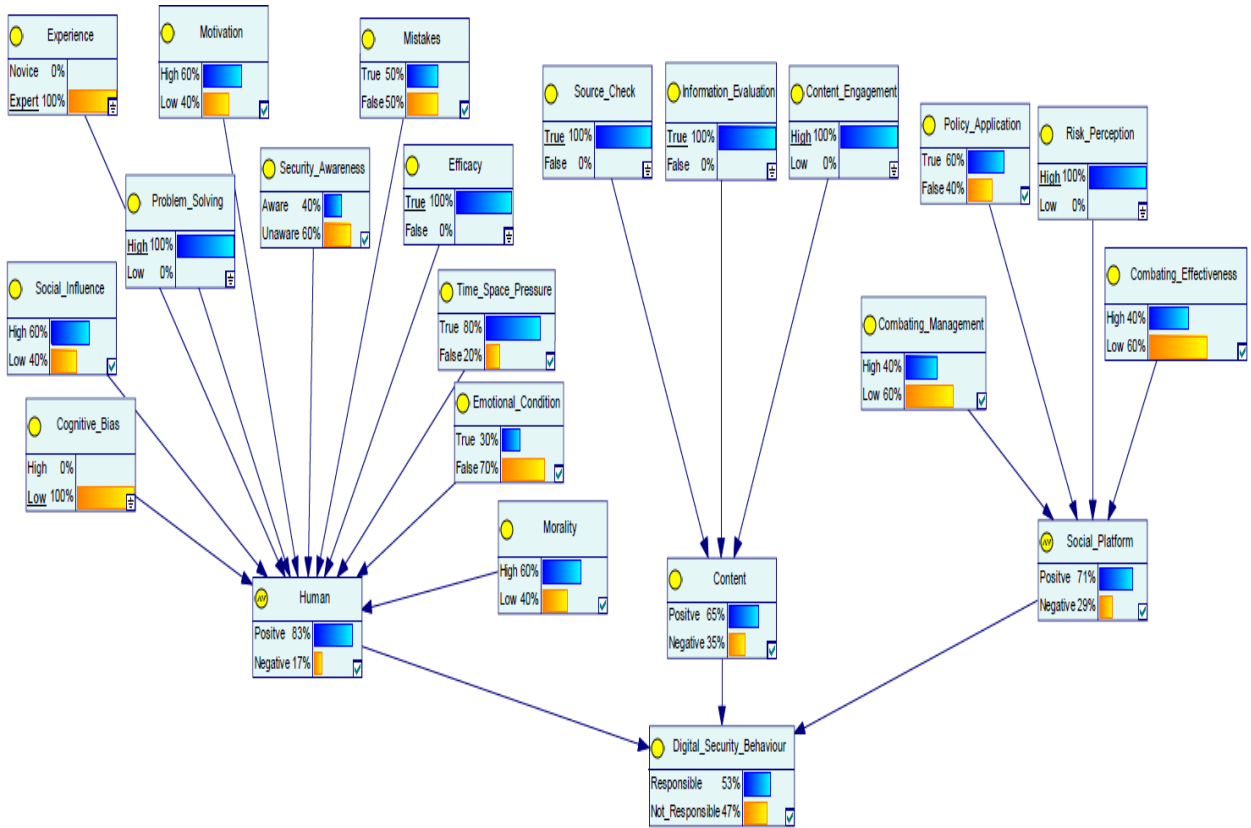


Figure 3. Second demonstration

7. Conclusions and Future Work

Seeing the progress, blend, and pervasiveness of technology (Jongepier & Klenk, 2022) in all societal domains allows one to understand that with and through information capturing evil or malicious intentional goals, manipulation could be inflicted in one's belief and behaviour in diverse digital environments like social media. This directly reflects exploiting users' vulnerabilities which could produce major implications and consequences to both targeted user audiences as well as to other collateral ones (Maathuis, Pieters & van den Berg, 2018a). To be aware and further build (intelligent) tackling and/or countering social media mechanisms, the four cornerstones of an engaging security culture need to be considered: responsibility, trust, communication, and cooperation (Ki-Aries & Faily, 2017). As the last two aspects represent a different type of research than the one conducted herein, the first two aspects are correlated and directly tackled in this research by building a responsible digital security behaviour model for social media using AI. Accordingly, multidisciplinary research is conducted using the Design Science Research methodology, and relevant influencing factors on this behaviour are gathered and clustered in three categories of factors: human, content, and social media platform. Moreover, the model proposed classifies the predicted behaviour as being responsible and irresponsible and is evaluated through demonstration based on synthetical data. The model can represent a basis for establishing proper user socio-technical recommendations for either building or enhancing the responsible digital security behaviour in relation to social media manipulation.

Furthermore, other dimensions and influence factors will be considered in future research through a socio-technical approach to capture, assess, and instantiate, e.g., governance, legal, and ethical factors to building and/or enhancing responsible digital security behaviour when dealing or countering social media manipulation. Conclusively, this research contributes to building responsible, transparent, and accountable AI-based solutions for developing awareness and resilience actively preventing, identifying, dealing, and countering social media manipulation which continues to increase in complexity, intelligence, and adaptivity.

References

- Ansar, W., & Goswami, S. (2021). Combating the menace: A survey on characterization and detection of fake news from a data science perspective. *International Journal of Information Management Data Insights*, 1(2), 100052.
- Bada, M., Sasse, A. M., & Nurse, J. R. (2019). Cyber security awareness campaigns: Why do they fail to change behaviour? *arXiv preprint arXiv:1901.02672*.
- Bay, S., Fredheim, R., Haiduchyk, T. & Dek, A. (2021). Social media manipulation 2021/2022: assessing the ability of social media companies to combat platform manipulation. NATO STRATCOM COE.
- Bontcheva, K., Posetti, J., Teyssou, D., Meyer, T., Gregory, S., Hanot, C., & Maynard, D. (2020). Balancing act: Countering digital disinformation while respecting freedom of expression. *Geneva, Switzerland: United Nations Educational, Scientific and Cultural Organization*.
- Bradshaw, S., & Howard, P. N. (2018). Challenging truth and trust: A global inventory of organized social media manipulation. *The computational propaganda project*, 1, pp. 1-26.
- Brangetto, P., & Veenendaal, M. A. (2016). Influence cyber operations: The use of cyberattacks in support of influence operations. In *2016 8th International Conference on Cyber Conflict (CyCon)* IEEE, pp. 113-126.
- Caled, D., & Silva, M. J. (2022). Digital media and misinformation: An outlook on multidisciplinary strategies against manipulation. *Journal of Computational Social Science*, vol. 5(1), pp. 123-159.
- Chockalingam, S., & Maathuis, C. (2022). An Ontology for Effective Security Incident Management. In *International Conference on Cyber Warfare and Security* (Vol. 17, No. 1, pp. 26-35).
- Cinelli, M., Conti, M., Finos, L., Grisolia, F., Novak, P. K., Peruzzi, A., ... & Quattrociocchi, W. (2019). (Mis) Information Operations. *Journal of Information Warfare*, vol. 18(3), pp. 83-98.
- Chowdhury, N. H., Adam, M. T., & Skinner, G. (2019). The impact of time pressure on cybersecurity behaviour: a systematic literature review. *Behaviour & Information Technology*, vol. 38(12), pp. 1290-1308.
- European Commission (2022). Tackling online disinformation. <https://digital-strategy.ec.europa.eu/en/policies/online-disinformation>.
- Effron, D. A., & Helgason, B. A. (2022). The Moral Psychology of Misinformation: Why We Excuse Dishonesty in a Post-Truth World. *Current Opinion in Psychology*, 101375.
- Fard, A. E., & Maathuis, C. (2021). Toward Capturing the Underlying Offensive Mechanisms of Social Manipulation: A Data Model Approach.
- Fitton, O. (2016). Cyber operations and gray zones: Challenges for NATO. *Connections*, vol. 15(2), pp. 109-119.
- Fitzpatrick, N. (2018). Media manipulation 2.0: the impact of social media on news, competition, and accuracy.
- Gill, T. D., & Ziolkowski, K. (2013). Non-intervention in the Cyber Context. *Peacetime Regime for State Activities in Cyberspace International Law. International Relations and Diplomacy. NATO CCDCOE, Tallinn*, pp. 217-238.
- Guess, A. M., & Lyons, B. A. (2020). Misinformation, disinformation, and online propaganda. *Social media and democracy: The state of the field, prospects for reform*.

- Horowitz, M., Cushion, S., Dragomir, M., Gutiérrez Manjón, S., & Pantti, M. (2022). A framework for assessing the role of public service media organizations in countering disinformation. *Digital Journalism*, vol. 10(5), pp. 843-865.
- Jongepier, F., & Klenk, M. (2022). *The Philosophy of Online Manipulation*. Routledge.
- Kamarulzaman, M. S., Shuhidan, S. M., & Wahid, K. A. (2022, September). The Moderating Role of Information Security Behaviour (ISB) on the Relationship between Digital Literacy (DL) and Information Security Culture (ISC): A Proposed Research Framework. In *Proceedings* (Vol. 82, No. 1, p. 35). MDPI.
- Kapantai, E., Christopoulou, A., Berberidis, C., & Peristeras, V. (2021). A systematic literature review on disinformation: Toward a unified taxonomical framework. *New media & society*, vol. 23(5), pp. 1301-1326.
- Ki-Aries, D., & Faily, S. (2017). Persona-centred information security awareness. *computers & security*, vol. 70, pp. 663-674.
- Li, Y. J., Marga, J. J., Cheung, C. M., Shen, X. L., & Lee, M. (2022). Health Misinformation on social media: A Systematic Literature Review and Future Research Directions. *AIS Transactions on Human-Computer Interaction*, vol. 14(2), pp. 116-149.
- Maathuis, C., Pieters, W., & van den Berg, J. (2018a). Developing a cyber operations computational ontology. *Journal of Information Warfare*, vol. 17(3), pp. 32-49.
- Maathuis, C., Pieters, W., & van den Berg, J. (2018b). A knowledge-based model for assessing the effects of cyber warfare. In *Proceedings of the 12th NATO Conference on Operations Research and Analysis*.
- Maathuis, C., & Chockalingam, S. (2022a). Responsible Digital Security Behaviour: Definition and Assessment Model. In *European Conference on Cyber Warfare and Security* (Vol. 21, No. 1).
- Maathuis, C., & Chockalingam, S. (2022b). Victim versus Offender: Behaviour Modelling during Covid-19 Pandemic Cyber Attacks.
- Maathuis, C. (2022a). An Outlook of Digital Twins in Offensive Military Cyber Operations. ECIAIR 2022. In *European Conference on the Impact of Artificial Intelligence and Robotics*, vol. 4, no. 1.
- Maathuis, C. (2022b). On the Road to Designing Responsible AI Systems in Military Cyber Operations. In *European Conference on Cyber Warfare and Security* (Vol. 21, No. 1, pp. 170-177).
- Mashiane, T., & Kritzing, E. (2018). Cybersecurity behaviour: A conceptual taxonomy. In *IFIP International Conference on Information Security Theory and Practice* (pp. 147-156).
- Mavrodieva, A. V., Rachman, O. K., Harahap, V. B., & Shaw, R. (2019). Role of social media as a soft power tool in raising public awareness and engagement in addressing climate change. *Climate*, vol. 7(10), pp. 122.
- Mazarr, M. J., Casey, A., Demus, A., Harold, S. W., Matthews, L. J., Beauchamp-Mustafaga, N., & Sladden, J. (2019). Hostile social manipulation present realities and emerging trends.
- Mridha, M. F., Keya, A. J., Hamid, M. A., Monowar, M. M., & Rahman, M. S. (2021). A Comprehensive Review on Fake News Detection with Deep Learning. *IEEE Access*.
- Marcot, B. G., & Penman, T. D. (2019). Advances in Bayesian network modelling: Integration of modelling technologies. *Environmental modelling & software*, vol. 111, pp. 386-393.
- Moran, G., Muzellec, L., & Johnson, D. (2019). Message content features and social media engagement: evidence from the media industry. *Journal of Product & Brand Management*.
- NATO (2020). NATO's approach to countering disinformation: a focus on Covid-19. <https://www.nato.int/cps/en/natohq/177273.htm>
- Nielsen, L. (2015). *The Encyclopedia of human-computer interaction*. 2nd ed. Aarhus, Denmark: The Interaction Design Foundation; 2015 [Chapter 30]. Available from: <https://www.interaction-design.org/encyclopedia/personas.html>.
- Pavlik, J. (2022). The Russian War in Ukraine and the Implications for the News Media. *Athens Journal of Mass Media and Communications*.
- Pennycook, G., & Rand, D. G. (2021). The psychology of fake news. *Trends in cognitive sciences*, vol. 25(5), pp. 388-402.
- Peffer, K., Tuunanen, T., Rothenberger, M. A., & Chatterjee, S. (2007). A design science research methodology for information systems research. *Journal of management information systems*, vol. 24(3), pp. 45-77.
- Peffer, K., Tuunanen, T., & Niehaves, B. (2018). Design science research genres: introduction to the special issue on exemplars and criteria for applicable design science research.
- Perski, O., Blandford, A., West, R., & Michie, S. (2017). Conceptualising engagement with digital behaviour change interventions: a systematic review using principles from critical interpretive synthesis. *Translational behavioral medicine*, vol. 7(2), pp. 254-267.
- Petratos, P. N. (2021). Misinformation, disinformation, and fake news: Cyber risks to business. *Business Horizons*, vol. 64(6), pp. 763-774.
- Reisach, U. (2021). The responsibility of social media in times of societal and political manipulation. *European journal of operational research*, vol. 291(3), pp. 906-917.
- Schreiner, M., Fischer, T., & Riedl, R. (2021). Impact of content characteristics and emotion on behavioral engagement in social media: literature review and research agenda. *Electronic Commerce Research*, vol. 21(2), pp. 329-345.
- Traberg, C. S., Roozenbeek, J., & van der Linden, S. (2022). Psychological inoculation against misinformation: Current evidence and future directions. *The ANNALS of the American Academy of Political and Social Science*, vol. 700(1), pp. 136-151.
- Van Der Gaag, L. C. (1996). Bayesian belief networks: odds and ends. *The Computer Journal*, vol. 39(2), pp. 97-113.
- Wu, L., Morstatter, F., Carley, K. M., & Liu, H. (2019). Misinformation in social media: definition, manipulation, and detection. *ACM SIGKDD Explorations Newsletter*, vol. 21(2), pp. 80-90.

Analyzing the Role of Ukrainian and Russian Diaspora in Disinformation Campaigns

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Abstract: Recent digital technological developments facilitate the translation, empowerment, and extension of expressing individual and collective ideas, beliefs, and attitudes towards specific concepts and events through different social platforms. In this complex arena, social media manipulation campaigns and corresponding mechanisms like disinformation and misinformation are used through techniques like deep fakes and fake news for, e.g., altering existing information and spreading manufactured information to {targeted, diverse} audiences or producing polarization among communities and users. Nevertheless, academic and practitioner efforts to capture, control, and limit social manipulation techniques exist in the form of strategies and policies based on human intelligence, Artificial Intelligence, or a combination thereof. However, such mechanisms and consonant techniques advance in adaptivity and complexity and can reach and impact broader communities. On this behalf, and especially in conjunction with the ongoing events surrounding the ongoing war in Ukraine, increased attention and dedication is shown to both current and recent events surrounding this conflict, e.g., Crimea's annexation and the MH17 crash in 2014. Such events characterize old battles of ongoing conflicts that could teach important lessons on understanding the role and involvement of Russian and Ukrainian diaspora communities in corresponding social manipulation discourses in social platforms like Twitter and Facebook. To tackle this, multidisciplinary research is conducted using the Design Science Research methodology following the Data Science approach building a series of Machine Learning models. Accordingly, this research aims to build and bring social awareness and resilience to both users and social media policy decision-makers on the role, involvement, and implications of diaspora digital communities in conflicts.

Keywords: information operations, cyber operations, diaspora, social manipulation, disinformation, machine learning.

1. Introduction

"The signal is the truth. The noise is what distracts us from truth." (Nate Silver)

As an ability, mobility characterizes life-based entities such as humans along with non-life-based entities like cars, airplanes, and particularly, more complex constructions like information which travels at incredible high speeds through different ICT-based environments. Remaining in the ICT-based arena and acknowledging its role and involvement for decades in both peace and war related settings and activities (Brinkerhoff, 2006), and going deeper to focusing on one such environment – social media – it is important to acknowledge the projection of human perspectives, beliefs, and activities herein: these play roles like initiator, propagator, amplifier, or receiver in different social media discourses. In these lines, different opinions and experiences were shared and continue to be shared in conflicts like the ones in Afghanistan, Syria, and Ukraine (Dodge, Elgert & Paul, 2022) inside the countries, their corresponding diaspora, and globally (Carter, 2005; Kozachenko, 2018; Minora et al., 2022; Slobozhan, Brik & Sharma, 2022). Specifically, the scale and intensity of discourses and narratives regarding Ukraine significantly increased since the Euromaidan, annexation of Crimea, MH17 flight crash, and ongoing conflict. While these activities are labelled as gray zone conflicts, new frozen conflicts, or parts of ongoing hybrid warfare strategies (Fitton, 2016; Maathuis, Pieters, van den berg, 2018a), they actively involve nationals and diaspora communities showing a traceable emergence through both hesitation and direct involvement (Kozachenko, 2018). Coupling these aspects with the ongoing advancements of social manipulation mechanisms like disinformation and misinformation for intentionally or unintentionally fabricating or altering information by users and dedicated organizations like specialized cyber troops following complex strategies (Bradshaw & Howard, 2018), implies (in)direct exposure to real facts and noise that can influence one's beliefs and behavior at both individual and collective levels. While these issues occupy an important role in scientific and practitioner agendas and efforts, limited attention is dedicated to understanding the role and interaction between diaspora communities and social media manipulation. To tackle this issue, this research aims to investigate the role that diaspora has in relation to disinformation propagation, specifically focusing on Ukrainian and Russian diaspora. To achieve this aim, multidisciplinary research is conducted merging studies and techniques from social media manipulation, digital diaspora and diaspora studies, international relations, and AI domains following a Design Science Research methodological approach (Peffer et al., 2007; Peffer, Tuunanen & Niehaves, 2018). Through this approach, two datasets are constructed with data from 2014-2015, and a series

of Machine Learning models are built aiming to answering the main research question: *What is the interaction between diaspora users and disinformation campaigns on Twitter surrounding the initial phase of the ongoing Russian-Ukraine conflict?* Hence, the main contributions of this research are defined as follows:

- To the scientific community by encouraging further multidisciplinary research relying on data and AI-based models further complemented by multi-domain expert knowledge for properly understanding the dynamics and interaction inside and between diaspora and social manipulation in conflict time.
- To different social media platforms and relevant organizations which have the power to release publicly available datasets and further contribute to open science efforts for tackling/countering social media manipulation mechanisms in relation to former, ongoing, or anticipated conflicts.

The outline of this article is assembled as follows. Section 2 sets the context and tackles related studies considering the multidisciplinary nature of this research. Section 3 presents the methodological approach taken for achieving the aim of this research. Section 4 addresses the data collection process for building the underlying AI models of this research. Section 5 discusses the implementation of the models proposed together with the results obtained. Section 6 reflects on the findings of this research and future research lines.

2. Disinformation and Diaspora Related Research

As a concept, diaspora implies a population that leaves the homeland to a new land being surrounded in its space by its (collective) memory and myths about the homeland, in some situations even an idealization of the home notion, a continuous connection or a (fragmented) return to the homeland, ethnic group consciousness over time, in some cases a troubled relationship with host societies, a sense of co-responsibility to host societies and co-ethnics, and the possibility of an improved life (Cohen, 2008). Diaspora implies living diasporic experiences through both incompleteness and extension of oneself. Being able to experience these inside and through digital realms like social media enhances one's needs for representation, communication, and exchange of information with others (Georgiou, 2013; Kurbalija, 2013): this facilitated the creation of a recently introduced concept: digital diaspora. Nevertheless, social media is a part of cyberspace which is a dynamic, complex, and uncertain domain (Maathuis, 2022d), implying that its users are directly exposed to malicious agents and their manipulation mechanisms through actions like purposeful and systematic information falsification or alteration that could influence users' beliefs and behaviours (Brangetto & Veenendaal, 2016; Maathuis & Chockalingam, 2022a). Moreover, social manipulation or influence operations like discrediting, destabilizing, undermining, or promoting specific maliciously intended groups, improving one's attitude towards an aggressor, or generating tension and/or conflict among (members of) a society use mechanisms like disinformation or misinformation; shortly: disinformation implies fabricating and using intentionally altered or false information while misinformation implies unintentionally building and using altered or false information (Wardle & Derakhshan, 2017; Mazarr et al., 2019).

Once the background of this research is introduced, further are analyzed relevant studies for understanding the dimensions of this research taking a multidisciplinary stance, i.e., starting with studies that set the context and going to the last ones that reflect on existing datasets and AI techniques used in this domain. Accordingly, Bhandari (2021) conducts a review for conceptualizing diaspora and cultural identity of immigrants categorizing four phases/groups in this process: (i) the forced migration of immigrants including Jewish, Africans, and Armenian communities, (ii) historical, cultural, and social diversities of people, (iii) deconstruction of the bipolar perspective of home versus host country through appreciation of inconsistencies and fluidities of immigrants' identity, and (iv) relevance of the origin and historical exploitation of people from poor countries. One of the first studies in this direction is conducted by (Brinkerhoff, 2006) which analyzed the influence of digital diaspora in Egyptian Copt community focusing on the role of the U.S. Copt Association for supporting a more democratic government in Egypt. Ajder (2018) conducts a pilot survey for understanding how Romanian diaspora Facebook groups build the public sphere where public opinion is formed, how they can shape political subjectivity, and what is the impact of their administrators as community organizers. Zhang & Zhao (2020) analyzes the unique role of Chinese diaspora vloggers during the Covid-19 pandemic through manual keyword search and chance sampling following platform recommendations on YouTube. The results obtained show that vloggers have universal feelings like fears and culturally specific ones like mask-wearing related while inviting their viewers to construct their emotional experience revealing a new form of migrant identity and its role in delivering health-related information in this crisis. Moreover, Heyd (2016) defines an important notion for understanding digital diaspora: narratives of belonging. The author argues that this concept brings together two evocative notions: storytelling "as a fundamental human activity and linguistic act of identity" and belonging "as a category that is

relevant to all explorations to all human experience in societies marked by globalization and mobility". For this notion, Heyd (2016) identifies four criteria when analyzing diaspora text: personal narratives, i.e., reflecting an episode that is personalized and related to a lived individual experience, account of events, reference to components embedded in the notion of belonging, and evaluation through, e.g., critical positioning towards narrated events. Kozachenko (2018) analyzes the role of global Ukrainian diaspora in supporting democratic changes in Ukraine as representatives of Ukrainian national identity that promotes visions about Ukraine's past and future through re-inventing and re-imagining the national belonging. At the same time, Hartmann, Golovchenko & Augenstein (2019) investigates the circulation of disinformation related to the MH17 plane crash analyzing pro-Ukrainian and pro-Russian perspective on Twitter datasets. Furthermore, Korzh, Kovalchuk & Marshall (2022) analyze the motivation behind the movement created by Ukrainian diaspora to support Euromaidan based on symbolic and psychological causes outside and through social media platforms like Facebook and Twitter, while Slobozhan, Brik & Sharma (2022) investigate a new Facebook dataset for analyzing the Euromaidan protest between November 2013 to February 2014 focusing on linguistic aspects. While the authors stress the need for more studies on the dynamics of online protests, among the results found is the fact that while both Ukrainian and Russian languages are used, among the protesters Russian language was used for maximizing outreach.

These studies show the relevance of using different AI techniques for both descriptive and predictive purposes. Additionally, Choras et al., (2021), Kapantai et al., (2021), and Rani, Das & Bhardwaj (2022) review and discuss valuable AI solutions and results obtained when detecting social mechanisms like disinformation and misinformation. Along these lines, Mridha et al., (2021) perform a comprehensive literature review on deep learning techniques successfully used for fake news detection. Moreover, Mullah & Zainon (2021) conduct a review on ML techniques for hate speech detection in social media reflecting on using different techniques like decision trees, SVM (Support Vector Machine), random forests plus BoW (Bag of Words) and N-grams for feature extraction, and evaluation criteria such as F1-score, precision, and recall. Next to these research studies, societal and governmental initiatives exist for strengthening diasporic communities through a global approach to consolidate efforts on diaspora engagement for development proposed by the European Commission that built the EU Global Diaspora Facility (EUDiF) (European Commission, 2020). Another relevant platform is iDiaspora which is sustained by the United Nations for global engagement as a knowledge exchange hub for sharing opinions, ideas, experiences, and best practices for building sustainable positive change and maximizing diaspora's impact (United Nations, 2022).

Based on the comprehensive review conducted in this research it can be concluded that while different dimensions of the ongoing conflict between Russia and Ukraine are tackled through different studies, e.g., annexation of Crimea, Euromaidan, and current events, still limited studies are dedicated to understanding diaspora's role in relation to disinformation propagation in social media. Consequently, this represents the knowledge gap that this research tackles implementing ML models that have already shown good results in different social media analytics and social manipulation detection solutions.

3. Research Methodology

To accomplish the aim of this research, i.e., to investigate the role of diaspora in relation to disinformation propagation in social media, multidisciplinary research is conducted in social media manipulation, diaspora studies, international relations, and AI domains. Hence, the following research question is formulated: *What is the interaction between diaspora users and disinformation campaigns on Twitter surrounding the ongoing Russian-Ukraine conflict?* To find an answer to this question while considering the societal role and impact of this research, the Design Science Research methodology (Peppers et al., 2007; Peppers, Tuunanen & Niehaves, 2018) is used in a Data Science approach. Accordingly, the following research activities are taken:

- Solution objective: the goal of this research is split into four smaller objectives: (i) to gather relevant disinformation campaigns surrounding the ongoing Russian-Ukraine conflict from 2014-2015, (ii) to collect insights about user communities interacting with the identified disinformation campaigns, (iii) to select ML techniques and build corresponding ML models for analysing diaspora membership, and (iv) to capture and understand the relationship between the communities found and diaspora members.
- Design and development: to achieve these goals, relevant datasets are searched and further constructed so that ML models can be built and evaluated.

- **Demonstration:** for the first goal, two new Twitter datasets are created containing messages interacting with disinformation campaigns; for the second goal, by applying community detection algorithms, user communities are identified; for the third goal, diaspora membership is computed as a ML classification problem resulting in Ukrainian, Russian, or non/other; for the fourth goal, a mapping is created between the second and third goals so that possible relationships between user communities and diaspora can be found. Accordingly, these processes are built in C# using the .NET framework and Python.
- **Evaluation and Communication:** the evaluation is conducted using specific evaluation metrics and the results are transparently discussed. Moreover, the results are communicated through this article and corresponding scientific presentations.

4. Data Collection

To understand the dynamics involved and achieve the aim defined, social media information gathering is performed (Maybaum & Ziolkowski, 2013) focusing on the first stage of the Russian-Ukraine conflict since February 2014 starting with Crimea's annexation and continuing with the conflict in Donbas until end of 2015. This process is carried out in two phases: first, by using the StopFake checker which focuses on the Russian-Ukrainian conflict (Stopfake, 2021) from where a set of articles is selected (see Figure 1), and second, by continuing with Twitter search based on extracted keywords in the first phase (see Figure 2).

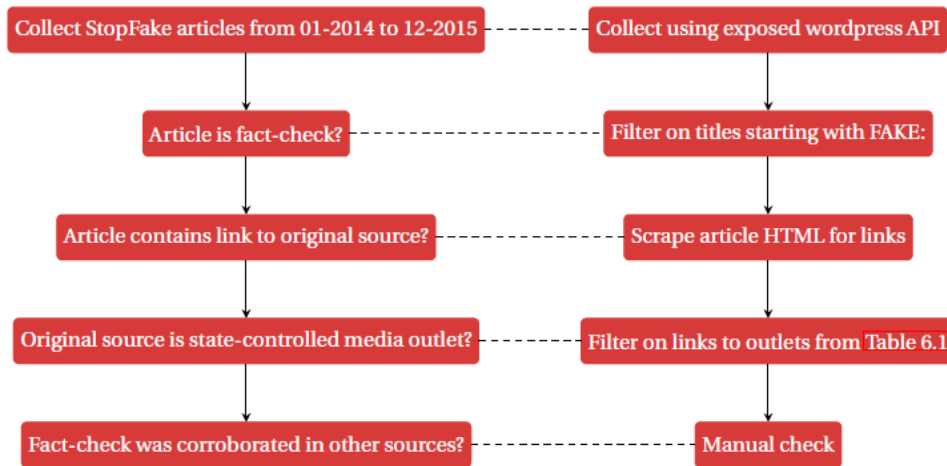


Figure 1. Data collection first phase

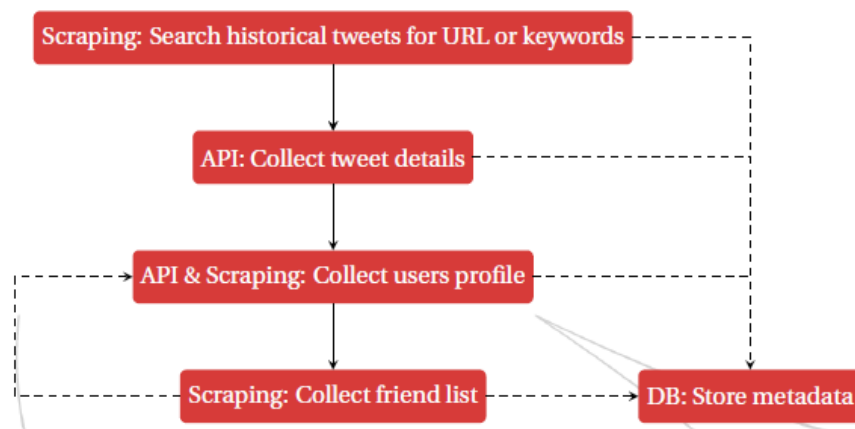


Figure 2. Data collection second phase entity relation diagram

Hence, two datasets are built as follows:

- **Dataset 1** contains all messages with content about the Donbas region in English language which means 155444 tweets, 22068 users, 83142 user mentions, 9993 hashtags and 66565 linked URLs.

- Dataset 2 contains disinformation messages about the MH17 crash (Hartmann, Golovchenko & Augenstein, 2019; Torenvlied et al., 2015) limited to one month before and one month after the flight was shut down, i.e., between 17.07.2014 and 31.09.2014 which means 3961 tweets, 3074 users, 1229 user mentions, 369 hashtags and 1701 linked URLs.

5. Models Implementation and Results

Considering the analysis conducted in the related studies to this research and the results obtained through the application of different AI techniques and technologies for tackling different social media aspects and issues, to achieve the next three objectives of this research, a combination of baseline ML algorithms, social network analysis, and NLP (Natural Language Processing) techniques are considered and discussed.

To gather insights about user communities interacting with the identified disinformation communities, a network analysis is conducted using mention networks considering the approach taken by Helmus (2018) followed by text analysis in the communities identified. Accordingly, the mention network is built as a directed graph of user-to-user mentions where each user (u) is represented as a vertex, mention relationship is represented through a directed edge, and the weight assigned to each edge indicates the number of mentions between users, as depicted in Figure 3. Furthermore, the visualization is done using the force-directed layout algorithm proposed by Jacomy et al. (2014) which minimizes the number of overlapping edges while retaining an equal edge length for each edge. By applying noise reduction for the first dataset to reduce the number of overall relationships and get a better understanding of the well-connected vertices, i.e., removing vertices with an in or out degree less than 5 or more than 1020, results in 1727 vertices and 12195 edges (from 18093 vertices and 49454 edges without noise reduction), as depicted in Figure 4 left. For the second dataset the second mention is smaller and through size reduction contains 690 vertices and 733 edges (from 1236 vertices and 1095 edges) as captured in Figure 4 right.

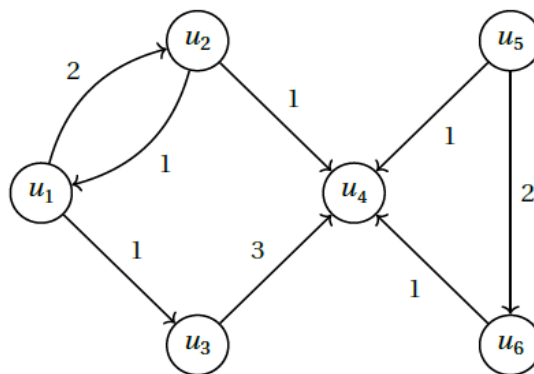


Figure 3. Simplified mention network

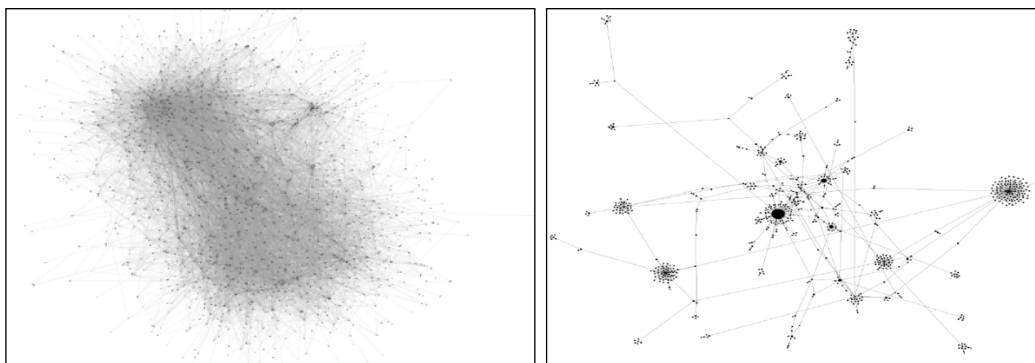


Figure 4. Mention networks: simplified (left) and full (right)

Furthermore, the Leiden community detection algorithm developed by Traag, Waltman & Eck (2019) is used for the first dataset for finding groups of vertices within the graph that are more connected internally and less connected to other vertices in the graph. Hence, 16 communities are identified and the largest 6 are selected for additional analysis since they contain more than 100 users and further illustrated in Figure 5 left with their corresponding Gephi visualization captured in Figure 5 right.

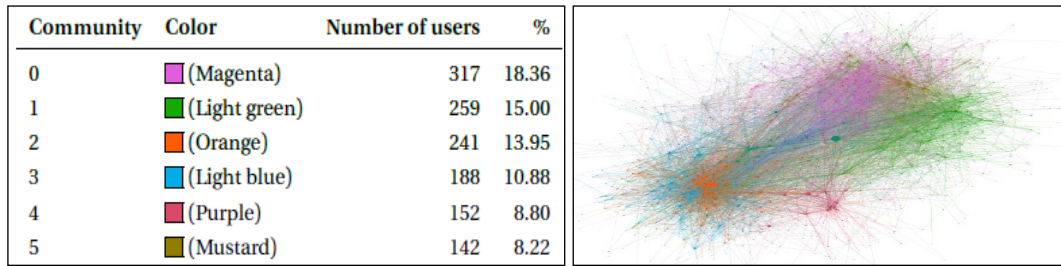


Figure 5. Top six communities based: colours (left), capture (right)

Furthermore, for understanding the topics and keywords used within these communities, the (NLTK) library is used so that the Tweets of the users inside these communities are pre-processed (e.g., tokenization, removal of unnecessary characters like stopwords, lemmatization) and analysed to extract the top 10-word pairs (bigrams) and URL domains for each community using TF-IDF (Term Frequency-Inverse Document Frequency), as captured in Figure 6 and Figure 7 with the corresponding community sentiment captured in Figure 8.

Bigrams	Bigrams
save people	russian troop
ukrainian army	special status
war crime	russian army
kill people	humanitarian aid
child woman	russian soldier
killed child	ukrainian army
child ukrainian	right sector
save child	humanitarian convoy
poroshenko fascist	russian military
ukrainian troop	look like
fascist poroshenko	artillery strike
people killed	conflict zone
sos people	osce mission
woman elderly	minsk agreement
russian military	ukrainian soldier
poroshenko kill	people republic
junta killed	occupied area
fascist junta	putin want
look poroshenko	frozen conflict
people look	martial law

Figure 6. Clusters of topics discussed (selection)

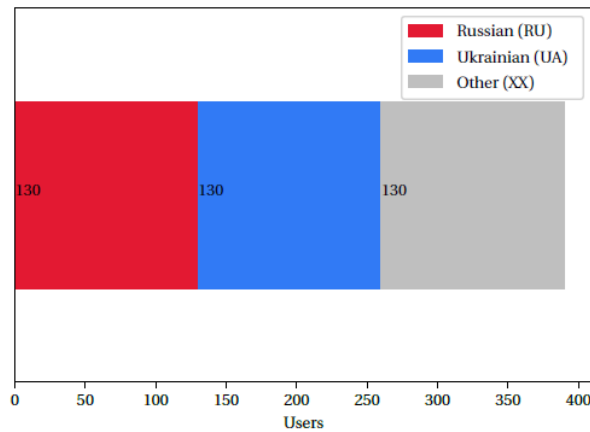
URL	Count	Domain	Count	URL	Count
www.youtube.com	770	www.youtube.com	785	www.youtube.com	206
tass.com	357	euromaidanpress.com	632	shar.es	176
russia-insider.com	355	twitter.com	580	www.facebook.com	157
sputniknews.com	299	j.mp	559	www.globalresearch.ca	155
twitter.com	269	fb.me	480	whereisthefuckingplane.com	114
ln.is	232	liveuamap.com	386	www.businessinsider.com	98
m.vk.com	139	www.facebook.com	363	www.theguardian.com	82
shar.es	112	www.unian.info	299	edition.cnn.com	75
www.facebook.com	102	www.interpretermag.com	246	www.informationng.com	71
www.rt.com	100	translate.google.com	166	www.bloomberg.com	67
youtu.be	84	en.censor.net.ua	159	www.infowars.com	60
novorossia.today	77	24today.net	152	feeds.theguardian.com	55
fb.me	72	www.kyivpost.com	133	news.google.com	45
russian.rt.com	60	khpg.org	127	www.rt.com	44
slavyangrad.org	59	youtu.be	126	goo.gl	40
fortruss.blogspot.com	55	maidantranslations.com	88	watchinga.com	36
rt.com	55	postmodernnews.com	88	linkis.com	31
j.mp	52	www.rferl.org	75	breitbart.com.feedsportal.com	30
www.kyivpost.com	47	inforesist.org	70	www.presstv.ir	30
english.pravda.ru	44	www.pravda.com.ua	69	telegraph.feedsportal.com	28

Figure 7. Clusters of URL domains (selection): first two left from Dataset 1 and third right from Dataset 2

Community	Color	Sentiment
0	■ (Magenta)	pro-Western / pro-Ukrainian
1	■ (Light green)	pro-Western / pro-Ukrainian
2	■ (Orange)	pro-Russian
3	■ (Light blue)	pro-Russian
4	■ (Purple)	pro-Russian
5	■ (Mustard)	pro-Western / pro-Ukrainian

Figure 8. Community sentiment

Once that communities are detected, diaspora profiling is conducted using ML algorithms to predict if the users belong to Ukrainian, Russian, or Other one(s). On this behalf, data distribution is captured in Figure 8 for reflecting the balance of the data used and the features used are related to, e.g., mentioning belong to one of the countries, having one of the flags associated with, country code, using specific RU/UA characters, friends.

**Figure 9. Data distribution**

Hence the following ML techniques are implemented: Random Forest, gradient boosted decision tree, Support Vector Machines, logistic regression, Naïve Bayes, K-Nearest Neighbour, and decision tree. In the initial test, Random Forest is the best performing one. To deal with generalization issues like overfitting (i.e., the model performs well on test data and outperforms on unseen data) and increase the effectivity selection of the model, the cross-validation mechanism is applied with 5 folds (Stratified k-fold cross validation) (Alpaydin, 2010) to make sure that parts and representatives of the data are used in both training and evaluation processes. Furthermore, the optimization process is conducted by tuning hyperparameters of the models implemented through (i) random search which takes all possible parameter configurations within the given ranges and randomly selects a predefined number of combinations to train the model with. The results are then compared using a scoring function which conducts to obtaining the best scoring configuration, followed by an (ii) exhaustive grid search to find the best performing configuration, see Figure 9.

	Precision	Recall	F1-score	Support		Precision	Recall	F1-score	Support		Precision	Recall	F1-score	Support
RU	0.97	0.89	0.93	38	RU	0.97	0.89	0.93	38	RU	0.89	0.87	0.88	38
UA	0.89	0.87	0.88	38	UA	0.82	0.87	0.85	38	UA	0.94	0.82	0.87	38
XX	0.80	0.88	0.84	41	XX	0.79	0.80	0.80	41	XX	0.81	0.93	0.86	41
Macro avg	0.89	0.88	0.88	117	Macro avg	0.86	0.86	0.86	117	Macro avg	0.88	0.87	0.87	117
Weighted avg	0.89	0.88	0.88	117	Weighted avg	0.86	0.85	0.86	117	Weighted avg	0.88	0.87	0.87	117
Accuracy	0.88				Accuracy	0.85				Accuracy	0.87			

Figure 10. Performance metrics for optimized random forests (left), gradient boosted decision tree (middle), SVM (right)

Through cross-validation, the results obtained are shown in Figure 10 where it can be seen that the best performing algorithm is Random Forests.

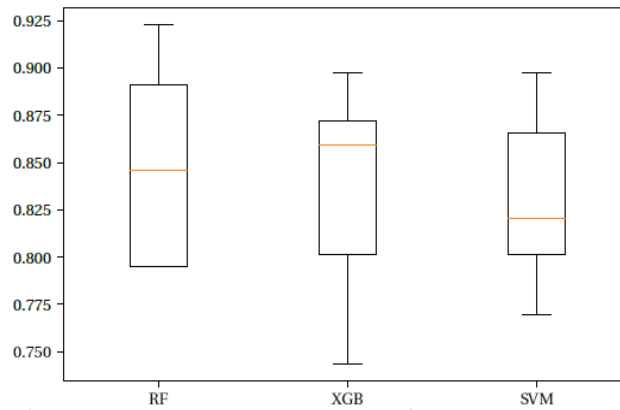


Figure 11. Model performance

Once the communities are identified, and diaspora classification is executed, further meaningful relationships between them is further investigated. Accordingly, for Dataset 1 all user profiles that belong to the top 6 communities are used and the obtained diaspora membership data distribution using Random Forests is captured in Figure 11 left where it can be seen, e.g., that Community 1 has 19% Russian diaspora users, 29% Ukrainian diaspora users, and 52% other. For Dataset 2 the results are different since the topic itself, i.e., MH17 crash has global meaning and implications for other countries like the Netherlands and Malaysia as well, which explains why the Ukrainian and Russian diaspora are represented by 7% (see Figure 11 right).

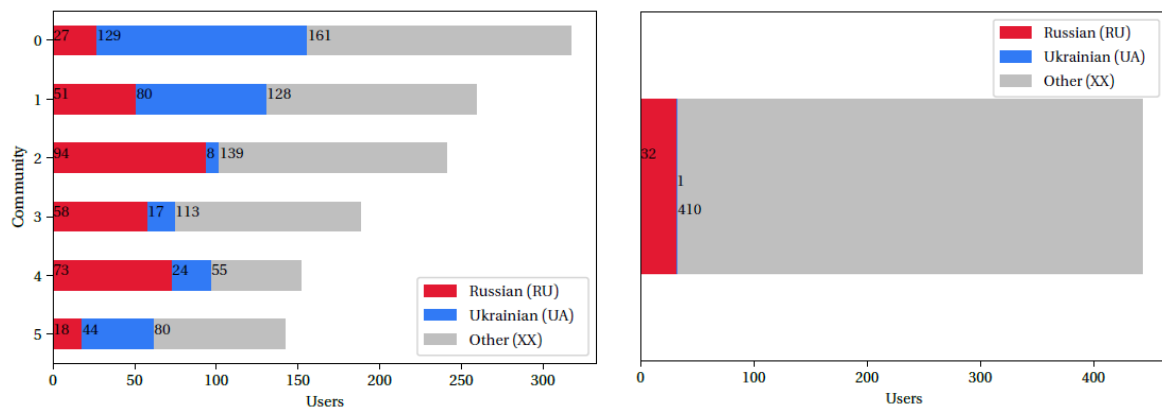


Figure 12. Diaspora membership data distribution for Dataset 1 (left) and Dataset 2 (right)

Based on the results obtained, from Dataset 1 it can be concluded that a general interest is shown to the ongoing conflict between Russia and Ukraine in the period investigated by these communities as well as other global communities, while from Dataset 2 it can be concluded that given the global nature of the topic, the investigated communities are in minority, which implies that these two communities did not play a significant role in spreading disinformation in English language on Twitter.

6. Conclusions

While the ethos of social media is in continuous movement and change due to ongoing societal and technological progress, advancements, and nationally or globally triggered events, its users are (in)directly impacted by (parts of) the cyber/information operations and events either commenced by or propagated to social media discourses and narratives related to actions like behaviour influence and planning disruption as it can be seen for instance in conflicts carried out in the last decade and the ongoing Covid-19 pandemic (Gill & Ziolkowski, 2013; Maathuis, Pieters & an den Berg, 2018b; Yilmaz, 2021; Nakayama, 2022; Chockalingam & Maathuis, 2022). The fact that such discourses and narratives are partially carried out also by diaspora communities (Kozachenko, 2018) in an (un)intentional way through social media manipulation mechanisms like disinformation and misinformation, adds to the complexity, dynamism, and uncertainty surrounding (i) the real goals and target audience of the content, and (ii) understanding the dynamics involved and relations between diaspora communities and social media manipulation mechanisms. Such issues are still open considering the existing academic and practitioner efforts and need to be tackled to be able to build proper, transparent, and accountable intelligent solutions

(Maathuis, 2022b; Maathuis, 2022c) that make users aware and arm them with adaptive means for tackling and/or countering social media manipulation mechanisms. This represents the knowledge gap that this research tackles aiming at investigating the role of diaspora in relation to disinformation propagation in social media. On this behalf, multidisciplinary research is carried out following a Design Science Research methodology in a Data Science approach by building a series of ML models and corresponding datasets with Twitter messages related to the first part of the Russian-Ukraine conflict and corresponding discourses around the situation in Donbas and the MH17 flight crash.

Based on the research conducted, the findings show that diaspora members play a clear role in the general discourses surrounding the Russian-Ukrainian conflict, but based on the existing datasets containing Twitter messages in English an active role in spreading disinformation was not found. Hence, while acknowledging the difficulties of gathering data for research purposes (Walker, S., Mercea, D., & Bastos, 2019), a call for further collecting multi-{domain, source, type} data is made considering other dimensions and events surrounding the investigated conflict for properly grasping the dynamics and role of diaspora members during conflict as a further prerequisite of an intelligent, secure, and safe digital domain.

References

- Ajder, T. (2018). Romanian Diasporic Facebook Groups as Public Spheres. *Open Cultural Studies*, 2(1), 723-734.
- Alpaydin, Ethem (2010). *Introduction to machine learning*. en. 2nd ed. Adaptive computation and machine learning. Cambridge, Mass: MIT Press.
- Brinkerhoff, J. M. (2005). Digital diasporas and governance in semi-authoritarian states: the case of the Egyptian Copts. *Public Administration and Development*, 25(3), 193-204.
- Bhandari, N. B. (2021). Diaspora and Cultural Identity: A Conceptual Review. *Journal of Political Science*, 21, 100-108.
- Bradshaw, S., & Howard, P. N. (2018). Challenging truth and trust: A global inventory of organized social media manipulation. *The computational propaganda project*, 1, 1-26.
- Brangetto, P., & Veenendaal, M. A. (2016). Influence cyber operations: The use of cyberattacks in support of influence operations. In *2016 8th International Conference on Cyber Conflict (CyCon)* (pp. 113-126). IEEE.
- Carter, S. (2005). The geopolitics of diaspora. *Area*, 37(1), 54-63.
- Cohen, R. (2008). *Global diasporas: An introduction*. Routledge.
- Chockalingam, S., & Maathuis, C. (2022). An Ontology for Effective Security Incident Management. In *International Conference on Cyber Warfare and Security*, vol. 17, no. 1, pp. 26-35.
- Choraś, M., Demestichas, K., Giełczyk, A., Herrero, Á., Ksieniewicz, P., Remoundou, K., ... & Woźniak, M. (2021). Advanced Machine Learning techniques for fake news (online disinformation) detection: A systematic mapping study. *Applied Soft Computing*, 101, 107050.
- Dodge, J., Elgert, L., & Paul, R. (2022). On the social relevance of Critical Policy Studies in times of turmoil. *Critical Policy Studies*, 16(2), 131-132.
- European Commission (2020). EU Global Diaspora Facility (EUDiF). https://international-partnerships.ec.europa.eu/news-and-events/stories/eu-launches-global-diaspora-engagement-mapping-and-platform_en
- Fitton, O. (2016). Cyber operations and gray zones: Challenges for NATO. *Connections*, 15(2), 109-119.
- Georgiou, M. (2013). Diaspora in the digital era: Minorities and media representation. *Jemie*, 12, 80.
- Gill, T. D., & Ziolkowski, K. (2013). Non-intervention in the Cyber Context. *Peacetime Regime for State Activities in Cyberspace International Law. International Relations and Diplomacy. NATO CCDCOE, Tallinn*, 217-238.
- Hartmann, M., Golovchenko, Y., & Augenstein, I. (2019). Mapping (dis-) information flow about the MH17 plane crash. *arXiv preprint arXiv:1910.01363*.
- Helmus, T. C. (2018). *Russian social media influence: understanding Russian propaganda in Eastern Europe*. en. Research report (Rand Corporation) RR-2237-OSD. Santa Monica, Calif: RAND Corporation. ISBN: 978-0-8330-9957-0
- Heyd, T. (2016). Narratives of belonging in the digital diaspora: Corpus approaches to a cultural concept. *Open Linguistics*, 2(1).
- Jacomy, M. et al. (J2014). ForceAtlas2, a Continuous Graph Layout Algorithm for Handy Network Visualization Designed for the Gephi Software. en. In: *PLoS ONE* 9.6. Ed. by Mark R. 108 Muldoon, e98679. ISSN: 1932-6203. DOI: 10.1371/journal.pone.0098679.
- Kapantai, E., Christopoulou, A., Berberidis, C., & Peristeras, V. (2021). A systematic literature review on disinformation: Toward a unified taxonomical framework. *New media & society*, 23(5), 1301-1326.
- Kozachenko, I. (2018). "Re-Imagining" the Homeland? Languages and National Belonging in Ukrainian Diasporas since the Euromaidan.
- Korzh, A., Kovalchuk, S., & Marshall, A. (2022). Euromaidan Abroad: The Social Movement Motivations of Young Ukrainian Immigrants. *Nationalities Papers*, 50(2), 262-274.
- Kurbalija, J. (2013). EDiplomacy AND DIPLOMATIC LAW IN THE INTERNET ERA. *PEACETIME REGIME FOR STATE ACTIVITIES IN CYBERSPACE*, 393.
- Maathuis, C., Pieters, W., & van den Berg, J. (2018a). A knowledge-based model for assessing the effects of cyber warfare. In *Proceedings of the 12th NATO Conference on Operations Research and Analysis*.

- Maathuis, C., Pieters, W., & van den Berg, J. (2018b). Developing a cyber operations computational ontology. *Journal of Information Warfare* 17(3), 32-49.
- Maathuis, C., & Chockalingam, S. (2022a). Responsible Digital Security Behaviour: Definition and Assessment Model. In *European Conference on Cyber Warfare and Security* (Vol. 21, No. 1).
- Maathuis, C. (2022b). On the Road to Designing Responsible AI Systems in Military Cyber Operations. In *European Conference on Cyber Warfare and Security* (Vol. 21, No. 1, pp. 170-177).
- Maathuis, C. (2022c). On Explainable AI Solutions for Targeting in Cyber Military Operations. In *International Conference on Cyber Warfare and Security* (Vol. 17, No. 1, pp. 166-175).
- Maathuis, C. (2022d). An Outlook of Digital Twins in Offensive Military Cyber Operations. ECIAIR 2022. In *European Conference on the Impact of Artificial Intelligence and Robotics*, vol. 4, no. 1.
- Maybaum, M., & Ziolkowski, K. (2013). Technical methods, techniques, tools and effects of cyber operations. *Peacetime Regime for State Activities in Cyberspace*, 103-134.
- Mazarr, M. J., Casey, A., Demus, A., Harold, S. W., Matthews, L. J., Beauchamp-Mustafaga, N., & Sladden, J. (2019). Hostile social manipulation present realities and emerging trends. RAND.
- Minora, U., Belmonte, M., Bosco, C., Johnston, D., Giraudy, E., Iacus, S., & Sermi, F. (2022). Migration patterns, friendship networks, and the diaspora: the potential of Facebook's Social Connectedness Index to anticipate migration flows induced by Russia's invasion of Ukraine in the European Union. *arXiv preprint arXiv:2209.01833*.
- Mridha, M. F., Keya, A. J., Hamid, M. A., Monowar, M. M., & Rahman, M. S. (2021). A Comprehensive Review on Fake News Detection with Deep Learning. *IEEE Access*.
- Mullah, N. S., & Zainon, W. M. N. W. (2021). Advances in machine learning algorithms for hate speech detection in social media: a review. *IEEE Access*.
- Nakayama, B. (2022). Democracies and the Future of Offensive (Cyber-Enabled) Information Operations. *The Cyber Defense Review*, 7(3), 49-66.
- NLTK. NLTK Library. <https://www.nltk.org>
- Peffer, K., Tuunanen, T., Rothenberger, M. A., & Chatterjee, S. (2007). A design science research methodology for information systems research. *Journal of management information systems*, 24(3), 45-77.
- Peffer, K., Tuunanen, T., & Niehaves, B. (2018). Design science research genres: introduction to the special issue on exemplars and criteria for applicable design science research.
- Rani, N., Das, P., & Bhardwaj, A. K. (2022). Rumor, misinformation among web: a contemporary review of rumor detection techniques during different web waves. *Concurrency and Computation: Practice and Experience*, 34(1), e6479.
- Slobozhan, I., Brik, T., & Sharma, R. (2022). Longitudinal change in language behaviour during protests: A case study of Euromaidan in Ukraine. *Social Network Analysis and Mining*, 12(1), 1-12.
- StopFake (2021). <https://www.stopfake.org/en/main/>
- Torenvlied, R., Giebels, E., Wessel, R. A., Gutteling, J. M., Moorkamp, M., & Broekema, W. (2015). *Rapport evaluatie nationale crisisbeheersingsorganisatie vlucht MH17*. Enschede: Universiteit Twente.
- Traag, Vincent, Ludo Waltman, and Nees Jan van Eck (Dec. 2019). "From Louvain to Leiden: guaranteeing well-connected communities". en. In: *Scientific Reports* 9.1, p. 5233.
- United Nations (2022). iDiaspora. <https://sdgs.un.org/partnerships/idiapora>
- Walker, S., Mercea, D., & Bastos, M. (2019). The disinformation landscape and the lockdown of social platforms. *Information, Communication & Society*, 22(11), 1531-1543.
- Wardle, C., & Derakhshan, H. (2017). Information disorder: Toward an interdisciplinary framework for research and policymaking.
- Yilmaz, K. Ö. (2021). Mind the Gap: It's About Digital Maturity, Not Technology. In *Managerial Issues in Digital Transformation of Global Modern Corporations* (pp. 222-243). IGI Global.
- Zhang, L. T., & Zhao, S. (2020). Diaspora micro-influencers and COVID-19 communication on social media: The case of Chinese-speaking YouTube vloggers. *Multilingua*, 39(5), 553-563.

First Six Months of War from Ukrainian Topic and Sentiment Analysis

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Abstract: Through technological advancements as well as due to societal trends and developments, social media became an active part and a catalyst of the ongoing conflicts and wars carried out in the physical environment. A direct example on this behalf are the cyber/information operations currently conducted in conjunction with the ongoing Russian-Ukrainian war. Due to such operations packaged in social media manipulation mechanisms like disinformation and misinformation using techniques such as controversies, fake news, and deep fakes, a high degree of confusion and uncertainty surrounds the events happened and users' behaviour and beliefs. These operations also impact the civilians directly affected in the battlefield or their dear and known ones. To tackle this issue, currently limited scientific and objective effort is dedicated in this direction due to, e.g., data, strategic, and emotional implications. It is then the aim of this research to capture the main topics discussed and the feeling expressed by Ukrainian Telegram users on the ongoing Russian-Ukrainian war in 2022 using a Data Science approach by building a series of Machine Learning models based on multi-channel data collected in the first six of months of war. Accordingly, this research directly aims to contribute to efforts on understanding real discourses and dynamics involved in the ongoing conflict through direct resources, producing and sustaining social media security awareness, and building resilience to social media manipulation campaigns using AI.

Keywords: information operations, machine learning, topic modelling, sentiment analysis, Ukraine war, Telegram.

1. Introduction

"We must learn to regard people less in the light of what they do or omit to do, and more in the light of what they suffer." (Dietrich Bonhoeffer)

As a socio-technical system initially built upon the web 2.0 standard using powerful engines facilitating content creation, exchange, interaction, and interpretation, the social media environment evolved to a space of opinions and a battlefield between either physical and/or digital agents (Dodonov et al., 2019) through e.g., discourses and narratives manipulation based on mechanisms such as disinformation and misinformation, radical ideologies, and even silencing alternatives of opinions conducting activities like influencing political decision-making, encouragement of anti-government movements/protests, influencing and confusing perceptions and actions of young generations to accept/follow radical agendas, planning and conducting cyber operations (Haroro, 2015; Alassad, Spann & Agarwal, 2021; Maathuis, 2022a). Such activities for influencing users' behaviours, attitudes, and beliefs in relation to the ongoing war in Ukraine are carried out in different social media platforms like Facebook, Twitter, and Telegram. However, while a vast number of studies investigate different dimensions of this conflict through strategic, financial, legal, and ethical lenses, limited attention to Ukrainian voices and perspectives is given (Vorbrugg & Bluwstein, 2022). Aforesaid research facilitates building transparent (intelligent) approaches for social opinion analysis, politics characterization, and user relationships understanding (Zhu et al., 2022; Maathuis, 2022b). This gap directly applies to Telegram analytics in relation to the ongoing war in Ukraine although this social media platform is still the dominant platform in the field (Höhn, Mauw & Asher, 2022; NPR, 2022). Hence, this aim of this research is to build intelligent mechanisms for capturing topics discussed and corresponding sentiments of Ukrainian Telegram users. This further translates to intending to find answers to the following research questions:

- RQ1: How to capture and analyze the topics discussed and sentiments associated with them in Ukrainian language from the first six months of conflict in Ukraine?
- RQ2: What are the topics discussed and corresponding sentiments of Ukrainians in the first six months of conflict in Ukraine?

To find answers to the above formulated research questions while acknowledging the multidisciplinary nature of this research, its societal role, and its underlying technical origins, a Design Science Research methodology is taken through a Data Science research approach having the following contributions:

- In respect with the technical nature, a mix of Machine Learning techniques is considered for building intelligent solutions for extracting and analyzing topics and their corresponding sentiments based on a dataset containing messages of Ukrainian speaking Telegram users in the first six months of war, i.e., from February 24, 2022, to August 23, 2022.
- In respect with the social nature, the topics extracted, and corresponding sentiments analysed are depicted and further related to corresponding academic and societal efforts.

The outline of this article is structured as follows. Section 2 tackles the context and related studies to this research focusing on both social as well as technical dimensions and approaches. Section 3 discusses the research approach taken, i.e., Design Science Research methodology in a Data Science setting. Section 4 introduces the dataset built and the implementation of the two analytical mechanisms using different ML techniques, meaning topic modelling and sentiment analysis. Section 5 reflects on the results obtained. Conclusively, Section 6 discusses the findings of this research and future research perspectives.

2. Related Research

Given the vast flow of information in the social media discourses and narratives surrounding different conflicts, Al Assad, Spann & Agarwal (2021) propose a method for identifying malicious behaviour with corresponding actors responsible for propagating this behaviour using methods like focal structure analysis for further gathering information about the actors conducting them and preventing future attacks. On malicious threats conducting social media manipulation campaigns and operations, Cinelli et al., (2019) argue that the nature of information threats is defined by social dynamics and cognitive layer of users involved since a noticeable tendency of users to interact with and reason about information adhering to their preferred narrative exists. In these lines, confirmation bias plays a role in users' decisions on grasping/spreading information, and to increase users' ability to tackling/countering {dis, mis}information and increase effective communication, smoothing polarization is mandatory. Among the methods to analyze and understand such aspects are AI-based methods like topic modelling and sentiment analysis. Waissbluth et al., (2022) conduct a domain-level analysis to investigate if a domain is complicit in distributing or amplifying disinformation based on Telegram and Twitter social media platforms for enhancing trust and sanity in online communities. On this behalf, Sokolova et al. (2016) execute a topic modelling and event identification analysis using LDA (Latent Dirichlet Allocation) on four datasets surrounding challenging social events from Kenya proving the effectivity of extracting and summarizing discourse topics for further supporting analytical and decision-making processes. Agüero-Torales, Salas & López-Herrera (2021) conduct an extensive literature review on sentiment analysis on social media discourses using deep learning techniques for capturing underlying ideas and commonalities on the solutions proposed acknowledging facts like cross-lingual interest and trend of using less complex learning architectures. Moreover, Ates et al., (2021) build a series of solutions for understanding the dynamics involved in the use of social media communities of gendarmerie and police organizations from Turkiye, Italy, France, and Spain. Applied in the context of the Covid-19 pandemic, Tsao et al., (2021) perform a systematic literature review on social media discourses and narratives capturing public attitudes, identifying infodemics, mental health issues, governmental responses, and health information quality with the issue of real-time surveillance and advancements of social manipulation mechanisms based on large and diverse social platforms datasets. Going further to the context of the ongoing war carried out in Ukraine, it is important to acknowledge the dynamics involved in war inside and through media channels acknowledging the role that media plays when reporting conflict events, i.e., critical observer, publicist, and constructor of strategies, tactics, and activities taken Thussu & Freedman (2012). On this behalf, Maathuis, Pieters & van den Berg (2018b) conduct an in-depth analysis of cyber operations carried out on different targets and multiple settings in Ukraine since 2014 and Vorbrugg & Bluwstein (2022) address the media attention to events happening in Ukraine acknowledging major events from 2014 and 2022, i.e., the annexation of Crimea and ongoing war, while further depicting media narratives and usual representations of Ukraine which tend to be single angled, e.g., the Euromaidan country, political divided civil society, and heroic freedom fighters. The authors further acknowledge the need to provide a place in current academic, practitioner, and media discourses to Ukrainian people for having a multi-angled and realistic perspectives of the ongoing events. This point directly resonates with the scope and motivation behind our research and article.

Furthermore, Agarwal, Punn & Sonbhadra (2022) analyze Twitter public sentiments before and during the start of the war, i.e., December 31, 2021 to March, 03, 2022. Al Assad, Spann & Agarwal (2021) execute a topic modelling analysis on Twitter for capturing and understanding climate changing and global warming important topics and surrounding discourses written by both human users as well as bots. The results obtained show that

82.5% believe that climate change is a human-made or anthropogenic issue while the percentage of the users who believe in global warming being of human causation is much lower. At the same time, the authors find clearly polarized views with politicians being cited and trolled in corresponding online discussions. Ibar-Alonso et al. (2022) investigate the sentiments around green energy on Twitter content surrounding the beginning of the war in Ukraine. The results obtained reveal that the ongoing conflict changed society's sentiments about energy transition to green energy. Moreover, Ngo et al., (2022) analyze the public sentiment of Facebook users from 109 countries in relation to the economic sanctions applied to Russia which reveal an increase of public condemnation against this conflict. The crucial ingredient for building such models is data. Accordingly, Höhn, Mauw & Asher (2022) propose a Telegram repository created by these authors with content in Russian and Belarussian languages covering the presidential elections in Belarus and the protests carried out in the country after the elections. Haq et al., (2022) provide a Twitter dataset from the first week of the conflict between Russia and Ukraine with over 1.6 million tweets for building analytical and predictive solutions for understanding existing cyber/information influence campaigns conducted on both sides. Along these lines, Fung & Ji (2022) propose a dataset with Twitter and Weibo content from the same period of time for further analytical purposes, and Chen, E., & Ferrara (2022) bring a rich dataset with over 63 million tweets between February 22, 2022, to March 8, 2022, for discourse analysis and social media manipulation detection solutions. Moreover, Park et al., (2022) propose a dataset starting from January 2021 up to May 2022 containing more than 21 million Russian social media posts and comments from Twitter and VKontakte (social platform seen as the Russian Facebook) for directly capturing discourses, topics, and corresponding Russian public sentiments. In this manner, Zhu et al., (2022) advance a dataset containing 300.000 posts and 9 million comments collectively from Reddit regarding military related discourses on the ongoing Russian-Ukrainian conflict.

Grounded on the studies above discussed, textual AI-based techniques show their potential when understanding public sentiments and extraction of relevant topics discussed in different social media narratives and discourses in general as well as in relation to the ongoing war in Ukraine. However, while research projects dedicated to social media platforms like Facebook and Twitter exist, limited attention and projects are dedicated to other social media platforms like Telegram. Hence, this is the knowledge gap identified and tackled in the present research focusing on the first six months of war in 2022.

3. Research Methodology

As this research aims at capturing topics and sentiments of Telegram Ukrainian speaking users by building a set of Machine Learning models and given the multidisciplinary nature of this research by merging AI, social media, and international relations domains, a Data Science approach is taken following the Design Science Research methodology (Shearer, 2000; Peffers et al., 2007; Peffers, Tuunanen & Niehaves, 2018; Maathuis, Pieters & van den Berg, 2018). Henceforward, the following research phases are involved:

In the first phase (Problem identification and aim definition), the problem to be investigated is established and its corresponding goal is defined. In these lines, seeing that Telegram is the most used social media platform in Ukraine and one of the most used ones in Russia during the ongoing war (Allyn, 2022), and the existing knowledge gap regarding the lack of discourse and sentiment analysis herein compared to other ones like Twitter and Facebook, this research aims to investigate discourses and sentiments of Ukrainian speakers in Telegram in the first six months of the ongoing conflict, i.e., since February 24, 2022 up to August 23, 2022.

In the second phase (Design and Development), the necessary data is collected, and corresponding discourse and sentiment analysis models are built. On this behalf, a series of ML-based models for multi-channel topic modelling and sentiment analysis are built and further presented in this research.

In the third phase (Evaluation and Communication), the results obtained are analysed and positioned in the ongoing discourses in a transparent and objective manner (Maathuis, 2022c). Moreover, the findings of this research are transmitted by means of this article and corresponding scientific presentations.

4. Dataset and Model Implementation

To achieve the aim of this research, data is collected from multiple Telegram channels between February 24, 2022, to August 23, 2022, i.e., the first six months of the ongoing war. The dataset contains 45897 unique messages with date and text body in Ukrainian. Accordingly, the translation is performed using the Google Translate API which uses different deep learning techniques such as natural language translation (Google Translate, 2022). Then the dataset goes through the data pre-processing phase where the duplicates,

punctuation, stop words (e.g., in, at) etc. are removed. Furthermore, Parts of Speech (PoS) tagging is applied for assigning a grammatical label corresponding to the grammatical function of the word in a sentence (e.g., verb, noun) and lemmatization is performed for shrinking words to their semantic root or base, i.e., lemma. Once the data is prepared, a series of Machine Learning models are built for analyzing the topics and sentiments of the users using topic modelling and sentiment analysis mechanisms.

In topic modelling, the underlying semantic structure of the text being analyzed is discovered by identifying and clustering the themes found as topics tackled (Zhao et al., 2021) which facilitates the interpretability and understanding of the core structure in the analyzed corresponding discourses (Blei & Lafferty, 2007). Herein, Non-negative Matrix Factorization with Kullback-Leibler Divergence algorithms are applied for shrinking the text analysed using a factor analysis method for issuing reduced weightage or significance for the less coherent words using the KL objective function (Lee & Seung, 2000; Blei, Ng & Jordan, 2003; Sokolova et al., 2016; Hien & Gillis, 2021). Accordingly, in Figure 1 are depicted segments of the implementation done for topic modelling.

```
for topic_idx, weights_per_word in enumerate(topic_word_matrix):
    top_word_indexes = weights_per_word.argsort()[:n_top_words - 1:-1]
    topic_words = [word_list[i] for i in top_word_indexes]
    weights = weights_per_word[top_word_indexes]

...

message_topic_matrix, topic_word_matrix = get_topic_matrixes_with_NMF(message_word_matrix, nmf)
assign_topics_to_messages(message_infos, message_topic_matrix)
topic_word_weight_matrix = get_topic_words_and_weights(topic_word_matrix,
                                                         word_list=word_list,
                                                         n_top_words=n_top_words)
```

Figure 1. Selection of topic modelling source code

In sentiment analysis, the underlying thoughts, opinions, attitudes, emotions, and feelings of users on different concepts, processes, systems, or events are captured and classified as being, e.g., objective or subjective, positive, neutral, or negative (Birjali, Kasri & Beni-Hssane, 2019; Ates, E. C., Bostanci, E., & Guzel, 2021). In this research, the sentiments are classified as positive and negative in respect to the topic and per day using the pre-trained classifier model and library Flair (Magajna, 2022). Correspondingly, Figure 2 illustrates segments of the implementation done for sentiment analysis.

```
if sentence.tag == 'POSITIVE':
    message_info.sentiment_score = sentence.score
else: # NEGATIVE
    message_info.sentiment_score = -1.0 * sentence.score

...

print('Starting sentiment analysis')
for message_info in message_infos:
    set_sentiment_score(message_info)
    count += 1
    show_progress(count)
print('\nFinished sentiment analysis')
```

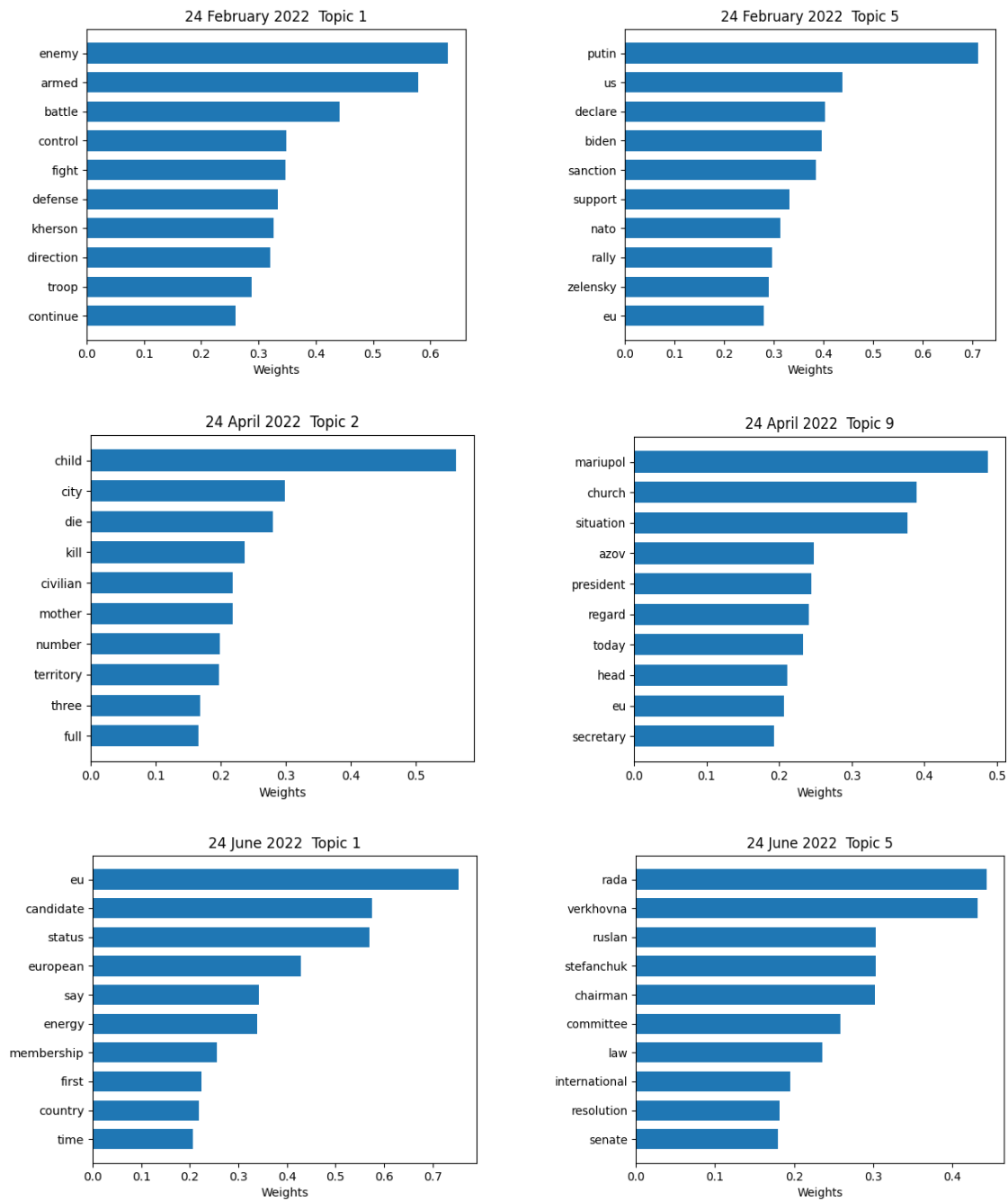
Figure 2. Selection of sentiment analysis source code

5. Results

In previous section implementation choices and particularities considered in this research are discussed. Hence, due to space constraints a random selection of the results obtained based on applying both topic modelling and sentiment analysis mechanisms and corresponding algorithms is further depicted considering 9 topics per day and 300 topics for the whole period of six months together with their corresponding sentiments. Accordingly, to show the progress and diversity of the topics discussed a selection is made from February 24, April, 24, June 24, and August 23 days and depicted in Figure 3.

Furthermore, corresponding sentiment scores with the count of messages per topics are computed and illustrated in Figure 4. Thenceforth, a selection of ten topics is captured from the entire period with nine words characterizing them together with their associated weights and sentiment scores plotted against the number of messages for showing the progress and diversity of the topics discussed. Moreover, the negative nature of the sentiment characterizing the whole period given the hardships experienced by Ukrainian people during this war is depicted in Figure 5. Accordingly, with dark blue are depicted the weights of words, with light blue is represented the number of messages, and with red are illustrated the sentiment scores. Conclusively, the

sentiment score per day is captured in Figure 6.



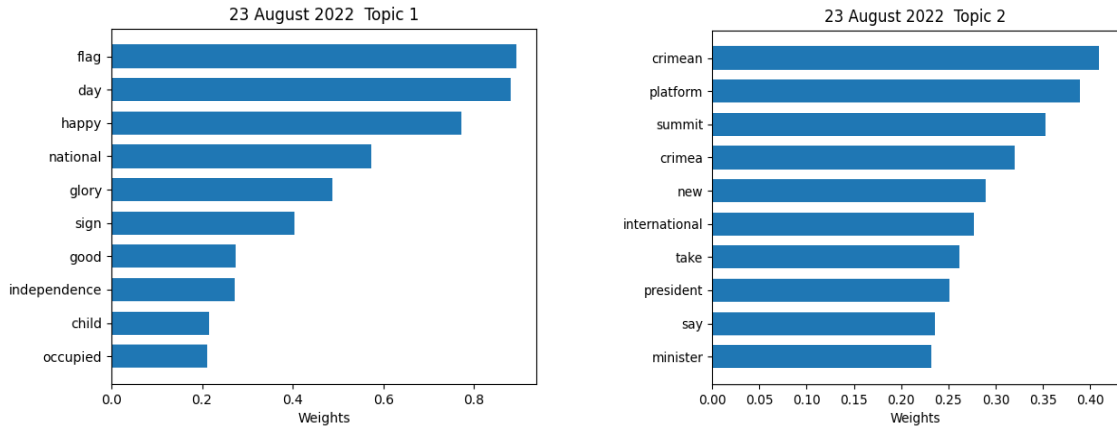


Figure 3. Topics discussed on February 24, April, 24, June 24, and August 23, 2022 (selection)

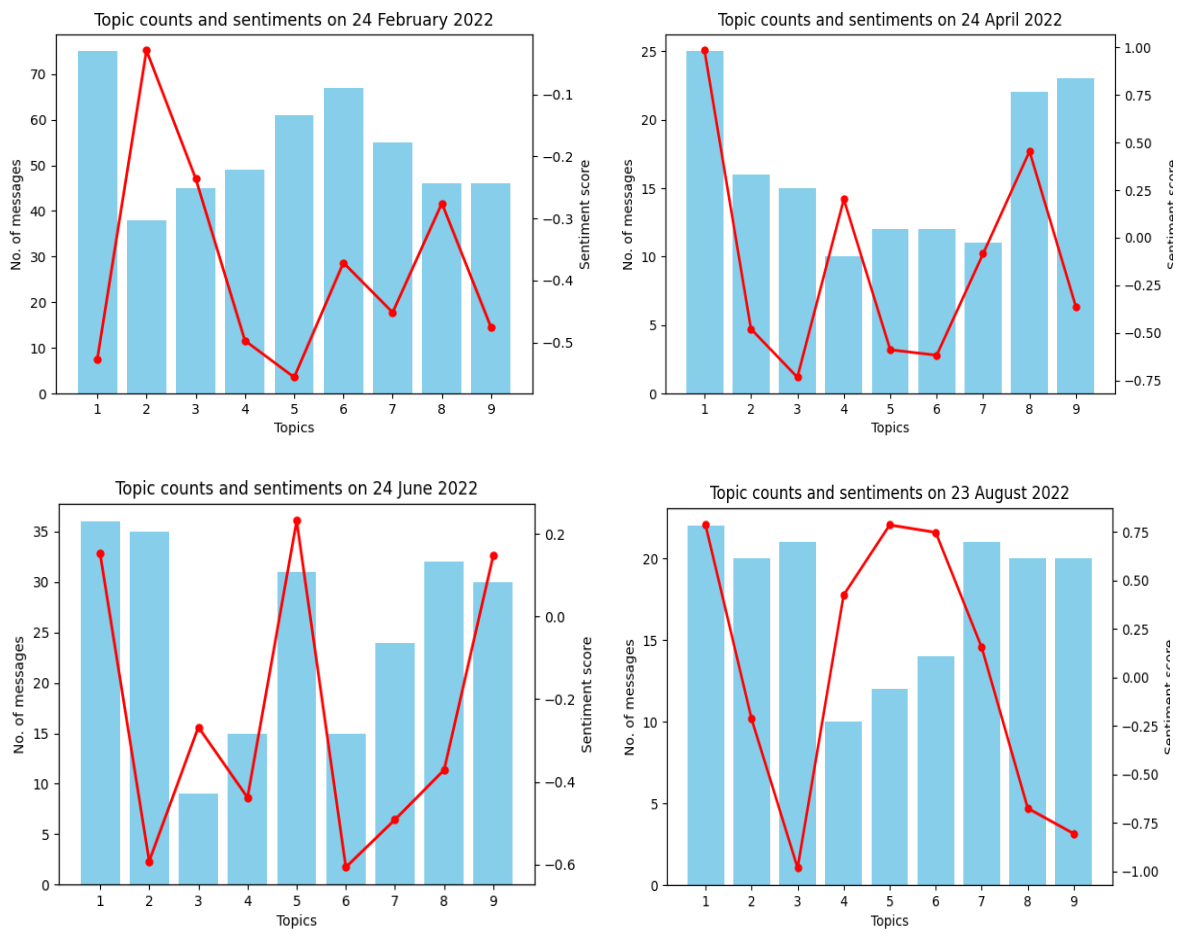
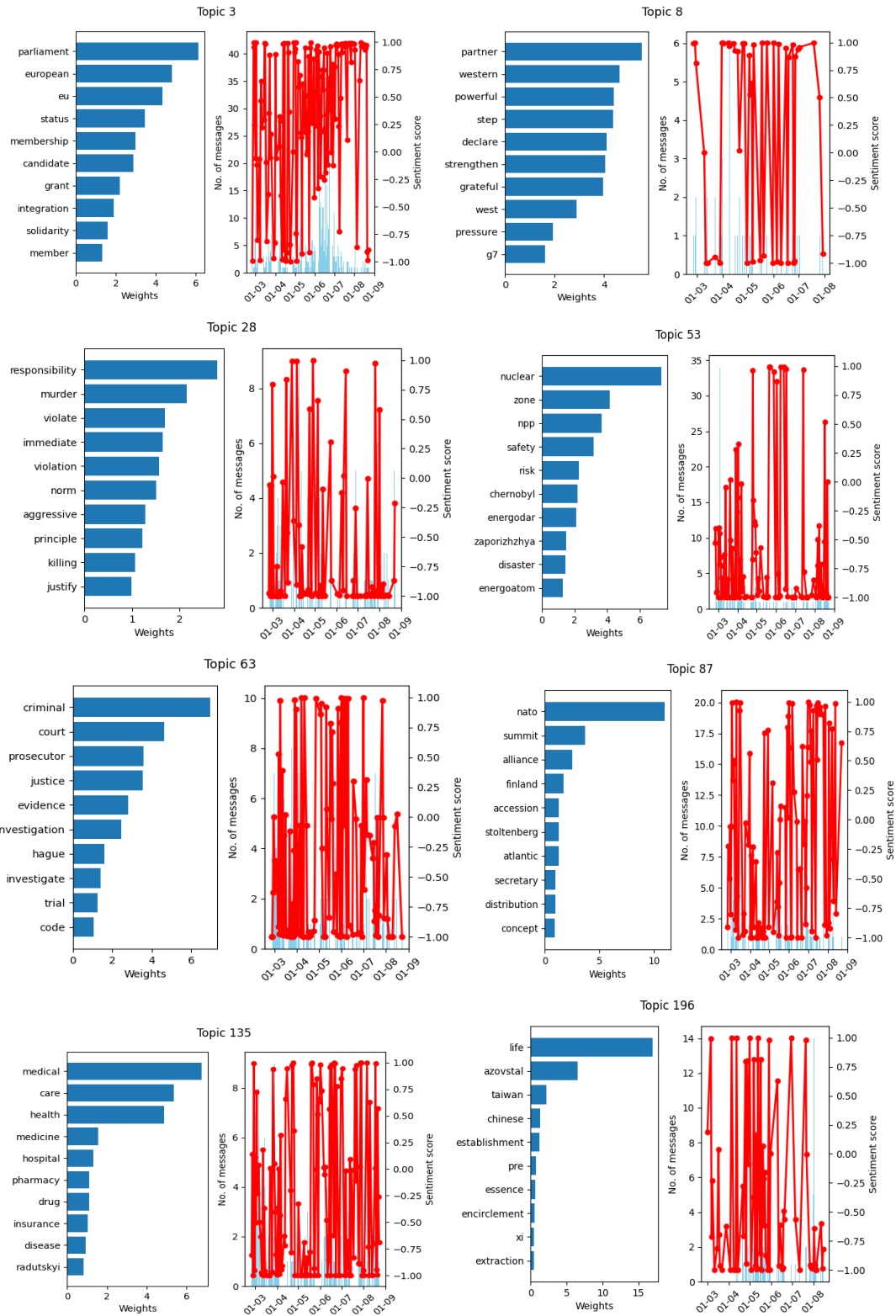


Figure 4. Topics count and sentiments for February 24, April, 24, June 24, and August 23, 2022



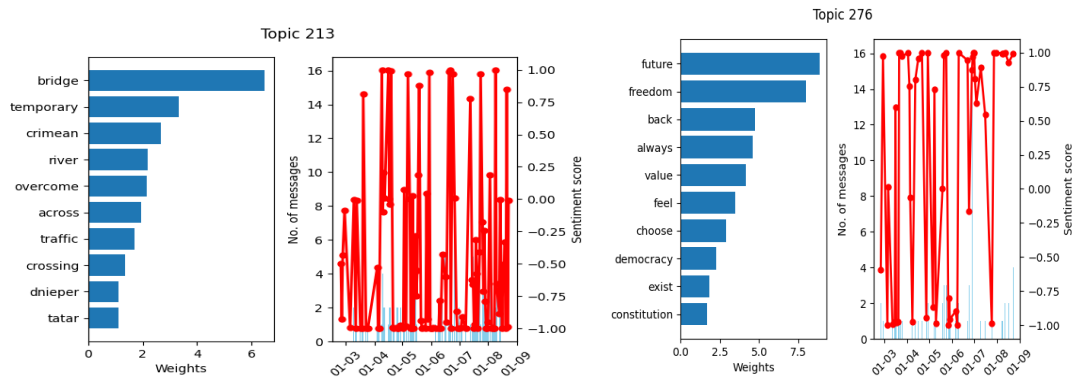


Figure 5. Selected topics for the entire analyzed period.

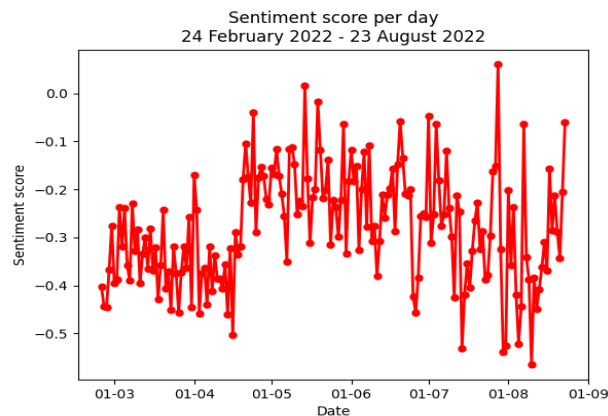


Figure 6. Sentiment score per day for the entire analyzed period.

Based on the approach taken and results obtained, topics like *armed*, *Zelensky*, *child*, *Mariupol*, *European*, *resolution*, *nuclear*, *investigation*, *NATO*, *hospital*, *establishment*, *Crimean*, and *freedom* are identified and it can be seen that they match former as well as ongoing news coming from different media channels, interviews with both subject matter experts, political representatives, and field population as well as academic researchers and practitioners trying to understand and be solitaire from different disciplines, angles, and roles through, e.g., refugees relocation to safe places as well as strategic, financial, and medical support dedicated to diverse plans and activities inside Ukraine (UN Secretary General, 2022; UNHCR, 2022; UN News, 2022; EU, 2022a; NATO, 2022; Levy & Leaning, 2022; Rawtani et al., 2022; Ben Hassen & El Bilali, 2022; Kammer et al., 2022; Marchese et al., 2022). In particular, the topics identified reveal the struggle of Ukrainian people going through these difficult moments and inside the general negative tendency, their corresponding sentiments vary in a way depending on the situation and moment in time as it can be seen for instance at the beginning of the conflict in February as well as a slight increase in positivity around EU candidacy in June and the Independence Day of Ukraine in August.

6. Conclusions

In social media, the information is built, encapsulated, and further transmitted as content through different discourses and narratives that can reach at incredible speeds global audiences. While the corresponding content may contain real aspects and facts characterizing the real world, cyber world, or both, it can also contain altered or manipulated (segments of) information that changes the sense of information as a virtue (Nakayama, 2022) and corresponding user behaviour, beliefs, and attitudes (Maathuis & Chockalingam, 2022) through social manipulation mechanisms like disinformation and misinformation which exploit both technical as well as human (un)known vulnerabilities (Tsao et al., 2021). These facts can be seen in the ongoing war carried out in Ukraine, which is pulled in more directions (Mbah & Wasum, 2022) through different visions, expectations, and tackling mechanisms, different strategies and corresponding means are used for engaging a broad range of targets through both physical and digital methods. Correspondingly, activities like manipulated textual narratives regarding stories such as the Kyiv Ghost, fake live streams from the field showing realistic hard footages that seemed real to produce audience deception, and deep fakes with the President Zelensky to influence population

behaviour (Stănescu, 2022). Hence, to be able to understand the events and perspectives in a realistic way and further building (intelligent) solutions for tackling and/or countering such social media manipulation mechanisms, data containing Ukrainian voices is needed (Vorbrugg & Bluwstein 2022), but, to the best of our knowledge, its presence is limited in both academic and practitioner discourses and corresponding approaches.

For tackling this knowledge gap, this article builds an AI-based solution as an artefact constructed using the Design Science Research methodology taking a Data Science approach by aiming at gathering and analysing multi-channel Telegram Ukrainian discourses carried out in the first six months of war by Ukrainian speakers. It does that by formulating two research questions. For the first question, research is conducted for designing and developing a data gathering, translating, and analysing solution for Ukrainian discourses. Accordingly, 45897 messages are collected, translated, processed, and analysed. For the second question, research is conducted for building a set of ML based models for automatically extracting topics discussed and corresponding sentiments of users. Correspondingly, topic modelling and sentiment analysis models are built, and a selection of topics extracted, and corresponding sentiment values are presented. While these findings match media discourses about the main events characterizing this conflict, they further support and contribute to (i) the need of building and proposing conflict-related datasets (Vorbrugg, A. B., & Bluwstein, 2022; Chockalingam & Maathuis, 2022), and (ii) building (intelligent) solutions for tackling/countering social manipulation mechanisms using AI, they reveal in an open and transparent way discourses and sentiments of Ukrainian users regarding aspects surrounding the ongoing war in Ukraine from its first six months, they can represent a basis for (i) a further multidisciplinary analysis where strategic, social, and psychological aspects could be scrutinized through multi-angle lenses and corresponding perspectives, and (ii) designing and implementing social media security awareness simulation gaming solutions encouraging diverse audiences for gathering/strengthening the stones necessary for building a safe, secure, and responsible digital environment.

References

- Agarwal, N. S., Pun, N. S., & Sonbhadra, S. K. (2022). Exploring Public Opinion Dynamics on the Verge of World War III using Russia-Ukraine war-Tweets Dataset.
- Agüero-Torales, M. M., Salas, J. I. A., & López-Herrera, A. G. (2021). Deep learning and multilingual sentiment analysis on social media data: An overview. *Applied Soft Computing*, 107, 107373.
- Al-Rawi, A., Kane, O., & Bizimana, A. J. (2021). Topic modelling of public Twitter discourses, part bot, part active human user, on climate change and global warming. *Journal of Environmental Media*, vol. 2, no. 1, pp. 31-53.
- Alassad, M., Spann, B., & Agarwal, N. (2021). Combining advanced computational social science and graph theoretic techniques to reveal adversarial information operations. *Information Processing & Management*, vol. 58, no. 1, pp. 102385.
- Allyn, B. (2022). Telegram is the app of choice in the war in Ukraine despite experts' privacy concerns. <https://www.npr.org/2022/03/14/1086483703/telegram-ukraine-war-russia>
- Ates, E. C., Bostanci, E., & Guzel, M. S. (2021). Machine Translation, Sentiment Analysis, Text Similarity, Topic Modelling, and Tweets: Understanding Social Media Usage Among Police and Gendarmerie Organizations. *arXiv preprint arXiv:2101.12717*.
- Ben Hassen, T., & El Bilali, H. (2022). Impacts of the Russia-Ukraine war on global food security: towards more sustainable and resilient food systems?. *Foods*, vol. 11, no. 15, pp. 2301.
- Birjali, M., Kasri, M., & Beni-Hssane, A. (2021). A comprehensive survey on sentiment analysis: Approaches, challenges and trends. *Knowledge-Based Systems*, 226, 107134.
- Blei, D. M., Ng, A. Y., & Jordan, M. I. (2003). Latent dirichlet allocation. *Journal of machine Learning research*, vol. 3(Jan), pp. 993-1022.
- Blei, D. M., & Lafferty, J. D. (2007). A correlated topic model of science. *The annals of applied statistics*, vol. 1, no. 1, pp. 17-35.
- Chen, E., & Ferrara, E. (2022). Tweets in time of conflict: A public dataset tracking the twitter discourse on the war between ukraine and russia. *arXiv preprint arXiv:2203.07488*.
- Chockalingam, S., & Maathuis, C. (2022). An Ontology for Effective Security Incident Management. In *International Conference on Cyber Warfare and Security*, vol. 17, no. 1, pp. 26-35.
- Cinelli, M., Conti, M., Finos, L., Grisolia, F., Novak, P. K., Peruzzi, A., ... & Quattrociocchi, W. (2019). (Mis) Information Operations. *Journal of Information Warfare*, vol. 18, no. (3), pp. 83-98.
- Dodonov, A. G., Lande, D. V., Tsyganok, V. V., Andriichuk, O. V., Kadenko, S. V., & Graivoronskaya, A. N. (2019). Information Operations Recognition: From Nonlinear Analysis to Decision-Making. *arXiv preprint arXiv:1901.10876*.
- European Union (2022a). The war in Ukraine and its implications for the EU. https://www.eeas.europa.eu/eeas/war-ukraine-and-its-implications-eu_en
- European Union (2022b). Grant EU candidate status to Ukraine and Moldova without delay, MEPs demand.
- Fung, Y. R., & Ji, H. (2022). A Weibo Dataset for the 2022 Russo-Ukrainian Crisis. *arXiv preprint arXiv:2203.05967*.
- Google Translate (2022). Language Support. <https://cloud.google.com/translate/docs/languages>

- Haq, E. U., Tyson, G., Lee, L. H., Braud, T., & Hui, P. (2022). Twitter dataset for 2022 russo-ukrainian crisis. *arXiv preprint arXiv:2203.02955*.
- Haroro J. I. (2015): The strategic logic of Islamic State information operations, Australian Journal of International Affairs.
- Hien, L. T. K., & Gillis, N. (2021). Algorithms for nonnegative matrix factorization with the Kullback–Leibler divergence. *Journal of Scientific Computing*, vol. 87, no. 3, pp. 1-32.
- Höhn, S., Mauw, S., & Asher, N. (2022). BelElect: A New Dataset for Bias Research from a “Dark” Platform. In *Proceedings of the International AAAI Conference on Web and Social Media*, vol. 16, pp. 1268-1274.
- Ibar-Alonso, R., Quiroga-García, R., & Arenas-Parra, M. (2022). Opinion Mining of Green Energy Sentiment: A Russia-Ukraine Conflict Analysis. *Mathematics*, vol. 10, no. 14, pp. 2532.
- Kammer, A., Azour, J., Selassie, A. A., Goldfajn, I., & Rhee, C. (2022). How war in Ukraine is reverberating across world’s regions. *Washington: IMF, March, 15, 2022*.
- Lee, D., & Seung, H. S. (2000). Algorithms for non-negative matrix factorization. *Advances in neural information processing systems*, 13.
- Levy, B. S., & Leaning, J. (2022). Russia’s War in Ukraine—The Devastation of Health and Human Rights. *New England Journal of Medicine*, vol. 387, no. 2, pp. 102-105.
- Maathuis, C., Pieters, W., & van den Berg, J. (2018). Developing a cyber operations computational ontology. *Journal of Information Warfare* 17(3), 32-49.
- Maathuis, C., Pieters, W., & van den Berg, J. (2018b). A knowledge-based model for assessing the effects of cyber warfare. In *Proceedings of the 12th NATO Conference on Operations Research and Analysis*.
- Maathuis, C., & Chockalingam, S. (2022). Responsible Digital Security Behaviour: Definition and Assessment Model. In *European Conference on Cyber Warfare and Security*, vol. 21, no. 1.
- Maathuis, C. (2022a). An Outlook of Digital Twins in Offensive Military Cyber Operations. ECIAIR 2022. In *European Conference on the Impact of Artificial Intelligence and Robotics*, vol. 4, no. 1.
- Maathuis, C. (2022b). On Explainable AI Solutions for Targeting in Cyber Military Operations. In *International Conference on Cyber Warfare and Security*, vol. 17, no. 1, pp. 166-175.
- Maathuis, C. (2022c). On the Road to Designing Responsible AI Systems in Military Cyber Operations. In *European Conference on Cyber Warfare and Security*, ol. 21, no. 1, pp. 170-177).
- Magajna, T. (2022). Natural Language Processing with Flair: a practical guide to understanding and solving NLP problems with Flair. Packt Publishing.
- Marchese, V., Formenti, B., Cocco, N., Russo, G., Testa, J., Castelli, F., & Mazzetti, M. (2022). Examining the pre-war health burden of Ukraine for prioritisation by European countries receiving Ukrainian refugees. *The Lancet Regional Health—Europe*, 15.
- Mbah, R. E., & Wasum, D. F. (2022). Russian-Ukraine 2022 War: A review of the economic impact of Russian-Ukraine crisis on the USA, UK, Canada, and Europe. *Advances in Social Sciences Research Journal*, vol. 9, no. 3, pp. 144-153.
- Nakayama, B. (2022). Democracies and the Future of Offensive (Cyber-Enabled) Information Operations. *The Cyber Defense Review*, vol. 7, no. 3, pp. 49-66.
- NATO (2022). NATO’s response to Russia’s invasion of Ukraine. https://www.nato.int/cps/en/natohq/topics_192648.htm
- Ngo, V. M., Huynh, T. L., Nguyen, P. V., & Nguyen, H. H. (2022). *Public sentiment towards economic sanctions in the Russia-Ukraine war* (No. 1108). Global Labor Organization (GLO).
- NPR (2022). Telegram is the app of choice in the war in Ukraine despite experts’ privacy concerns. <https://www.npr.org/2022/03/14/1086483703/telegram-ukraine-war-russia>
- Park, C. Y., Mendelsohn, J., Field, A., & Tsvetkov, Y. (2022). VoynaSlov: A Data Set of Russian Social Media Activity during the 2022 Ukraine-Russia War. *arXiv preprint arXiv:2205.12382*.
- Peffer, K., Tuunanen, T., Rothenberger, M. A., & Chatterjee, S. (2007). A design science research methodology for information systems research. *Journal of management information systems*, vol. 24, no. 3, pp. 45-77.
- Peffer, K., Tuunanen, T., & Niehaves, B. (2018). Design science research genres: introduction to the special issue on exemplars and criteria for applicable design science research.
- Rawtani, D., Gupta, G., Khatri, N., Rao, P. K., & Hussain, C. M. (2022). Environmental damages due to war in Ukraine: A perspective. *Science of The Total Environment*, 850, pp. 157932.
- Shearer, C. (2000). The CRISP-DM model: the new blueprint for data mining. *Journal of data warehousing*, 5(4), 13-22.
- Sokolova, M., Huang, K., Matwin, S., Ramisch, J., Sazonova, V., Black, R., ... & Sambuli, N. (2016). Topic modelling and event identification from Twitter textual data. *arXiv preprint arXiv:1608.02519*.
- Stănescu, G. (2022). Ukraine conflict: the challenge of informational war.
- Thussu, D. K., & Freedman, D. (Eds.). (2012). *War and the media: Reporting conflict 24/7*. Sage.
- Tsao, S. F., Chen, H., Tisseverasinghe, T., Yang, Y., Li, L., & Butt, Z. A. (2021). What social media told us in the time of COVID-19: a scoping review. *The Lancet Digital Health*, vol. 3, no. 3, pp. 175-194.
- United Nations News (2022). Ukraine. <https://news.un.org/en/focus/ukraine>
- United Nations Secretary General (2022). Statement by the Secretary General-on Ukraine. <https://www.un.org/sg/en/content/sg/statement/2022-02-24/statement-the-secretary-general-%E2%80%93-ukraine>
- United Nations Refugee Agency (2022) Statement of the situation in Ukraine attributed to UN High Commissioner or refugees Filippo Grandi. <https://www.unhcr.org/news/press/2022/2/621770524/statement-situation-ukraine-attributed-un-high-commissioner-refugees-filippo.html>

- Vorbrugg, A. B., & Bluwstein, J. (2022). Making sense of (the Russian war in) Ukraine: On the politics of knowledge and expertise. *Political geography*, 102700.
- Waissbluth, E., Farid, H., Sehgal, V., Peshin, A., & Afroz, S. (2022). Domain-Level Detection and Disruption of Disinformation. *arXiv preprint arXiv:2205.03338*.
- Zhao, H., Phung, D., Huynh, V., Jin, Y., Du, L., & Buntine, W. (2021). Topic modelling meets deep neural networks: A survey. *arXiv preprint arXiv:2103.00498*.
- Zhu, Y., Haq, E. U., Lee, L. H., Tyson, G., & Hui, P. (2022). A Reddit Dataset for the Russo-Ukrainian Conflict in 2022. *arXiv preprint arXiv:2206.05107*.

Understanding the Motivations for SMEs in South Africa to Adopt Social Media

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Abstract: Since the covid-19 pandemic in 2020, many businesses have relied on social media to stay abreast with the latest news, developments and to predict the future world of business. Many countries around the world instigated lockdown restrictions to curb the spread of the covid-19 virus, and social media platforms were very popular tools used for spreading the news. The proliferation of social media has also increasingly drawn the attention of Small and Medium Enterprises (SMEs) in South Africa to improve their efforts of sustaining their businesses. Social media platforms have become popular in the business environments for their ability to increase market reach, transfer knowledge, and sustain the business. While many benefits of social media to enhance business performance have been studied, there are also skeptics on data privacy issues that social media brings to the business. In the SME sectors in South Africa, social media are adopted due to their cost effectiveness and ease of use. However, little is known about the effect of data privacy issues on SME business performance. The literature of social media adoption indicates that the older generation of SME owners are skeptical about sharing their confidential business insight on social media platforms. This is despite the availability of many other literature studies that report on the increase of social media studies to enhance business sustainability. This study aims to produce knowledge for understanding the key motivations of SMEs to adopting social media despite the existence of data privacy issues on social media. Qualitative interviews were conducted with 13 SME entrepreneurs who were purposively selected based on their knowledge of social media, experience of its application in the business, industries and premises of the SME business in South Africa. The results of the interviews indicated that SMEs are generally aware of the data privacy issues surrounding the use of social media, and the adoption rate differs from younger and older generation of SME entrepreneurs.

Key words: Social Media; Data privacy, Small and Medium Enterprises

1. Introduction and background

The Covid-19 pandemic has devastated many economic activities globally. The first Covid-19 case was reported in China in the year 2019 (Kuckertz and Brändle, 2022). Subsequently, the virus quickly spread many parts of the world. Many countries implemented lockdown regulations to curb the spread of the virus. As a result, the Small and Mediums Enterprises (SME) were mostly affected by lockdown regulations and had to device means of remaining in sustainable, despite having limited finances and resources (Fubah and Moos 2022). Recently, studies paid particular attention to digital technologies that have a potential to enable SMEs to cope with effects of the Covid-19 pandemic (Gregurec, Tomičić Furjan and Tomičić-Pupek, 2021). In particular, studies focused on social media platforms as rapidly growing digital communication platforms which continue to attract SMEs (Sedalo, Boateng and Kosiba, 2022).

Although social media seems to be ideal digital communication platforms for SME businesses, studies show the lack of evidence for measuring the effectiveness of social media on SME performance (Mamorobela, 2021). Social media platform are diverse and SMEs need to identify those that are aligned to their performance expectations to achieve success (Hanafizadeh, Shafia and Bohlin, 2021). This is because social media platforms are also criticised for failing to protect data privacy (Safi, Movaghar and Ghorbani, 2022). Rathore et al (2017) argues that social media service providers are the biggest violators of data privacy. Thus this paper seeks to understand the motivations for SMEs in South Africa to adopt social media, despite the issues of data privacy. The paper is structure into seven main sections, namely, the introduction and background in section one, the research problem in section two, the research questions in section three, the literature review in section four; the research methodology in section five, the results of the study in section six, and the implications and recommendation for future research in section seven.

2. Research problem

With the growing number of literature reporting on the adoption of social media in SMEs, there are still sceptics surrounding its use in some parts of the business. In particular, data privacy on social media has become the biggest reason for concern because social media platforms are criticised for failing to provide secure data privacy mechanisms (Persia and D'Auria, 2017). It is from this perspective that this study was undertaken to understand the key motivations of SMEs to adopt social media despite the data privacy issues associated with the platforms. The study seeks to produce useful knowledge for academics and practitioners to advance research in social media studies and their applications in the SME environments.

3. Research questions

This study aims to address the following research questions:

- (i) What are the determinants of using social media to sustain the SME businesses?
- (ii) How do SMEs address the data privacy issues of social media?

4. Literature review

The literature review section starts by presenting the overview of SMEs in South Africa, followed by the use of social media during and post Covid-19, the determinants of social media use, and the data privacy mechanisms on social media.

4.1. Overview of the Small and Medium Enterprises (SMEs) in South Africa

In South Africa, SMEs are defined as private business entities with one or more owners who are responsible for both business strategy and operations (Goldstuck, 2014). They employ between one and 200 staff, and make an annual turnover of R500K to R5m (DNT, 2017). Studies report that the SME business in South Africa creates well over 50 percent job opportunities for the youth and the unemployed, and about 34 percent contribution to the Gross Domestic Product (GDP) of the country (Rajagopaul, Magwentshu and Kalidas, 2020). Moreover, 95 percent of private businesses in South Africa are classified in the category of SMEs. However, the SMEs in South Africa lack resources to sustain themselves and are often the least resilient at the time of economic crisis like Covid-19 pandemic.

Recently, challenges of the SMEs in South Africa mounted even more when the government implemented Covid-19 lock down regulations to contain the virus (De Villiers, Cerbone and Van Zijl, 2020). The lockdown regulations resulted in many SMEs having to explore low cost technologies like social media to be able to engage with their clients digitally to continue with business, despite facing covid-19 challenges.

4.2. The use of social media during and post Covid-19 pandemic

Social media is commonly defined as “all the devices and platforms that allow users globally to virtually create and share information with each other” (Brooks and Gupta, 2013). The term devices in this case refer to all computing technologies, and the term platforms refers to all virtual environments where users connect to exchange information using the devices. Social media was first coined in the early 2000s as a technology that allows people who connect on the internet to create and manipulate their own content (Tsiakali, 2018). During the Covid-19 pandemic, social media platforms have been used extensively by SMEs to communicate and collaborate digitally (Sedalo et al, 2022). Covid-19 is defined as a deadly virus caused by a coronavirus known as SARS-CoV-2 (WHO, 2020).

Covid-19 left a devastating effect on the SME businesses in South Africa. Regular lockdown restriction were implemented by the South African government to contain the virus from spreading. This resulted in many SMEs losing revenue as they could not conduct their businesses during lockdown (Rajagopaul et al, 2020). The availability of low cost social media platforms come to the rescue for many SMEs in South Africa. Many SMEs used social media for communication, marketing and collaborating with others digitally, despite facing covid-19 challenges. This business phenomenon gave rise to the concept of cyber entrepreneurship.

Cyber entrepreneurship is a business phenomenon that enables entrepreneurs to conduct business on virtual environments (Tajvidi and Tajvidi, 2020). The phenomenon encourages SME entrepreneurs to leverage digital technology to become competitive. Undoubtedly, SMEs are quick to adopt cyber entrepreneurship due to their flexibility in how they execute their business strategies and operations. As such, many SMEs in South Africa are using social media technologies as part of their cyber entrepreneurship to cope with the effects of the Covid-19 pandemic. Several studies show that a growing number of SMEs use social media since the year 2020 when Covid-19 started (Sedalo et al, 2022; Gregurec et al, 2021). The determinants of social media use were also studied in some literature.

4.3. Determinants of social media use in SMEs

The use of social media in SMEs is associated with several factors which have a potential to improve business performance. For example, Ainin et al (2015) suggests that the compatibility, low cost, and interactivity factors of facebook allows SMEs to reduce costs of marketing, information accessibility, customer service, and customer relations. Wamba and Carter (2016) discovered that factors like innovativeness, size of the SME, age of the owner, and the industry sector contribute to the adoption of social media by SMEs. Mamorobela and Buckley (2019) suggests that organisational factors like management style, limited access to finance, communication channel; and technological factors like sharing, reputation, relationships, and target audience are crucial for social media strategies to be a success. Jokonya and Mugisha (2019) suggests that low cost, connectivity, and relationships are the technology factors; management support, operational support, and technical support are the organisational factors; and competition and external support are the environmental factors that play a big role for SMEs in the retail sector to improve performance.

While studies on social media determinants are growing, the critics of social media's inability to protect user's private data are brewing (Safi et al, 2022). Data privacy and information security are a huge concern for businesses. Many are losing a large portion of their financial investments due to data mismanagement. IBM (2022) reports that over 45% of data breaches are a result of stolen user credentials on cloud based technologies like social media platforms.

4.4. Data privacy mechanisms on Social Media

The South African government enforced data security policies on businesses that deal with personal information. Regulations like the Protection of Personal Information Act (POPIA) are in place to ensure that organisations do not misuse people's personal data (POPIA, 2022). Due to the large volumes of personal data being shared on social media, there is a growing interest on data privacy mechanisms applied on different social media platforms (Safi et al, 2022). Since social media are deployed on the internet, it is the responsibility of the social media service providers to ensure that there is no violation of data privacy. Studies report that social media service providers often violate data privacy due to their inability to strengthen data privacy mechanisms on their social media platforms (Persia and D'Auria, 2017).

Various data privacy schemes for social media have been proposed in literature. For example, Yang and Jia (2013) proposes a data privacy scheme that uses multi-authority attribute-based access control in the cloud. Jung et al (2014) proposed a semi-anonymity access control with full anonymous access-based encryption for cloud environments to protect both the data privacy and the privacy of people's identities. Yang et al (2016) proposed a secure cloud data sharing scheme using the end-to-end ciphertext-policy attribute-based encryption (CP-ABE) which is built on the conditional proxy re-encryption (CPRE). Li et al (2017) proposed a lightweight secure data sharing scheme for mobile cloud processing that uses CP-ABE to control access from the external proxy servers, transferring the majority of computational load from mobile devices. Fugkeaw and Sato (2018) proposed a special access control model based on combining CP-ABE and role-based access control (RBAC) to produce an effective key update function in data outsourcing environments. Schillinger and Schindelbauer (2019) proposed an end-to-end encryption method that uses public key Rivest-Shamir-Adleman (RSA) encryption as well as advanced encryption standard (AES) symmetric key encryption algorithm for online messaging and chat services on social networking sites. Abdulla and Bakiras (2019) proposed a flexible system based on encryption-based access control that provides security and privacy for users named as hide in the crowd (HITC) to allow users to decrypt the data they post on social networking platforms based on access control with appropriate granularity levels. Yang et al (2020) proposed a hierarchical blockchain-based approach and CP-ABE scheme for social media privacy that provides users with a choice of fine-grained features along with protecting their data on semi-hosted servers in social networking. Zhang et al (2021) proposed a blockchain-based privacy-preserving framework for online social networking platforms which uses hybrid blockchain and public-key encryption to prevent damages to the privacy of users and to provide social networking users with security in sharing, retrieving, and accessing data. Li, Zhu and Fu (2022) proposed an intelligent privacy protection for online social networking users to protect the privacy of the location and the trajectory of users who use social networking platforms for educational purposes. Safi et al (2022) proposed a data encryption scheme for mobile social networking that enhanced data security in an end-to-end manner.

Given the abundance of literature reporting on social media determinants and data privacy mechanisms, this study seeks to produce knowledge for understanding the key motivations of SMEs for adopting social media, despite issues of data privacy. To enable an in-depth understanding of a phenomenon, the study followed the

qualitative methodological procedures that are inductive in nature and focus on subjectivity and different perspectives of SME entrepreneurs.

5. Research methodology

Research needs to follow a rigorous methodological process to achieve more realistic results. Creswell and Creswell (2018) distinguishes between three research approaches that are commonly used in social science research, namely the qualitative, quantitative, and mixed methods approach. The qualitative approach focuses on the subjective and sensitive insights to understand reality, and the quantitative approach understands reality by being objective and focusing on statistical facts, hard data, and tangible evidence. The mixed methods approach combines both qualitative and quantitative approaches in one study to provide a holistic understanding of the phenomenon (Rahman, 2020). Scholars need to identify the domain of the study to produce more realistic results (Fetters & Molina-Azorin, 2019). Although the mixed methods approach sound ideal for producing a holistic knowledge of the phenomenon, it is very cumbersome and time consuming (Mamorobela, 2022).

The qualitative approach was more relevant for this study to ascertain the perceptions of SME entrepreneurs on their motivations for adopting social media despite the data privacy issues associated with the platforms. Open-ended interviews were conducted with 13 SME entrepreneurs who were purposively selected based on their age groups, knowledge of social media, and the application of social media in their respective businesses. The age groups were distributed between the young generation who are younger than 50 years of age and the older generation who are 50 and above years of age. In particular, the maximum variance purposive sample technique was applied due to its ability to identify samples that have a potential to provide rich and different perspectives to strengthen the research (Creswell and Creswell, 2018).

The interviews were recorded digitally using an audio recorder and transcribed for analysis on Atlas.ti version 22. The data was analysed using the five step thematic analysis process suggested by Archer et al (2017). The steps include, (1) text familiarisation where each interview data was transcribed and cleaned to ensure confidentiality by allocating fictitious names instead of the real names of the SMEs and the respondents, (2) coding of data in the transcripts on Atlas.ti and generation of the codebook, (3) revision of the codes to check for repetitions and similarities in the codes, (4) creation of themes by grouping the codes that address the same research questions, and (5) revision of the final themes to check and correct existing repetitions and similarities in the themes.

6. Research findings and discussions

The thematic analysis process was guided by research questions of the study. The analysis process resulted in two primary themes being addressed and synthesised with the literature.

(i) Theme 1: Determinants of using social media in SMEs

The respondents were asked questions relating to the determinants of using social media in their organisations to ascertain their motivations for using social media. It was discovered that social media affords SMEs the ability to market their businesses even to markets were ordinarily out of reach for them due to their limited resources. These sentiments were expressed as follows:

'Well the effectiveness is the instant reach that one can have. So you have a high number of people on social media that you can reach instantly, so that you can clarify issues as quickly as possible...' [respondent 1]

'We sort of selected those platforms because of the number of people that will find in those platforms. Because of that, we then decided to say, look, is it worth it to share what we are doing on social media, but also we believe that the business that we are in is more attractive to young people. And the young people are the people that today you'll find in the social media platforms. So then it makes sense for us to share our stories there, in that sense, we also attract people to watch what we're doing. But also we sort of share the direction that as a company we're taking and in one way or the other then contribute towards knowledge of understanding that this is possible. It can be done in South Africa (sic)' [respondent 3].

'...So it makes it easier for us as SMEs in the print industry to utilise it as another output tool that can present information to a large audience in a simplified manner' [respondent 11].

'We do a lot of international calls and the like, so Skype works for us a lot, others like Facebook, WhatsApp, etc. we just use on an ad-hoc basis. I see a lot of young stars engaging on these platforms more than us because we are slow to catch-up, hahaha' [respondent 13]

Odoom et al (2017) also attests to these sentiments and add that SMEs in emerging markets continue are even conducting their marketing campaigns on social media platforms. Indeed, connectivity and interactivity of social media are part of the determinants of its use, especially in the times of covid-19 pandemic. A view on connectivity was shared by the respondents as follows:

'One of the things that we do a lot is most of our meetings, are online meetings because we've got clients in the USA, because of where they are, or even in GAUTENG because of traffic, we will typically either use Skype, or our preferred one is either use Zoom quite a lot, okay, Because then we can record the meetings and then get back to it, we also use the Hangouts a lot' [respondent 4].

'People tend to focus quickly, because they're looking at the time, because its scheduled, say about 30 minutes to one hour, and they want to make sure that the time is used profitably... And you'll find that typically, even the meeting that's scheduled for an hour, now turns out to be 30 minutes - 45 minutes' [respondent 10].

It was interesting to discover that there is a direct compatibility between social media and the business processes of SMEs. These views were shared by respondents as follows:

'That is the main tool today, probably the main that is easily affordable, okay, especially for us SMEs. Because if we were to look at someone say why don't you use your television or other platforms, but those ones then you need to pay and as an SME, then you find it difficult to that. So, Social Media becomes the best option in that sense that you can then be able to utilise it, in the manner that it benefits your organisation' [respondent 3]

'... in the process of that discussion we then use the tools within those online services, yes to either share information, capture it online, then later we then compile it, okay. To make sense of it, but because that's the business we're in in terms of managing data, social media is compatible in that sense' [respondent 4]

'Like 60% of our meetings are over Skype and Zoom and then everything else is over the telephone and we are able to meet our service levels with our clients accordingly' [respondent 8]

Evidently, the determinants of social media use are perceived to serve as motivations for SME entrepreneurs to adopt the platforms. The issue of data privacy on social media was also discussed in-depth by the SME entrepreneurs to address theme 2 of the study.

(ii) Theme 2: Social media's data privacy issues

Safety-sensitive behaviour of SME entrepreneurs in different age groups were investigated to ascertain their perceptions on data privacy mechanisms of social media. The research respondents were asked questions regarding their data privacy requirements to ascertain if the existing social media platforms are capable to cater for such requirements. They expressed their views as follows:

'I'm very sceptical on LinkedIn. It's a lot of people connected to each other every day. But I don't see how those conditions get used in business. A lot of companies now especially SMEs, they you flooding LinkedIn, with marketing messages, about their products. They're being sent to the world. How much of that world is interested in what that company does?' [respondent 2]

'My first email address was a dot alt as it was called those days. One of probably 20,000 on the planet. So I've grown up with the technology. So the first question is what is defined to social media? And in these days is publications like Facebook, LinkedIn and various platforms, Instagram, All the rest of the collaboration. Yeah, it was systems that I use, because I find the machine useful business. Facebook is interesting that is now it started after the social media platform. A lot of companies now have the corporate websites on Facebook. Yeah, absolutely. But do have a formal old fashioned website aswell' [respondent 6].

'If you want an old fart opinion! And I've seen it many times over 30 years of working on the IT game, the modern wave is very easy to try and subdues the old way. Yeah, so email is old, is legacy, why use it? Yeah. Most of the business platforms are Email based. And modern social media platforms cannot replace. I've just picked up a new project. I need to have a contract. How do we discuss that contract? We discuss it on Email. We also use Skype' [respondent 13]

Evidently, there is a lot of scepticism from senior SME entrepreneurs on the use of social media for business. Despite the existing literature on data privacy mechanisms available for social media platforms, the elderly SME entrepreneurs are still very slow adopters of social media platforms and usually find it difficult to trust such platforms with their business sensitive data.

7. Implications and recommendations

The results of the study has implications on scholars who advance research on social media to understand issues affecting different age groups of SME entrepreneurs, and to provide generic mechanisms for social media adoption by SME entrepreneurs of all age groups. The study has practical implication on SME entrepreneurs to identify social media platforms that are compatible to their SME operations. In particular, future studies can develop models for understanding the determinants of social media use and offer practical guideline to measure the effectiveness of social media for SMEs.

8. Conclusions

This study discovered that different age groups of SME entrepreneurs have different views on the adoption and use of social media platforms. The young generation are very quick to adopt social media platforms to share marketing content and derive new knowledge by networking with others. However, the elderly generation of SME entrepreneurs are very sceptical to conduct their business on social media mostly because they don't trust the platforms with their company's sensitive data. This study presents a gap in literature for future studies to develop models of social media adoption to be applied generally by SMEs entrepreneurs of all ages.

References

- Abdulla, A.K. and Bakiras, S. (2019) "HITC: Data privacy in online social networks with fine-grained access control", In *Proceedings of the 24th ACM symposium on access control models and technologies*, pp. 123-134.
- Ainin, S., Parveen, F., Moghavvemi, S., Jaafar, N.I. and Shuib, N.L.M. (2015) "Factors influencing the use of social media by SMEs and its performance outcomes", *Industrial Management and Data Systems*, Vol 115, No. 3, pp.570-588.
- Brooks, H. and Gupta, R. (2013) *Using social media for global security*. John Wiley and Sons.
- Creswell, J.W., and Creswell, J. D. (2018) "The selection of a Research Approach", In J.W. Creswell and J.D. Creswell (Eds). *Research design: quantitative, qualitative, and mixed methods approaches*. Fifth edition, Los Angeles: SAGE
- De Villiers, C., Cerbone, D. and Van Zijl, W. (2020) "The South African government's response to COVID-19", *Journal of Public Budgeting, Accounting and Financial Management*.
- DNT (2017). *An overview of SMMs in South Africa: An analysis of the National Small Business Act. 2017. Annual Report*. Pretoria. South African department of national treasury
- Fetters, M.D. and Molina-Azorin, J.F. (2019) "A call for expanding philosophical perspectives to create a more "worldly" field of mixed methods: The example of Yiyang philosophy. *Journal of Mixed Methods Research*, Vol. 13, No. 1, pp.15-18.
- Fubah, C.N. and Moos, M. (2022) "Exploring COVID-19 Challenges and Coping Mechanisms for SMEs in the South African Entrepreneurial Ecosystem", *Sustainability*, Vol. 14, No. 4, p.1944.
- Fugkeaw, S. and Sato, H. (2018) "Enabling dynamic and efficient data access control in cloud computing based on attribute certificate management and CP-ABE", In *2018 26th Euromicro International Conference on Parallel, Distributed and Network-based Processing (PDP)*, pp. 454-461. IEEE.
- Goldstuck A. (2014) *SME Survey: Executive Summary*. South Africa. World Wide Worx.
- Gregurec, I., Tomičić Furjan, M. and Tomičić-Pupek, K. (2021) "The impact of COVID-19 on sustainable business models in SMEs", *Sustainability*, Vol. 13, No. 3, p.1098.
- Hanafizadeh, P., Shafia, S. and Bohlin, E. (2021) "Exploring the consequence of social media usage on firm performance", *Digital Business*, Vol. 1, No. 2, p.100013.
- IBM (2022) "Cost of a Data Breach Report 2022", IBM [online] <https://www.key4biz.it/wp-content/uploads/2022/07/Cost-of-a-Data-Breach-Full-Report-2022.pdf> (Accessed 11 December,, 2022)
- Jokonya, O. and Mugisha, C. (2019) "Factors influencing retail SMEs adoption of social media for digital marketing". In *ECSM 2019 6th European Conference on Social Media* (p. 145). Academic Conferences and publishing limited.
- Jung, T., Li, X.Y., Wan, Z. and Wan, M. (2014) "Control cloud data access privilege and anonymity with fully anonymous attribute-based encryption", *IEEE transactions on information forensics and security*, Vol. 10, No. 1, pp.190-199.
- Kuckertz, A. and Brändle, L. (2022) "Creative reconstruction: A structured literature review of the early empirical research on the COVID-19 crisis and entrepreneurship", *Management Review Quarterly*, Vol. 72, No. 2, pp.281-307.
- Li, R., Shen, C., He, H., Gu, X., Xu, Z. and Xu, C.Z. (2017) "A lightweight secure data sharing scheme for mobile cloud computing" *IEEE Transactions on Cloud Computing*, Vol. 6, No. 2, pp.344-357.
- Li, Y., Zhu, J. and Fu, W. (2022) "Intelligent Privacy Protection of End User in Long Distance Education", *Mobile Networks and Applications*, pp.1-12.

- Mamorobela, S.P. (2021) "Evaluating the effectiveness of social media on knowledge management systems of small, medium and micro enterprises in South Africa", Doctoral dissertation, University of South Africa.
- Mamorobela, S.P. (2022) "Understanding a Social Media-Enabled Knowledge Management Adoption Model for Small and Medium Enterprises in South Africa: An Explanatory Sequential Mixed Methods Research Design Study", In *Handbook of Research on Mixed Methods Research in Information Science* (pp. 324-339). IGI Global.
- Mamorobela, S. and Buckley, S. (2019) "Factors Influencing Adoption of Social Media Strategies by SMMEs in South Africa", In *ECSM 2019 6th European Conference on Social Media* (p. 334). Academic Conferences and publishing limited.
- Odoom, R., Anning-Dorson, T. and Acheampong, G. (2017) "Antecedents of social media usage and performance benefits in small- and medium-sized enterprises (SMEs)", *Journal of Enterprise Information Management*, Vol. 30, No. 3, pp.383–399.
- Persia, F. and D'Auria, D. (2017) "A survey of online social networks: challenges and opportunities". In *2017 IEEE international conference on information reuse and integration (IRI)*, pp. 614-620. IEEE.
- POPIA (2022) "Protection of Personal Information Act (POPI Act)", POPIA, [online] <https://popia.co.za/> (accessed 06 December, 2022)
- Rahman, M.S. (2020) "The advantages and disadvantages of using qualitative and quantitative approaches and methods in language "testing and assessment" research: A literature review", *Journal of Education and Learning*, Vol. 6, No. 1, pp.102-112
- Rajagopaul, A., Magwentshu, N. and Kalidas, S. (2020) "How South African SMEs can survive and thrive post COVID-19". Providing the Right Support to Enable SME Growth Now and Beyond the Crisis.
- Rathore, S., Sharma, P.K., Loia, V., Jeong, Y.S. and Park, J.H. (2017) "Social network security: Issues, challenges, threats, and solutions", *Information sciences*, Vol. 421, pp.43-69.
- Safi, S.M., Movaghar, A. and Ghorbani, M. (2022) "Privacy Protection Scheme for Mobile Social Network", *Journal of King Saud University-Computer and Information Sciences*, Vol. 34, pp. 4062-4074.
- Schillinger, F. and Schindelbauer, C. (2019) "End-to-end encryption schemes for online social networks", In *International Conference on Security, Privacy and Anonymity in Computation, Communication and Storage*, pp. 133-146. Springer, Cham.
- Sedalo, G., Boateng, H. and Kosiba, J.P. (2022) "Exploring social media affordance in relationship marketing practices in SMEs", *Digital Business*, Vol. 2, No. 1, p.100017.
- Tajvidi, R. and Tajvidi, M. (2020) "The growth of cyber entrepreneurship in the food industry: Virtual community engagement in the COVID-19 era", *British Food Journal*, Vol. 123, No. 10, pp.3309-3325.
- Tsiakali, K. (2018) "User-generated-content versus marketing-generated-content: Personality and content influence on traveler's behaviour", *Journal of Hospitality Marketing and Management*, Vol. 27, No. 8, pp.946-972.
- Wamba, S.F. and Carter, L. (2016). "Social media tools adoption and use by SMEs: An empirical study", In *Social media and Networking: Concepts, methodologies, tools, and applications* (pp. 791-806). IGI Global.
- WHO (2020) "Coronavirus disease (COVID-19)", WHO, [online] <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-a-detail/coronavirus-disease-covid-19> (accessed: 12 November 2021).
- Yang, F., Wang, Y., Fu, C., Hu, C. and Alrawais, A. (2020) "An efficient blockchain-based bidirectional friends matching scheme in social networks", *IEEE Access*, Vol. 8, pp.150902-150913.
- Yang, K. and Jia, X. (2013) "Expressive, efficient, and revocable data access control for multi-authority cloud storage", *IEEE transactions on parallel and distributed systems*, Vol. 25, No. 7, pp.1735-1744.
- Yang, Y., Zhu, H., Lu, H., Weng, J., Zhang, Y. and Choo, K.K.R. (2016) "Cloud based data sharing with fine-grained proxy re-encryption", *Pervasive and Mobile computing*, Vol. 28, pp.122-134.
- Zhang, S., Yao, T., Arthur Sandor, V.K., Weng, T.H., Liang, W. and Su, J. (2021) "A novel blockchain-based privacy-preserving framework for online social networks", *Connection Science*, Vol. 33, No. 3, pp.555-575.

Analyzing Short Term Corporate Credit Risk Indicators Based on User Generated Content During the Corona-Pandemic

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Abstract: During the Corona-Pandemic, information (e.g. from the analysis of balance sheets and payment behavior) traditionally used for corporate credit risk analysis became less valuable because it represents only past circumstances. Therefore, the use of currently published data from social media platforms, which have shown to contain valuable information regarding the financial stability of companies, should be evaluated. In this data e. g. additional information from disappointed employees or customers can be present. In order to analyze in how far this data can improve the information base for corporate credit risk assessment, Twitter data regarding the ten greatest insolvencies of German companies in 2020 and solvent counterparts is analyzed in this paper. The results from t-tests show, that sentiment before the insolvencies is significantly worse than in the comparison group which is in alignment with previously conducted research endeavors. Furthermore, companies can be classified as prospectively solvent or insolvent with up to 70% accuracy by applying the k-nearest-neighbor algorithm to monthly aggregated sentiment scores. No significant differences in the number of Tweets for both groups can be proven, which is in contrast to findings from studies which were conducted before the Corona-Pandemic. The results can be utilized by practitioners and scientists in order to improve decision support systems in the domain of corporate credit risk analysis. From a scientific point of view, the results show, that the information asymmetry between lenders and borrowers in credit relationships, which are principals and agents according to the principal-agent-theory, can be reduced based on user generated content from social media platforms. In future studies, it should be evaluated in how far the data can be integrated in established processes for credit decision making. Furthermore, additional social media platforms as well as samples of companies should be analyzed. Lastly, the authenticity of user generated content should be taken into account in order to ensure, that credit decisions rely on truthful information only.

Keywords: Corporate Credit Risk, User Generated Content, Social Media

1. Introduction

The Corona-Pandemic had severe impact on risk assessment especially in the domain of corporate credit risk analysis. Due to politically imposed restriction for many business activities especially in branch stores, historical data (e. g. balance sheets and payment behavior), which is usually utilized in order to calculate credit ratings and credit default risks, could not be used in order to estimate the financial stability of many companies during the corona pandemic (Enria, 2020). The challenges caused by the limited information base for corporate credit risk assessment appeared in a period in which the uncertainty regarding the going concern of companies was high since the development of the corona-pandemic and the reactions by governments could hardly be predicted.

Previous research endeavors have shown, that especially textual user generated content (UGC) from social media platforms contains valuable short-term information, which can be used to assess the financial stability of companies (Kearney & Liu, 2014; Nassirtoussi et al., 2014). In this paper, social media platforms are defined as “a group of internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of User Generated Content” (Kaplan & Haenlein, 2010). Furthermore, UGC “can be seen as the sum of all ways in which people make use of social media” (Kaplan & Haenlein, 2010). Next to literature in which dependencies between textual UGC and prices of financial instruments are proven, the coherence of texts from social media platforms and insolvencies has been analyzed (Mengelkamp et al., 2015a).

We answer the following research question in this paper in order to contribute to the extension of the information base for corporate credit risk assessment in times with economic distortion:

In how far can textual UGC provide short-term information for corporate credit risk assessment during exceptional economic conditions?

From a theoretical perspective, the investigation of the research questions aims at reducing the information asymmetry between borrowers (principals) and lenders (agents) in credit transactions, which are one use case of the principal-agent-theory (Stiglitz, 1988; Stiglitz & Weiss, 1981).

2. Developing the research hypotheses

The explanatory power of the amount of UGC regarding financial figures and ratings of companies has been widely analyzed with varying results (Anderson, 1998; Bollen et al., 2011). In earlier literature, similar results could be obtained while analyzing news. Hereby, it was discovered, that news with negative content are dominant because people tend to be more talkative when they are unsatisfied (Hall & Young, 1991; Kotler, 1991; Richins, 1987). Therefore, we want to analyze in how far these findings can be confirmed in extraordinary economic circumstances by investigating the research hypothesis:

H1: *The amount of UGC during the corona-pandemic is greater before an insolvency of a company than for financially stable companies*

Furthermore, in many research endeavors it has been analyzed in how far sentiment (e. g. negative, neutral or positive) from textual UGC can be used to predict prices of financial instruments (e. g. stocks) or potential insolvencies (Bollen et al., 2011; Kearney & Liu, 2014; Mengelkamp et al., 2015a; Nassirtoussi et al., 2014). We evaluate in how far these insights can also be utilized to reduce the information asymmetry between lenders and borrowers in credit relationships during an economic crisis caused by public health emergencies by testing the second research hypothesis:

H2: *The sentiment of UGC during the corona-pandemic is worse before an insolvency of a company than for financially stable companies*

Thirdly, it is necessary to be able to distinguish between potential solvent and insolvent companies in order to decide to which companies credit can be granted. Mengelkamp, Hobert and Schumann (2015a) have shown, that this is possible with up to 75 % accuracy when companies are classified as potentially solvent or insolvent while applying the k-nearest-neighbor algorithm onto monthly aggregated sentiment scores from UGC in the year before an insolvency. The distinguishing between solvent and insolvent companies based on UGC is of extraordinary relevance in uncertain periods of time with unfamiliar conditions because they can provide short term information and thus, improve the traditional data base used for corporate credit assessment. Thus, we evaluate the third research hypothesis:

H3: *It is possible to distinguish between solvent and insolvent companies based on sentiment scores derived from textual UGC during the corona-pandemic*

3. Data base for hypotheses testing

We construct a data set for the testing of our hypothesis in accordance with Mengelkamp, Hobert and Schumann (2015a), who evaluated differences in amount, sentiment and classification results of UGC regarding the ten biggest German insolvencies in 2013 and a comparison group. Differing from previous studies we chose the ten biggest German insolvencies according to the number of employees who became unemployed in the year 2020, in which the corona-pandemic rose (German Federal Bureau of Statistics, 2021). The selection of German companies is suitable in this context because the governmental restriction during the corona-pandemic in Germany were among the strongest (Ritchie et al., 2022). We selected a solvent counterpart based on a discussion of the following criteria for each of the insolvent companies:

- Line of business
- Turnover
- Number of Employees
- Total Assets
- Form of Company

Then, we extracted all posts from the social media platform Twitter for the pairs of companies. We only selected Tweets in the German language, because the authors are capable of the German language and all companies are headquartered in Germany. The search terms were constructed through an iterative process in which we started with the full name of each company according to the German commercial register. Then, we successively shortened the name (e. g. regarding form of company) in order to also find Tweets which are related to the companies but do not include the full name. We stopped the shortening of the search terms if Tweets were selected, which are not related to the companies.

For each pair of companies, the Tweets, which were posted within three years before the date of insolvency from the bankrupt company, were extracted. We chose the time span of three years in order to be able to assess

in how far the companies were financially unstable before the corona-pandemic. The resulting data set, which consists of 1009 Tweets is presented in Table 1.

Table 1: Data set consisting of Tweets regarding insolvent and solvent companies

Insolvent Companies			Solvent Companies	
Date of Insolvency	Company Name	Number of Tweets	Number of Tweets	Company Name
01.07.2020	Esprit Holding Limited	9	2	Street One CBR Fashion Holding GmbH
15.04.2020	Hallhuber GmbH	374	3	Jeans Fritz GmbH
09.06.2020	Bonita GmbH	121	15	Engelhorn GmbH & Co. KGaA
01.05.2020	ARWE Holding GmbH	5	16	Mr. Wash Autoservice AG
02.07.2020	KSM Casting Group GmbH	11	2	Druckgußwerk Wolf GmbH
09.12.2020	Clemens Kleine Holding GmbH	5	4	Stölting Service Group GmbH
01.04.2020	Galeria Kaufhof GmbH	72	231	Breuninger GmbH & Co. KG
28.07.2020	Veritas AG	29	16	ATU GmbH & Co. KG
30.11.2020	Klier Hair Group GmbH	79	11	Ryf Coiffeur GmbH
25.05.2020	Tria Personal GmbH	1	3	ZAG GmbH

4. Data Analysis

After the quantification of the textual data, we present descriptive findings. Then, quantitative statistics resulting from the testing of the hypotheses are discussed.

4.1 Quantification of the textual data

The Tweets are quantified by use of the methodological approach of content analysis which was introduced by Neuendorf (2002). The quantification is necessary in order to be able to test the hypotheses H2 and H3. Referring to Mengelkamp, Hobert and Schumann (2015a), we manually labelled the data because this procedure is most accurate especially in domains in which content analysis has not been widely applied yet. This approach is more accurate especially when compared to automated analysis (Stieglitz et al., 2014). We rely on the codebook which has already been used by Mengelkamp, Hobert and Schumann (2015a) and (2015b) and is based on the methodology of Neuendorf (2002). The codebook is depicted in

Table 2.

Table 2: Codebook used for manual labelling of the Tweets (Mengelkamp et al., 2015a, 2015b; Neuendorf, 2002)

Score	Requirement
2	Tweet contains evidence concerning financial stability regarding the company
1	Tweet does not contain evidence of financial stability but sentiment is positive regarding the company
0	Tweet does not contain sentiment regarding the company or contains positive and negative sentiment
-1	Tweet does not contain evidence of financial instability but sentiment is negative regarding the company
-2	Tweet contains evidence concerning financial instability regarding the company

The labelling was performed by two coders independently from each other who achieved an intercoder reliability according to Neuendorf (2002) of 96,04%, which is above the threshold of 90% that is desirable so that the categories in the codebook can be considered as sufficiently different from each other. This means, that the assignment of sentiment scores to Tweets according to the codebook by the coders differed in only 40 (3,96%) of the 1009 Tweets. Referring to Neuendorf (2002), the 40 Tweets in which the coders did not achieve consensus were discussed and the final score used for the following analysis was determined.

Then, we summarized the Tweets and assigned sentiment scores for the group of insolvent respectively solvent companies. The result is shown in Table 3.

Table 3: Number of Tweets for insolvent and solvent companies in the sentiment categories

Score	Insolvent Companies	Solvent Companies
2	0 (0,0%)	4 (1,3%)
1	54 (7,6%)	30 (9,9%)
0	424 (60,1%)	269 (88,8%)

Score	Insolvent Companies	Solvent Companies
-1	113 (16,0%)	0 (0,0%)
-2	115 (16,3%)	0 (0,0%)
Sum	706 (70,0%)	303 (30,0%)

4.2 Descriptive overview of the data

In Table 3 it can be seen, that the number of Tweets for the insolvent companies is greater than for the group of solvent companies as it makes up 70,0% of the Tweets. This is a first indicator, that an increasing number of Tweets can be an indicator for financial instability, which supports similar findings from Mengelkamp, Hobert and Schumann (2015a). Another remarkable insight is the missing of negative Tweets in the group of solvent companies. Although Mengelkamp, Hobert and Schumann have shown in (2015a) as well as (2015b), that negative Tweets are sometimes posted with relationship to financially stable companies, our sample emphasizes, that negative postings can be an indicator for financial instability and should therefore be carefully analyzed. Furthermore, it is remarkable, that the number of neutral Tweets is even higher for both groups of companies when compared to the sample from Mengelkamp, Hobert and Schumann (2015a, 2015b). The authors reported 49,9% of neutral Tweets for insolvent companies and 79,4% for solvent companies whereby our values are above these measures with 60,1%, respectively 88,8%. An explanation for the increased number of neutral Tweets could be the longer timespan of three years in our study whereas Mengelkamp, Hobert and Schumann (2015a, 2015b) considered only one year before the insolvencies. The number of positive Tweets is low in accordance with the mentioned previous studies. All percentages in our study in these categories are even smaller which could also be caused by the expanded time span.

The frequency distribution of Tweets before an insolvency should therefore be further investigated in subsequent research endeavors in order to verify the added value for corporate credit decision making when considering the number of Tweets.

In the next step, we plotted graphs based on average monthly sentiment scores for each company. By doing so, we are able to uncover patterns in the trends of sentiment which are typical before an insolvency and can compare these with findings from Mengelkamp, Hobert and Schumann (2015a).

The insolvent company is represented by a drawn through line whereby the solvent counterpart is depicted by a dotted line:

Insolvent company: ————— Solvent company: - - - - -

In Figure 1 the sentiment score before the insolvency of the Klier Hair Group GmbH and the solvent counterpart Ryf Coiffeur GmbH can be seen. Both companies are operating in the hair dresser industry and had to close their branches in Germany due to a lockdown imposed by the German government in order to contain the coronavirus (Schuetze, 2021). It is evident, that the sentiment for the Klier Hair Group GmbH begins to continually decrease eight months before the insolvency. At this point, disturbances within the company appeared as the management tried to resign members of the employee organization (DGB Hamburg, 2020). In the following months, the closing of branches was promoted and subsequently put into action until the filing for insolvency (Salzburg24, 2020).

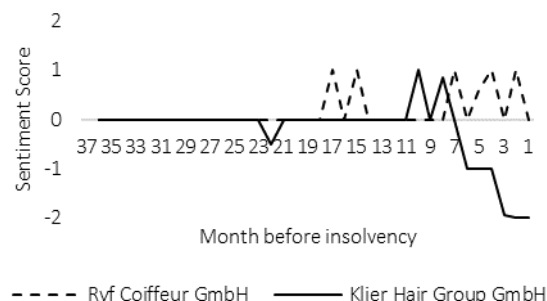


Figure 1: Monthly sentiment scores for Ryf Coiffeur GmbH and Klier Hair Group GmbH

The comparison of sentiment scores related to the Jeans Fritz GmbH with the insolvent Hallhuber GmbH, which are both operating in the clothing industry, shows similar results. The sentiment scores for the Hallhuber GmbH start to drop around 17 months before the insolvency, whereas the scores for the Jeans Fritz GmbH are continuously positive as depicted in Figure 2. The negative sentiment is mainly caused by reports about financial

losses as well as speculations about the selling of the company due to financial difficulties of the parent company (Radio Gütersloh, 2019). The positive sentiment regarding the Jeans Fritz GmbH is caused by a Tweet in which a customer praises the clothes of that company (Burgaupark Jena, 2019).

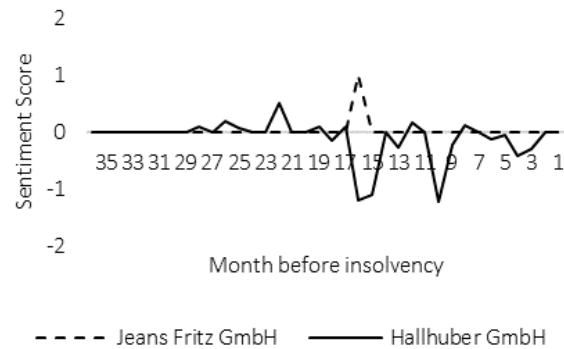


Figure 2: Monthly sentiment scores for Jeans Fritz GmbH and Hallhuber GmbH

The sentiment scores for the company pairs pictured in Figure 3 and Figure 4 are similar. Whereas the solvent companies show only positive sentiment, solely Tweets with negative sentiment are posted in the three years before the insolvencies.

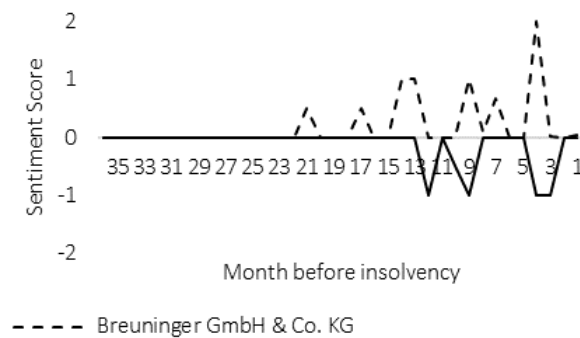


Figure 3: Monthly sentiment scores for Breuninger GmbH & Co. KG and Galeria Kaufhof GmbH

Tweets before the insolvency of Galeria Kaufhof GmbH are dominated by statements concerning strikes of employees and downsizing (Händlerbund, 2019; NTV, 2019). On the other hand, Breuninger GmbH & Co. KG is growing and establishing new jobs (N-News, 2019).

Engelhorn GmbH & Co. KGaA, that is in the group of financially stable companies, launched a new E-Commerce-platform, which results in positive sentiment (Tradebyte, 2019). Especially during the lockdowns of the corona-pandemic, E-Commerce-platforms were necessary in order to be able to generate turnover. However, for the Bonita GmbH neutral content was posted among news about a potential divestment and the reduction of governmental sureties leading to the insolvency (Kapalschinski, 2020).

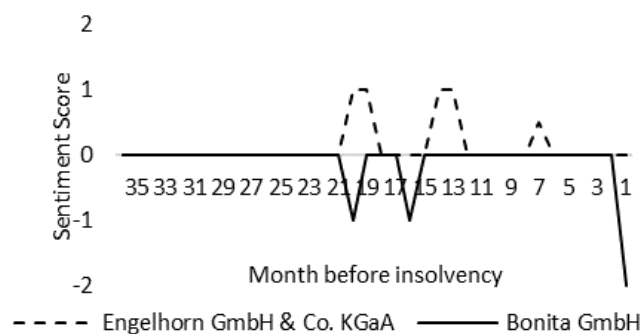


Figure 4: Monthly sentiment scores for Engelhorn GmbH & Co. KGaA and Bonita GmbH

Negative Tweets with information about the closing of stores and financial struggles dominated the UGC three years before the insolvency of Esprit Holding Limited (Lindner, 2019). Nevertheless, in Figure 5 it can be seen

that shortly before the insolvency, positive content was published. This encompasses a statement about the launch of a new E-Commerce-platform which, in contrast to the platform launched by Engelhorn GmbH & Co. KGaA, could not prevent the bankruptcy (Textilwirtschaft, 2020).

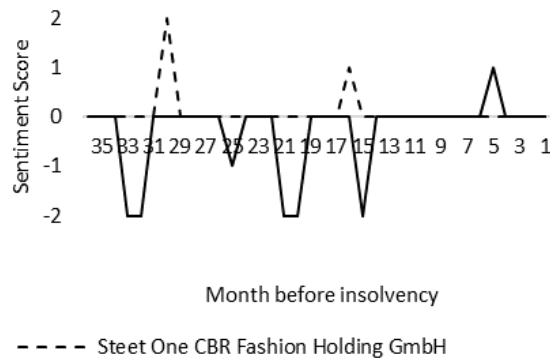


Figure 5: Monthly sentiment scores for Street One CBR Fashion Holding GmbH and Esprit Holding Limited

In Figure 6, the negative sentiment scores in the nine months before the insolvency of the Veritas AG are caused by reports about manpower reduction and the necessity of investors due to financial struggles (HV-Besuch, 2020). Beforehand and for the solvent counterpart the scores are neutral.

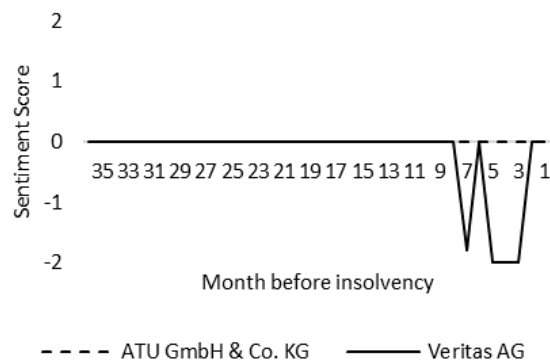


Figure 6: Monthly sentiment scores for ATU GmbH & Co. KG and Veritas AG

Before the insolvency of the KSM Casting Group GmbH, the sentiment graph does not imply a future insolvency. Although 31 months before the insolvency a Tweet in which a strike is communicated was issued, only positive sentiment concerning a sustainable, climate protecting alignment of the company can be identified as seen in Figure 7 (Forum Wermelskirchen, 2018; Nachhaltigkeitskodex, 2019).

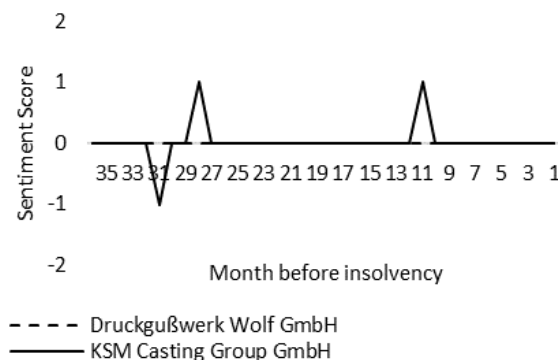


Figure 7: Monthly sentiment scores for Druckgußwerk Wolf GmbH and KSM Casting Group GmbH

Figure 8 shows only neutral sentiment with the exception of one positive score resulting from a Tweet in which an acquisition by the solvent company Stölting Service Group GmbH is discussed (audium capital partners, 2019).

The two remaining pairs of companies consisting of the Tria Personal GmbH, ZAG GmbH as well as ARWE Holding GmbH and Mr. Wash Autoservice AG show only neutral sentiment. Due to the limited added value these graphs are not depicted here.

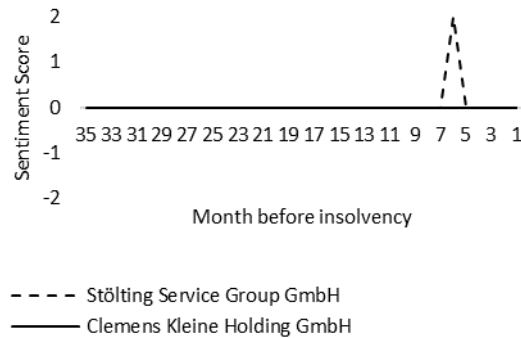


Figure 8: Monthly sentiment scores for Stölting Service Group GmbH and Clemens Kleine Holding GmbH

In general, the descriptive statistics from our sample indicate, that negative sentiment can be detected before an insolvency predominantly. Still, negative Tweets were obtained for financially stable companies. Thus, negative posts should be examined carefully before denying credit. Topics that were discussed solely before insolvencies include downsizing, strikes and financial struggles (e. g. the necessity of investors). When these topics occur related to a company, the validity and potential impact on credit decisions should be analyzed in order to prevent potential losses due to credit default.

4.3 Hypotheses testing and verification of the descriptive results through quantitative statistics

H1 (*The amount of UGC during the corona-pandemic is greater before an insolvency of a company than for financially stable companies*) is tested by application of an independent T-Test because the data is not related to dependent samples. A precondition for the T-Test is a normal distribution of the data which can be verified by application of the Kolmogorov-Smirnov-Test or the Shapiro-Wilk-Test (Field, 2009).

Table 4: P-values from Tests for normal distribution of the number of Tweets

	Significance-Level	
	Kolmogorov-Smirnov-Test	Shapiro-Wilk-Test
Insolvent companies	0,04	<0,01
Solvent Companies	<0,01	<0,01

The results in Table 4 show, that the data is not normally distributed because all p-values are below the threshold of 0,05 (Field, 2009). Therefore, it is not possible to draw conclusions with statistical significance regarding differences in the number of Tweets for both groups and H1 cannot be investigated any further.

Results from Mengelkamp, Hobert and Schumann (2015a) which showed, that the number of Tweets differs between solvent and insolvent companies, can therefore not be confirmed in order to generate added value for corporate credit decisions during times with severe governmental restrictions (e. g. a lockdown during a pandemic) by our data set.

We verified H2 (*The sentiment of UGC during the corona-pandemic is worse before an insolvency of a company than for financially stable companies*) likewise. Nevertheless, instead of the number of Tweets for both groups, we compared the sentiment scores of the Tweets regarding solvent and insolvent companies. Since our sample consists of 1009 Tweets, we can assume normal distribution due to the central limit theorem (Field, 2009). Thus, we immediately applied the T-Test whose p-value is <0,01*** and therefore we can confirm H2 on all established levels of significance (Field, 2009). The result indicates, that the sentiment before a corporate insolvency is significantly worse when compared to sentiment from UGC of solvent counterparts in the same time span. Results from Mengelkamp, Hobert and Schumann (2015a) can therefore be confirmed during extraordinary economic circumstances which are manifested by a pandemic in our data set.

H3 (*It is possible to distinguish between solvent and insolvent companies based on sentiment scores derived from textual UGC during the corona-pandemic*) is evaluated by application of the k-nearest-neighbor algorithm. This algorithm has been widely used in the domain of credit risk assessment especially with the purpose of classification between potentially solvent and insolvent companies (Mengelkamp et al., 2015a; Olson & Wu,

2008). We applied the k-nearest-neighbor algorithm to the monthly aggregated sentiment scores in accordance with Mengelkamp, Hobert and Schumann (2015a). Hereby, the scores of the six months before the insolvencies are used as input in the first iteration. Then, the algorithm is provided with data from the months two until seven before the insolvency. The time window of six months is then shifted backwards in order to analyze in how far the sentiment scores in time spans way ahead the date of insolvency contain relevant information based on which credit decisions can be made. The results in Figure 9 show, that the classification accuracy is 70% in the nine months before the insolvencies. Then, it decreases to 65% for the next two six-months-windows and consecutively is lowered to 60%. The classification accuracy stays at 60% except for the time windows in the months 11-16, 13-18 and 14-19 in which it is only 55%. For the months 18-23 or longer before the insolvencies, the k-nearest-neighbor algorithm caused an error. The error occurred because the sentiment scores for some months did not differ between the training and test data sets. Thus, a classification based on sentiment scores which are calculated based on UGC with more than 22 months before the insolvencies is not possible.

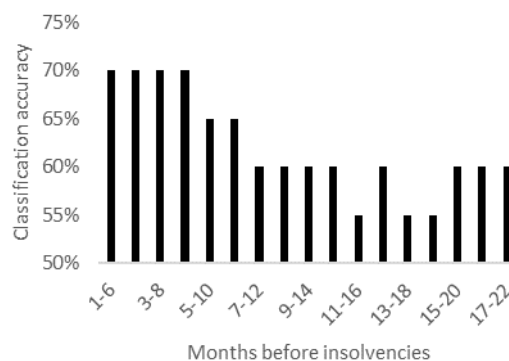


Figure 9: Classification accuracy of the k-nearest-neighbor algorithm based on monthly aggregated sentiment scores

Our results differ from findings obtained by Mengelkamp, Hobert and Schumann (2015a) in some aspects. At first, our maximum classification accuracy with 70% is lower. While analyzing the ten biggest corporate insolvencies of 2013 and solvent counterparts, Mengelkamp, Hobert and Schumann (2015a) were able to achieve a classification accuracy of 75% when data issued in the six months before the insolvencies was analyzed. Then, the classification accuracies dropped to 65% in the months 2-7 and went back up to 70% in the months 3-8 before the insolvencies whereby our classification accuracies are stable at 70% for the first nine months before the dates of insolvency. Our study provides added value because it shows, that the classification accuracy is mostly steady at 60% until 22 months before the insolvencies during the corona-pandemic, in which UGC is especially important for corporate credit risk assessment, whereby timeframes which consider only up to 13 months have been analyzed in previous literature (Mengelkamp et al., 2015a).

5. Discussion

Our findings indicate, that an increasing number of Tweets is not as appropriate as stated in previous research when it is used to assess the creditworthiness of a company, although our descriptive findings support the thesis (Mengelkamp, Hobert and Schumann, 2015). H1, which stated that the number of Tweets is significantly higher for the group of insolvent companies, could not be confirmed in contrast to previous studies (Mengelkamp, Hobert and Schumann, 2015). The validation of H2 supports previous findings. It can be confirmed based on our data set, that the sentiment before a corporate insolvency is significantly lower than for a group consisting of financially stable companies. The importance of sentiment scores for corporate credit risk analysis is therefore solidified.

In addition to that, results from the application of the k-nearest-neighbor algorithm support H3, which further emphasizes the importance to integrate the examination of UGC in corporate credit decisions processes. The classification accuracy is above 50%, which represents a random classification. in all covered months in which the k-nearest-neighbor algorithm was able to be executed without an error. Thus, practitioners and scientists can assume, that negative sentiment and especially a shift from positive to negative sentiment is an indicator for an impending insolvency.

Still, the literature base for this field of application is improvable. Our data set does not overcome all limits of previous studies for example regarding sample size, different industries and varying forms and sizes of companies (Mengelkamp et al., 2015a).

6. Concluding Comments

Further research is needed in order to clarify the validity of the amount of UGC as an indicator for future corporate insolvencies. Next to that, larger data sets with companies varying e. g. in size, legal form and industry should be analyzed. In addition to that, the research should be expanded to other social media platforms in order to evaluate their potential to provide additional information based on which the information asymmetry in principal-agents-relationships in the domain of credit assessment can be reduced. Methods, which are used to verify the authenticity of the content should also be developed.

Lastly, tools by which the UGC is automatically analyzed e. g. by use of machine learning algorithms and presented to credit decision makers, should be implemented and evaluated.

References

- Anderson, E. W. (1998). Customer Satisfaction and Word of Mouth. *Journal of Service Research*, 5(1), 5–17.
- audium capital partners. (2019). Stölting Service Group GmbH übernimmt CDS [Tweet]. Twitter.
<https://twitter.com/audiumcp/status/1147052220703289349>
- Bollen, J., Mao, H., & Zeng, X.-J. (2011). Twitter mood predicts the stock market. *Journal of Computational Science*, 2(1), 1–8.
- Burgapark Jena. (2019). Outfit JeansFritz [Tweet]. Twitter.
<https://twitter.com/BurgaparkJena/status/1086292924973887488>
- DGB Hamburg. (2020). Solidarität mit sechs gekündigten Betriebsräten bei Klier [Tweet]. Twitter.
<https://twitter.com/dgbhamburg/status/1273179013259890688>
- Enria, A. (2020). Identification and measurement of credit risk in the context of the coronavirus (COVID.19) pandemic. European Central Bank.
- Field, A. (2009). *Discovering Statistics using SPSS* (3rd Edition). Sage Publications.
- Forum Wermelskirchen. (2018). 24-Stunden-Streik bei KSM Castings Group [Tweet]. Twitter.
<https://twitter.com/forumWKde/status/958612968102645760>
- German Federal Bureau of Statistics. (2021). Biggest Corporate Insolvencies in Germany in the Year 2020 Based on the Number of Affected Employees. <https://de.statista.com/statistik/daten/studie/12997/umfrage/groesste-unternehmensinsolvenzen-in-deutschland/>
- Hall, G., & Young, B. (1991). Factors Associated with Insolvency Amongst Small Firms. *International Small Business Journal*, 9(2), 54–63.
- Händlerbund. (2019). Über 1000 Arbeitsplätze könnten wegfallen [Tweet]. Twitter.
<https://twitter.com/Haendlerbund/status/1146765351054561280>
- HV-Besuch. (2020). US-Investor übernimmt: #Veritas AG streicht 700 Arbeitsplätze in Gelnhausen [Tweet]. Twitter.
<https://twitter.com/HVBesuch/status/1231945920796921862>
- Kapalschinski. (2020). Weniger staatliche Bürgschaft als erhofft [Tweet]. Twitter.
<https://twitter.com/kapalschinski/status/1270027631388393472>
- Kaplan, A., & Haenlein, M. (2010). Users of the world unite! The challenges and opportunities of Social Media. *Business Horizons*, 53(1), 59–68.
- Kearney, C., & Liu, S. (2014). Textual sentiment in finance: A survey of methods and models. *International Review of Financial Analysis*, 33, 171–185.
- Kotler, P. (1991). *Marketing Management: Analysis, Planning, Implementation and Control*. Prentice Hall.
- Lindner, A. (2019). Einst beliebte Marke am Abgrund [Tweet]. Twitter.
<https://twitter.com/andreaslindner/status/1128342545203957760>
- Mengelkamp, A., Hobert, S., & Schumann, M. (2015a). Corporate Credit Risk Analysis Utilizing Textual User Generated Content - A Twitter Based Feasibility Study. In *Proceedings of the 19th Pacific Asia Conference on Information Systems*.
- Mengelkamp, A., Hobert, S., & Schumann, M. (2015b). Interpreting Textual user Generated Content for Supplier-Credit Risk Analysis. In M. Guillen, A. A. Juan, H. Ramalhinho, I. Serra, & C. Serrat (Eds.), *Current Topics on Risk Analysis: ICRA6 and RISK2015 Conference* (pp. 515–524).
- Nachhaltigkeitskodex. (2019). DNK 538: Die KSM Castings Group hat ihre erste DNK-Erklärung abgegeben [Tweet]. Twitter.
<https://twitter.com/NHKodex/status/1177132477837697026>
- Nassirtoussi, A. K., Wah, T. X., Aghabozorgi, S. R., & Lings, D. N. C. (2014). Text mining for market prediction: A systematic review. *Expert Systems with Applications*, 41(16).
- Neuendorf, K. A. (2002). *The Content Analysis Guidebook*. Sage Publications.

- N-News. (2019). 370 neue Arbeitsplätze bei Breuninger [Tweet]. Twitter.
https://twitter.com/search?q=370%20neue%20Arbeitspl%C3%A4tze%20bei%20Breuninger%3A%20modern%2C%20ergonomisch%2C%20zuverl%C3%A4ssig%20%20%23breuninger%20Mit%20Mehrwert%20%C3%BCberzeugt%3A%20Das%20neue%20Warendienstleistungszentrum%20von%20Breuninger%20bekommt%20370%20Arbeitspl%C3%A4tze%20%E2%80%93%20der%20besonderen%20Art&src=typed_query
- NTV. (2019). Kein Geschäft ohne uns [Tweet]. Twitter. <https://twitter.com/teleboerse/status/1205125169582411776>
- Olson, D. L., & Wu, D. (2008). *New Frontiers in Enterprise Risk Management*. Springer.
- Radio Gütersloh. (2019). Gerry Weber: Hedgefonds interessiert an Hallhuber [Tweet]. Twitter.
https://twitter.com/search?q=Gerry%20Weber%3A%20Hedgefonds%20interessiert%20an%20Hallhuber%20%20Der%20insolvente%20Haller%20Modekonzern%20Gerry%20Weber%20k%C3%A4mpft%20um%20seine%20Zukunft.%20Der%20Konzern%20hat%20offensichtlich%20einen%20K%C3%A4ufer%20f%C3%BCr%20das%20Tochterunternehmen%20Hallhuber%20gefunden.%20Dabei%20handelt%20es%20sich%20wohl%20um%20den%20Hedgefo%E2%80%A6%20http%3A%2F%2Fbit.ly%2F2UVL3A7&src=typed_query
- Richins, M. L. (1987). A multivariate analysis of responses to dissatisfaction. *Journal of the Academy of Marketing Science*, 15(3), 24–31.
- Ritchie, H., Mathieu, E., Rodes-Guirao, L., Appel, C., Giattino, C., Ortiz-Ospina, E., Hasell, J., Macdonald, B., Dattani, S., & Roser, M. (2022). COVID-19: Stringency Index. University of Oxford. <https://ourworldindata.org/covid-stringency-index>
- Salzburg24. (2020). Friseur Klier schließt alle Filialen [Tweet]. Twitter.
<https://twitter.com/Salzburg24/status/1328624654475550720>
- Schuetze, C. F. (2021). Germany's hair salons rush to throw open their doors again. *New York Times*.
<https://www.nytimes.com/2021/03/01/world/scruffy-no-more-germanys-hair-salons-rush-to-throw-open-their-doors-again.html>
- Stieglitz, S., Dang-Xuan, L., Bruns, A., & Neuberger, C. (2014). Social Media Analytics. *Business & Information Systems Engineering*, 6(2), 89–96.
- Stiglitz, J. E. (1988). Principal and Agent. *Woodrow Wilson School of Public and International Affairs*.
- Stiglitz, J. E., & Weiss, A. (1981). Credit Rationing in Markets with Imperfect Information. In *The American Economic Review* (71 (3), pp. 393–410).
- Textilwirtschaft. (2020). Deutschland-Start im Sommer: Esprit lanciert neue E-Commerce-Plattform [Tweet]. Twitter.
https://twitter.com/TW_online/status/1235775954003398657
- Tradebyte. (2019). Das Mode- und Sportkaufhaus @engelhorn wird zur Premium-E-Commerce-Plattform! [Tweet]. Twitter.
<https://twitter.com/Tradebyte/status/1134386933126356995>

Factors Impacting Intention of Formalisation of Egyptian MSMEs: What about Social Media?

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Abstract: Research on the impact of social media (SM) on the formalisation – switching from the informal to the formal sector – of micro, small, and medium enterprises (MSMEs) is scant if existent; Egypt is no exception. The need for MSMEs to increase productivity and growth are vital to Egypt's own growth and development, and formalisation tops the list of prerequisites. This study aims to examine the impact of the factors perceived by informal entrepreneurs to motivate/hinder formalisation on those entrepreneurs' intention to formalise their MSMEs. SM usage is a new factor whose impact on the intention of formalisation is also investigated. This is accomplished by adopting the conceptual framework of the Theory of Planned Behaviour (TPB). A logistic regression model was used on data collected through questionnaires from a sample of Egyptian female and youth male MSMEs owners, who comprise most informal entrepreneurs in Egypt. Results demonstrate that the factors affecting the intention of formalisation of female and youth male informal entrepreneurs are different. However, for both groups, higher educational levels and SM usage negatively affect their intention of formalisation. The one size fits all policies encouraging formalisation might not work given these differences.

Keywords: Social Media; Informal Economy; Msmes; Theory of Planned Behaviour (TPB); Formalisation; Egypt

1. Introduction

MSMEs play a significant role in the Egyptian economy, contributing in 2017 to around 80% of GDP and 75% of employment in the private sector (El-Said and Ahmed, 2017). MSMEs are predominated by microenterprises (91% of the total number of firms), most of which are in the informal sector (El-Said and Ahmed, 2017; Kolster, 2016).

Informal enterprises in this study are those unofficial/unregistered enterprises that do not comply with the official rules; however, they perform legal economic activities concealed from the formal system (ILO, 2013).

Informal/unofficial enterprises usually result from the desire to escape regulations' administrative and/or financial burdens (Djankov et al, 2010). Informality has favourable socio-economic outcomes, including reducing poverty levels (Nguyen et al, 2014). Nevertheless, it can have adverse effects both on a macro and micro levels. In Egypt, informality is argued to have negatively affected the productivity of Egyptian MSEs (Hendy and Zaki, 2012), and constrained their growth (Saif and Ghoneim, 2013). This consequently curtails Egypt's economic growth and highlights the importance of motivating formalisation. This requires identification of the factors that motivate and hinder formalisation.

In Egypt, being a female and/or a youth is among the main determinants of informality (Abou-Ali and Rizk, 2015; Hendy and Zaki, 2012). As for formalisation, it has many factors, the most important of which is the need to expand to become eligible for government support services and access to finance, to create formal contractual agreements and to avoid legal prosecution (Saif and Ghoneim, 2013). A recent factor that was added to the literature that supports the expansion and development of MSMEs is the use of information and communication technologies (ICTs), including SM (Adam et al, 2016). However, the effect of ICTs, in general, on the size of the informal sector or on formalisation has been scantily discussed with contradictory results (Molony 2008; Garcia-Murillo et al, 2013; Garcia-Murillo and Velez-Ospina, 2017). Meanwhile, to the best of the authors' knowledge, no literature has examined the role that SM specifically plays in the informal economy or on formalisation. Regarding Egypt, recent studies have examined the impact of SM use on MSMEs performance (Fakhreldin et al, 2020; authors, forthcoming), on the formation of informal online businesses/digital entrepreneurship (Miniesy et al, 2022) and on women and youth male entrepreneurs' empowerment (Beninger et al, 2016; Miniesy et al, 2021) but nothing on its impact on formalisation, which highlights a research gap that this study is intended to fill.

Using the conceptual framework of the theory of planned behaviour (TPB), this study utilises a logistic regression model to investigate the impact of the factors perceived by informal entrepreneurs to motivate/hinder formalisation on their formalisation intention. SM usage is a new factor whose impact on the intention of formalisation is also investigated. Relevant data were collected from self-assessment questionnaires, carried

through phone interviews with a sample consisting of Egyptian MSMEs entrepreneurs who reside in Greater Cairo and whose enterprises *started* as informal and have been operating online – thus having SM existence – for more than a year. This study specifically targets female, irrespective of age, and youth male entrepreneurs because they constitute the largest share of informal entrepreneurs according to the literature (Abou-Ali and Rizk, 2015; Hendy and Zaki, 2012).

This study is important considering the skyrocketing usage of SM in Egypt in the past few years (Kemp, 2022), and the importance of MSMEs development to Egypt, given their prevalence and contribution to the economy. Understanding how SM affects MSMEs will be imperative for policymakers to limit the size of the informal sector. Moreover, this study's findings are timely with the developments and consequences of COVID19 and the fact that worldwide people are becoming more connected through the extensive use of ICTs.

2. Background

2.1 Theory of Planned Behaviour (TPB)

The TPB (Ajzen 1985 & 1991) postulates that the intention of an individual to do a certain act stems from three dimensions: (1) the individual's personal attitudes and perception regarding the extent of favourability of a certain action; (2) the subjective norms or social pressures to which the individual is subjected and that affect the person's intention to perform (or not) a certain action; and (3) the individual's perceived behavioural control (i.e., the person's ability to perform the action). This control can be internal or external; the former emanates from the individual and his/her perception of his/her ability to do something, whereas the latter arises from other persons' or entities' behaviours and actions that influence and drive the individual to form a positive or negative attitude toward the intended behaviour and thus action. Henceforth, attitude, subjective norms, and perceived behavioural control work together to give rise to behavioural intention, the immediate predecessor of behaviour. When the behavioural intention is optimal and the perceived behavioural control is strong, the behaviour will be performed and can be predicted. Like many other theories, TPB has its own limitations (see LaMorte, 2019).

The conceptual framework of the TPB (Figure 1) is used to answer this study's question. Namely, the impact of the factors perceived by informal entrepreneurs to motivate/hinder formalisation on their intention to formalise their MSMEs, and the role SM plays in this context.

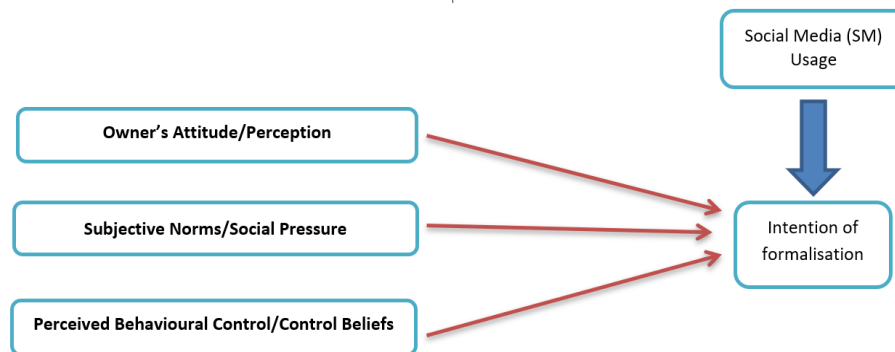


Figure 1: SM and the intention of formalisation through the lens of TPB

2.2 Review of factors motivating/hindering formalisation and hypotheses

The framework has three constructs. The first dimension/construct tackles the entrepreneur's attitude and perception of the favourability (or unfavourability) of formalisation. Based on the literature, the favourability aspects or benefits of formalisation include informal entrepreneurs' desire for innovation and expansion, whereby access to finance, much needed for expansion, requires formalisation (Mole et al, 2004). Lack of access to credit is a major obstacle faced by Egyptian MSMEs and is more prevalent among female and youth entrepreneurs (World Bank, 2016). Moreover, formalisation enables firms to establish sustainable formal contractual relationships with suppliers (Levy, 2007) and enjoy legal protection (Loayza, 1997). Furthermore, one of the widely agreed incentives for firms to formalise is to be eligible for government support services and other public goods necessary in the production process (Loayza, 1997; Bennett, 2010). Besides, formalisation

reduces workers' turnover and allows firms to attract well-experienced/educated labour (Perry et al, 2007). In addition, formalisation allows firms to avoid fines and legal sanctions (Nguyen et al, 2014). The above factors that motivate formalisation represent the first hypothesis (H1).

H1: Factors perceived by informal entrepreneurs as benefits of formalisation have *positive* and *significant* effects on their *intention* of formalisation.

More precisely, the following six variables: ability to take a loan/access to credit (*TakeLoan*), better contract enforcement (*ContEnfor*), ability to get governmental and other institutions' support (*G&I support*), reducing workers' turnover (*Wkst/O*), ability to attract better quality employees/skilled workers (*Attrcskwks*), and avoiding legal prosecution (*Avoidpresc*) are expected to have positive and significant coefficients.

Concerning the unfavourability aspects or costs of formalisation, these are themselves the factors that encourage informality in the first place. According to the literature on Egypt these include avoiding paying direct costs like taxes, social insurance, registration costs, and other overhead costs (Abd El-Fattah, 2012), and circumventing indirect costs like rigorous labour laws, corrupt officials, and bribe payments, as well as other cumbersome bureaucratic procedures, laws, and regulations (Abd El-Fattah, 2012; World Bank, 2013 & 2016). These factors that hinder formalisation represent the second hypothesis (H2).

H2: Factors perceived by informal entrepreneurs as costs of formalisation have *negative* and *significant* effects on their *intention* of formalisation.

More precisely, the two variables *Direct costs* (paying taxes, paying workers' insurance, and other overhead costs) and *Indirect costs* (abiding by rigorous labour laws, dealing with corrupt government officials, and complying with bureaucratic/governmental regulations) are expected to have negative and significant coefficients.

Another factor/variable that may affect an entrepreneur's attitude toward formalisation is her/his perception of the general support that s/he receives from the government or the lack of it. Torgler (2011) asserted that the bigger the feelings of resentment toward the state, the lower the formalisation. This represents our third hypothesis (H3).

H3: Informal entrepreneurs' perception of the government's general support has a *significant* impact on their *intention* of formalisation.

This hypothesis has never been tested in Egypt as far as the authors are aware, thus the coefficient of the reciprocate government variable (*RecipGov*) will be determined by the analysis of this study.

The second dimension/construct tackles the subjective norms/social pressure to which the entrepreneur is subjected, or in other words, the entrepreneur's perception of the support or lack of it from key persons important to him/her toward formalisation. As mentioned earlier, being a female and/or a youth are two main determinants of informality in Egypt due to both groups' limited experience and skills (Abou-Ali and Rizk, 2015; Hendy and Zaki, 2012). Moreover, social norms lay the burden of household chores and family care solely on females' shoulders, thus causing families to oppose females joining the formal sector and making informality a better option to try to maintain a work-life balance (El-Shorbagi et al, 2017). Furthermore, operating informally is legitimate and socially accepted. So, although informal enterprises are viewed to be working outside the boundaries of the "formal institutions," they are still within those of the "informal institutions" as institutional theorists (Webb et al, 2009; Williams and Shahid, 2016) argue, where the former refers to the systematised laws and regulations, while the latter refers to the values, norms, and codes of conduct within a society. As Webb et al (2009) expressed it; informal enterprises are "illegal" from the formal institutions' perspective but "legitimate" from the perspective of the informal institutions. The above three factors are the core of H4.

H4: Factors perceived by informal entrepreneurs as social pressures against formalisation have *negative* and *significant* effects on their *intention* of formalisation.

More precisely, the three variables: perceived lack of family support (spouse, parents, or others) (*Ickfamsupp*), poor work-life balance (*Work-Life balance*), and cultural acceptance (in terms of norms, values, and beliefs) of informality (*CultAccept*) are expected to have negative and significant coefficients.

The third dimension/construct tackles the perceived behavioural control of the entrepreneur regarding formalisation. Internal perceived controls stem from the entrepreneur's perception of his/her ability to do something. This could include the entrepreneur's level of education and their belief in themselves. Low levels of education are a main determinant of informality in Egypt (Abou-Ali and Rizk, 2015; Hendy and Zaki, 2012),

consequently, in theory, the higher the level of education, the higher the probability of formalisation should be. Miniesy et al (2021) showed that informal digital entrepreneurship empowers females and youth males in terms of increasing their self-esteem, self-confidence, self-efficacy, autonomy, and confidence in their business abilities. In theory, these empowerment characteristics could augment the entrepreneur's perception of their ability to perform the action (formalise) and could thus motivate formalisation. The above "ability" not "willingness" factors represent the fifth and sixth hypotheses (H5) and (H6).

H5: Informal entrepreneurs' high level of education augments their ability to formalise and thus has a *positive* and *significant* effect on their *intention* of formalisation.

Thus, the sign of the coefficient of the variable *Education* is expected to be positive and significant.

H6: Informal entrepreneurs' self-perception empowerment factors augment their ability to formalise and thus have *positive* and *significant* effects on their *intention* of formalisation.

Thus, self-esteem (*Selfestm*), self-confidence (*Selfconf*), self-efficacy (*Selfeffic*), autonomy (*Autunmy*), and confidence in their business abilities (*Busconf*) are all expected to have positive and significant coefficients.

Concerning external perceived controls, these refer to individuals' or entities' behaviours and actions that influence and drive the informal entrepreneur to form a positive or negative attitude toward the intention to formalise. In the literature, one of the important cited factors that motivates formalisation is the probability of getting caught and punished by the government because of informality (Dabla-Norris et al, 2008). This forms the seventh hypothesis (H7).

H7: Informal entrepreneur's perception of the probability of getting caught and punished by the government has a *positive* and *significant* effect on their *intention* of formalisation.

Thus, the sign of the coefficient of the variable *Probcaught* is expected to be positive and significant.

2.3 Social media and formalisation; review and hypothesis

SM affects MSMEs through many channels. Firstly, SM augments MSMEs creation by reducing barriers to information (Smith et al, 2017); curtailing the bureaucratic processes, lowering the costs of starting-up and operating a business (Cesaroni et al, 2017; Garcia-Murillo and Velez-Ospina, 2017); and providing female entrepreneurs with flexible entrepreneurial opportunities (Cesaroni et al, 2017). SM was found to be the driver of online business creation or what is referred to as "digital entrepreneurship", which is mostly informal, especially those owned by women and youth (Beninger et al, 2016; Cesaroni et al, 2017; Mehtap et al, 2019; Miniesy et al, 2022). Secondly, SM provides entrepreneurial support to business owners through access to general free consultations and experts' advice (Šceulovs and Gaile-Sarkane, 2010). Thirdly, SM aids MSMEs to attain greater visibility and outreach as it is a strategic marketing tool (Ukpere et al, 2014). Fourthly, SM facilitates creating and interacting with a huge customer network (Chanthinok, et al, 2015). Fifthly, SM leads to MSMEs business expansion and growth financially and non-financially by increasing sales volume, brand performance and customer engagement (Fakhreldin et al, 2020; authors, forthcoming).

However, the question remains: how do the above SM usage characteristics impact formalisation? They can themselves offer enough support for informal MSMEs to operate and thrive, which would consequently depress their incentives to formalise. Alternatively, SM usage can highlight the need for further expansion, which might lead to a formalisation decision. Ukpere et al (2014) highlighted that in Africa, many female entrepreneurs have utilised SM to create informal businesses, which have been converted into formal businesses later, by reinvesting the profits accumulated in the informal phase. SM usage can thus impact the intention of formalisation. This is the core of the eighth hypothesis (H8).

H8: SM usage has a *significant* direct impact on the informal entrepreneur's *intention* of formalisation.

The sign of the coefficient of the variable *SMusage* is ambiguous.

3. Methodology

This study used a self-assessment questionnaire for data collection. Data was collected through phone interviews conducted with the entrepreneurs/owners of the sample MSMEs. A purposive sampling method with a pre-set criterion was used. The targeted MSMEs had to have SM presence, started as informal, and operated online for at least one year. Their owners had to be Egyptian females and youth males from Greater Cairo and

were willing to participate in the survey. The sample is composed of 559 observations. SPSS software version 20 was utilised to analyse the data.

4. Results and Discussion

4.1 Descriptive Analysis

Figure 2 displays the demographic traits of the entrepreneurs/owners of MSMEs. Figure 3 shows the main MSMEs characteristics. Following the Central Bank of Egypt's definition (MTI, 2017), the authors determined that all surveyed enterprises were microenterprises. Figure 4 presents the nature of SM usage, while Figure 5 reveals the SM tools used. Finally, Figure 6 shows the distribution of the intention of formalisation. The descriptive statistics of the independent variables are presented in Table 1.

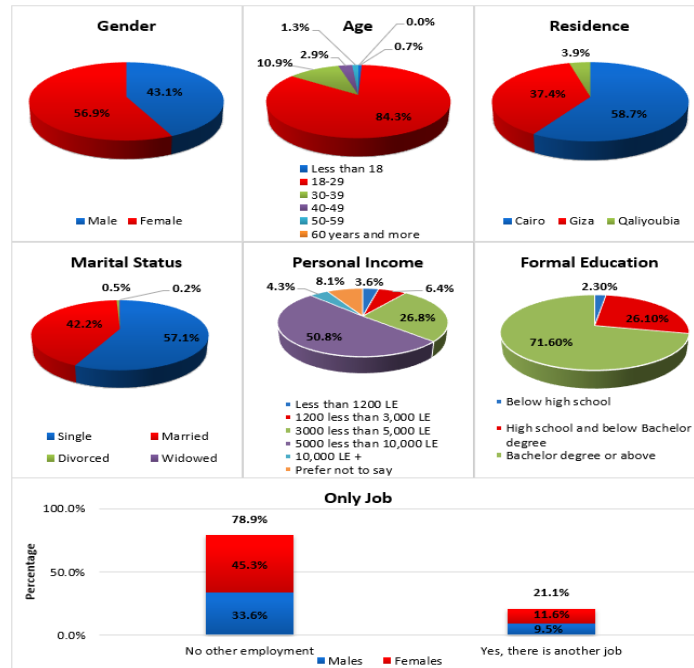


Figure 2: Demographic traits of the owner/entrepreneur

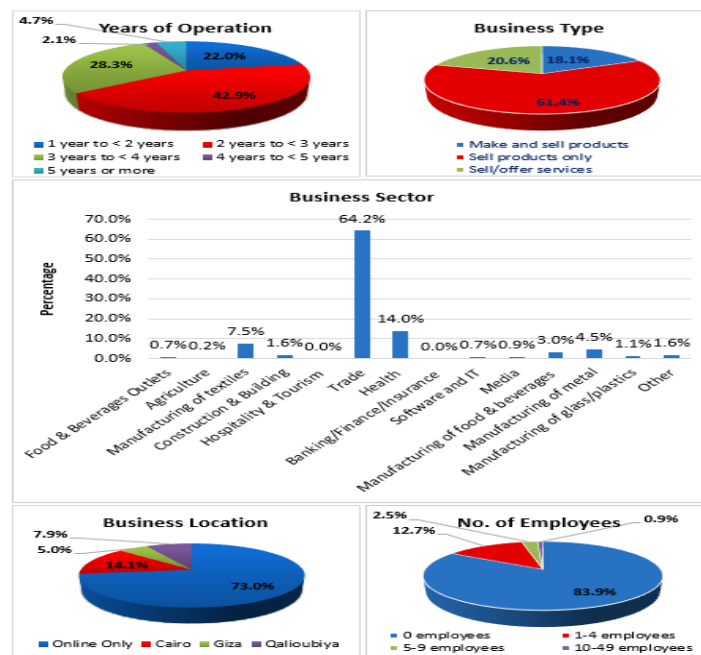


Figure 3: About the MSME

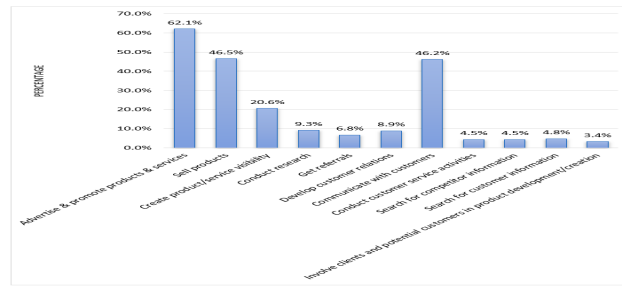


Figure 4: Nature of SM Usage

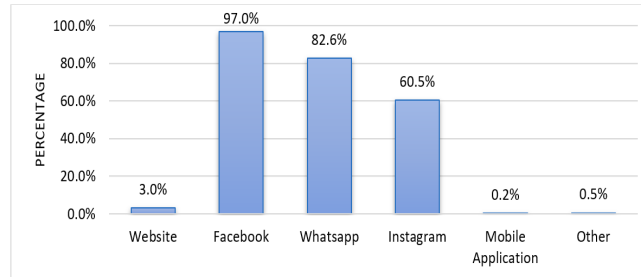


Figure 5: SM Tools

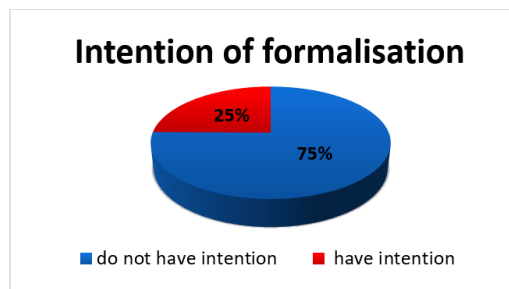


Figure 6: Distribution of sample's intention of formalisation

Table 1: Descriptive statistics of independent variables

	N	Minimum	Maximum	Mean	Std. Deviation
Owners' attitudes/perceptions towards formalisation					
Benefits					
Ability to take loans	559	1	5	3.81	1.44
Better contract enforcement	559	1	5	2.85	1.48
Get government & other institutional supp.	559	1	5	3.8	1.41
Reduce workers' turnover	559	1	5	2.18	1.17
Attract skilled workers	559	1	5	2.13	1.10
Avoid prosecution	559	1	5	2.87	1.20
Costs					
Tax burden	559	1	5	4.4	1.05
Insurance costs	559	1	5	4.14	1.20
Other overhead costs	559	1	5	4.25	1.05
Direct costs	559	2	5	4.61	0.55
Rigorous labour Laws	559	1	5	2.5	1.56
Corrupt officials	559	1	5	4.18	1.15
Compliance & Regulations	559	1	5	3.9	1.28
Indirect costs	559	1	5	3.75	0.71
Other					
Reciprocate government	559	1	5	3.06	1.29

	N	Minimum	Maximum	Mean	Std. Deviation
Subjective norms/ Social pressure towards/against formalisation					
Lack of family support	559	1	5	2.14	1.30
Poor Work–Life balance	559	1	5	4.42	0.86
Cultural acceptance of informality	559	1	5	4.25	1.03
Perceived behavioural controls					
Internal perceived controls					
Self-Esteem	559	0	6	4.13	1.33
Self-Confidence	559	0	6	3.05	1.35
Self-Efficacy	559	0	6	4.10	1.39
Autonomy	559	0	6	3.87	1.40
Business confidence	559	0	6	4.30	1.76
External perceived controls					
Probability of getting caught	559	1	5	3.25	1.38
SM usage					
SM usage	559	2	5	4.48	0.62

4.2 The model, its results, and discussion

To test the research question, a logistic regression model is used, testing hypotheses H1-H8. The model also includes several control variables, a few of them are derived from the literature. For instance, being a small/household business, that is involved in the agricultural, services and manufacturing sectors (Abou-Ali and Rizk, 2015), and being a young-age firm (Abou-Ali and Rizk, 2015; Hendy and Zaki, 2012) were among other determinants of informality.

$$\begin{aligned}
 \text{Log} \left(\frac{P(\text{intention} = 1)}{1 - P(\text{intention} = 1)} \right) &= \beta_0 + \beta_1 \text{Takeloan} + \beta_2 \text{ContEnfor} + \beta_3 \text{G\&I support} + \beta_4 \text{WksT/O} \\
 &+ \beta_5 \text{Attrcskwks} + \beta_6 \text{Avoidprosc} + \beta_7 \text{Direct costs} + \beta_8 \text{Indirect costs} \\
 &+ \beta_9 \text{Recip GoV} + \beta_{10} \text{Lckfamsupp} + \beta_{11} \text{Work – Life balance} + \beta_{12} \text{CultAccept} \\
 &+ \beta_{13} \text{Education} + \beta_{14} \text{Selfestm} + \beta_{15} \text{Selfconf} + \beta_{16} \text{Selfeffic} + \beta_{17} \text{Autunmy} \\
 &+ \beta_{18} \text{BusConf} + \beta_{19} \text{Probcaught} + \beta_{20} \text{Residence} + \beta_{21} \text{SMtool} \\
 &+ \beta_{22} \text{Marital status} + \beta_{23} \text{Income} + \beta_{24} \text{Location} + \beta_{25} \text{Only job} \\
 &+ \beta_{26} \text{Yearsonline} + \beta_{27} \text{Type of bus} + \beta_{28} \text{Sector} + \beta_{29} \text{Number of employees} \\
 &+ \beta_{30} \text{SM usage} + \varepsilon
 \end{aligned}$$

Before estimating the model, correlation tests were conducted, and insignificant variables were removed. The model 1 was run thrice, once for the whole sample, once for the male sub-sample, and once for the female sub-sample. A forward model selection method was used to again select only the significant variables. The goodness of fit of the model is established in all three runs (See Table 2).

Results show that for the whole sample, the variables that have direct and significant positive effects on the intention of formalisation are getting *G&I support*, and *Number of employees*; for the male sample, these are *ContEnfor* and *Number of employees*; while for the female sample, only *G&I support*. These findings support previous literature. Loayza (1997) and Bennett (2010) postulate that becoming eligible for governmental and other institutional support is one of the crucial incentives for firms to formalise. Levy (2007) and Saif and Ghoneim (2013) contend that formalising is necessary to establish sustainable contractual agreements. And Nguyen et al (2014) argue that formalisation for firms with an inherent need to expand, usually characterised by larger number of employees, is essential to avoid fines, legal sanctions, bribery, and other unofficial payments.

Meanwhile, the variables that have direct and significant negative effects on the intention of formalisation are: for the whole sample, *Direct costs*, *Indirect costs*, *Education* (those with bachelor's degrees or higher have lower odds of the intention of formalisation than those with lower levels of education) and *Type of bus*, specifically *sell products*; for the male sample, these are *Education* and *Sector* (being involved in trade causes lower intention of formalisation than being involved in other sectors); while for the female sample, *Direct costs*, *Lckfamsupp* (the more the lack of family support toward formalisation, the less the odds of the intention of formalisation), and *Education*. The findings regarding direct costs (taxes, insurance, and other overhead costs) and indirect costs (rigorous labour laws, corrupt officials and compliance and regulations) are expected as revealed in the literature, where being informal and thus lacking the intention to formalise is usually driven by the need to escape costs (Djankov et al, 2010; Abd El-Fattah, 2012; Abou-Ali and Rizk, 2015; Hendy and Zaki, 2012). The

results concerning the business type and the sector are logical since retail trading does not necessarily require a physical location and can be done online, especially if carried on a small scale. The negative impact of the lack of family support on females' intention to formalise also goes in line with the findings in the literature (Hendy and Zaki, 2012). As for education, the outcome is interesting and opposes the literature (Abou-Ali and Rizk, 2015; Hendy and Zaki, 2012), where it shows that the more educated/skilled the entrepreneurs are, who are also more capable of using SM and all its features, the less their intention of formalisation.

For SM usage, the more its perceived importance and benefits, the lesser the odds of the formalisation intention (same logic as Djankov et al, 2010). The rest of the variables were excluded since their p-values are greater than 0.05.

To summarize, hypotheses H1, H2 and H4 are only partially supported. H3, H6 and H7 are not supported. The reverse of H5 is supported. H8 shows that SM has a significant negative effect on the intention of formalisation.

Table 2: Regression results of the model for the whole sample and the youth male and female sub-samples

Variables	Whole Sample			Males' Sub-sample		Females' Sub-sample	
	Coefficient (Std. Err.)		Exp(B)	Coefficient (Std. Err.)	Exp(B)	Coefficient (Std. Err.)	Exp(B)
Cont.Enfor.				0.79 ** (0.373)	2.20		
G&I support	0.95 *** (0.238)		2.60			0.95 *** (0.264)	2.59
Direct costs	-0.96 *** (0.298)		0.38			-1.83 *** (0.35)	0.16
Indirect costs	-0.80 *** (0.311)		0.45				
LckFamSupp						-0.62 *** (0.242)	0.54
Education	-4.03 *** (0.509)		0.02	-3.96 *** (1.472)	0.02	-4.77 *** (0.581)	0.01
Business type		**					
Sell products	-1.75 *** (0.634)		0.18				
Sell/offer	-0.36 (0.55)		0.70				
Sector				-3.66 ** (1.461)	0.03		
No. of Employ.	1.21 ** (0.493)		3.37	5.23 *** (1.53)	186.97		
SM Usage	-1.25 *** (0.167)		0.29	-1.17 *** (0.315)	0.31	-1.61 *** (0.235)	0.20
Constant	4.39 *** (1.098)		80.87	-1.17 (1.173)	0.31	6.81 *** (1.461)	909.80
Chi-Square test	(457.91,7) ***			(153.211,4) ***		(280.053, 4) ***	
Nagelkerke R-	0.83			0.89		0.81	
Goodness of fit							
Specificity	96.70			100.00		94.70	
Sensitivity	92.80			96.70		90.70	
Overall	95.70			99.60		93.30	

Note: ***, ** represent significance at 1% and 5%, respectively

5. Conclusion

The Sustainable Development Strategy (SDS): Egypt Vision 2030 has among its well pronounced programmes and projects, promoting MSMEs and entrepreneurship, developing ICTs, and formalising the informal sector (CAPMAS, 2016). The earlier results show that policies intended for the development of ICTs and SM, might promote MSMEs and entrepreneurship, but might at the same time conflict with the objective of formalisation. To reconcile these objectives, one could look at them in stages, where policies that advocate digital entrepreneurship should first be sought to augment entrepreneurship and MSMEs creation. These should then be followed by policies that target MSMEs expansion and development to help stimulate their formalisation.

The first set of policies could include constructing the relevant digital infrastructure, promoting basic digital literacy, and using the media to highlight success stories (Miniesy et al, 2021). The second set of policies include governmental and other financial support services and programmes that specifically target relatively successful informal online businesses, such as loans provision with low interest rates or free MSME-specific expert advice. A bundle of incentives and preconditions to entice those MSMEs to formalise should also be included, such as not penalising them for their prior informal status and exempting them from taxes for a certain number of years. The Egyptian government should also endorse creative media campaigns, especially through SM, that would promote formalisation and discourage informality to change informality's cultural acceptance and encourage families to support their female entrepreneurs to formalise.

This study has two central limitations: the sample included was only from Greater Cairo and most of the enterprises were involved in trade. Both render the results not generalisable.

Acknowledgments

This study is partially financially funded by the British University in Egypt (YIRG). The authors would like to thank Ms. Nevine ElSherif, Ms. Lina Tageldin, and Mr. AbdelRahman Mokhtar for providing excellent research assistantship, and Professor John Adams for providing valuable comments.

References

- Abd El-Fattah, M. (2012) 'Survey-based Exploration of Satisfaction and Profitability in Egypt's Informal Sector', *ECES Working Papers*, No. ECESWP169-E. Retrieved from <http://www.eces.org.eg/Publication.aspx?Id=342>
- Abou-Ali, H. and Rizk, R. (2015) 'MSEs Informality and Productivity: Evidence from Egypt', *ERF Working Paper Series*, No. 916 (Cairo: Economic Research Forum).
- Adam, A., Jizat, J. and Noor, M. (2016) 'A review of factors that influenced the intention of acceptance and use of social commerce among small medium-sized enterprises in Malaysia', *Advances in Business-Related Scientific Research Journal*, Vol. 7 No. 2, pp.15-26.
- Ajzen, I. (1985). *From intentions to actions: A theory of planned behavior*. Springer, Berlin doi:https://doi.org/10.1007/978-3-642-69746-3_2.
- Ajzen, I. (1991) 'The theory of planned behavior', *Organizational Behavior and Human Decision Processes*, Vol. 50, pp.179-211.
- Bennett, J. (2010) 'Informal firms in developing countries: Entrepreneurial stepping stone or consolation prize?' *Small Business Economics*, Vol. 34, pp.53-63. Available at: <https://doi.org/10.1007/s11187-009-9194-6>
- Beninger, S., Ajjan, H., Mostafa, R., and Crittenden, V. (2016) 'A road to empowerment: social media use by women entrepreneurs in Egypt', *International Journal of Entrepreneurship and Small Business*, Vol. 27, pp.308-332.
- CAPMAS (Central Agency for Public Mobilization and Statistics) (2016). 'Sustainable Development Strategy (SDS): Egypt Vision 2030', https://www.arabdevelopmentportal.com/sites/default/files/publication/sds_egypt_vision_2030.pdf
- Cesaroni, F., Paoloni, P., and Demartini, P. (2017) 'Women in business and social media: implications for female entrepreneurship in emerging countries', *African Journal of Business Management*, Vol. 11 No. 14, pp.316-326.
- Chanthinok, K., Ussahawaniti, P. and Jhundra-indra, P. (2015) 'Social media marketing strategy and marketing outcomes: a conceptual framework', *Proceedings of Allied Academies International Conference. Academy of Marketing Studies*, Vol. 20 No. 2, pp.35-52, Jordan Whitney Enterprises, Inc.
- Chatterjee, S. and Hadi, A. (2015) *Regression analysis by example*. John Wiley & Sons.
- Dabla-Norris, E., Gradstein, M., and Inchauste, G. (2008) 'What causes firms to hide output? The determinants of informality', *Journal of Development Economics*, Vol. 85 No. 1-2, pp.1-27. doi: <https://doi.org/10.1016/j.jdeveco.2006.05.007>
- Djankov, S., Ganser, T., McLiesh, C., Ramalho, R. and Shleifer, A. (2010) 'The effect of corporate taxes on investment and entrepreneurship', *American Economic Journal: Macroeconomics* Vol. 2 No. 3, pp.31-64.
- El-Said, H., Ahmed, R. (2017) 'Micro, small and medium enterprises in Egypt', In Rym Ayadi and Emanuele Sessa (Ed.) *Micro, small and medium sized enterprises development in Egypt, Jordan, Morocco, and Tunisia: Structure, Obstacles and Policies*, EMNES Studies, No.3, pp.24-35. Available at: http://emnes.org/wp-content/uploads/2017/12/emnes_study_003-msmes-development-in-the-southern-mediterranean-countries.pdf
- El-Shorbagi, S., Rizk, A. and Kamal, A. (2017), *Women's Entrepreneurship Development Assessment: Egypt*, ILO, Cairo.
- FakhrEldin, H., Ayman, A., and Miniesy, R. (2020) 'Social media use and its effect on the performance of MSMEs in Egypt' in ECIE 2020: Proceedings of 15th European Conference on Innovation and Entrepreneurship. Rome, Italy, pp.251-260.
- Garcia-Murillo, M., Velez-Ospina, J.A., and Vargas-Leon, P. (2013) 'The techno-institutional leap and the formation of new firms', *Journal of Information Policy*, Vol. 3, pp.501-536.

- Garcia-Murillo, M., Velez-Ospina, J.A. (2017) 'ICTs and the informal economy: mobile and broadband roles', *Digital Policy, Regulation and Governance*, Vol. 19 No.1, pp.58-76. doi: <https://doi.org/10.1108/DPRG-02-2016-0004>
- Hendy, R., and Zaki, C. (2013) 'On informality and productivity of micro and small enterprises: Evidence from MENA countries', *International Journal of Entrepreneurship and Small Business*, Vol. 19 No. 4, pp.438-470.
- ILO (International Labour Organization) (2013) 'The informal economy and decent work: A policy resource guide supporting transitions to formality', *International Labour Office, Employment Policy Department – Geneva ILO 2013*
- Kemp, S. (2022) *Digital 2021:Egypt*. <https://datareportal.com/reports/digital-2022-egypt>
- Kolster, J. (2016) 'Addressing informality in Egypt', *AFDB working paper, North Africa Policy Series*. Available at: https://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/Working_paper_-_Addressing_informality_in_Egypt.pdf
- LaMorte, W. (2019) *Behavioural Change Models: The Theory of Planned Behaviour*. Boston University School of Public Health. <http://sphweb.bumc.bu.edu/otlt/MPH-Modules/SB/BehavioralChangeTheories/BehavioralChangeTheories3.html>
- Levy, S. (2007) *Good Intentions, Bad Outcomes: Informality, Productivity, and Growth in Mexico*. Brookings Institution Press.
- Loayza, N. V. (1997) 'The economics of the informal sector: A simple model and some empirical evidence from Latin America', *Policy Research Working Paper WPS 1727, World Bank, Washington, DC*.
- Mehtap, S., Ozmenekse, L. and Caputo, A. (2019), 'I'm a stay at home businesswoman: an insight into informal entrepreneurship in Jordan', *Journal of Entrepreneurship in Emerging Economies*, Vol. 11 No. 1, pp. 44-65.
- Miniesy, R., Elshahawy, E. & Fakhreldin, H. (2021). Social media's impact on the Empowerment of Women and Youth Male Entrepreneurs in Egypt. *International Journal of Gender Entrepreneurship*. DOI 10.1108/IJGE-06-2021-0085
- Miniesy, R., Shahin, M., and Fakhreldin, H. (2022) 'The Determinants of Digital Entrepreneurship by Informal Micro and Small Enterprises (MSEs) in Egypt', *World Journal of Entrepreneurship, Management and Sustainable Development*. Vol.18, No.4, pp.425-445.
- Mole, K., Ghobadian, A., O'Regan, N., and Liu, J. (2004) 'The use and deployment of soft process technologies within UK manufacturing SMEs: An empirical assessment using Logit models', *Journal of Small Business Management*, Vol. 42, No. 3, pp.303-324.
- Molony, T. (2008) 'The role of mobile phones in Tanzania's informal construction sector: the case of Dar es Salaam', *Urban Forum*, Vol. 19 No. 2, pp.175-186. doi: 10.1007/s12132-008-9028-7.
- MTI (Ministry of Trade and Industry) (2017) *MSMEs and entrepreneurship national strategy and operational plan (2018-2023): Capturing opportunities of economic transformation*.
- Nguyen, T., Verreynne, M., and Steen, J. (2014) 'Drivers of firm formalization in Vietnam: an attention theory explanation', *Entrepreneurship and Regional Development*, Vol. 26 No. 7-8), pp.574-593.
- Perry, G., Maloney, W., Arias, O., Fajnzylber, R., Mason, A., and Saavedra-Chanduvi, J. (2007) *Informality: Exit and Exclusion*. Washington, DC: World Bank.
- Saif, I. and Ghoneim, A. (2013). *The Private Sector in Post Revolution Egypt*, Carnegie Endowment for International Peace, Middle East Centre. Available at: http://carnegieendowment.org/files/egypt_private_sector1.pdf
- Šceulovs, D., and Gaile-Sarkane, E. (2010) 'Electronic tools for company's presence, identification and marketing in E-environment: Theory and practice', *Economics and Management*, Vol. 15, pp.775- 782.
- Sekaran, U. (2003) *Research Methods for Business: A Skill-Building Approach*. John Wiley and Sons, New York.
- Smith, C., Smith, J. B., and Shaw, E. (2017) 'Embracing digital networks: Entrepreneurs' social capital online', *Journal of Business Venturing*, Vol. 32 No. 1, pp.18-34.
- Torgler, B. (2011) *Tax Morale and Compliance: Review of Evidence and Case Studies for Europe*. World Bank Policy Research Working Paper 5922, World Bank, Washington, DC.
- Udry, C. (1993) 'Credit Markets in Northern Nigeria: Credit as Insurance in a Rural Economy', in Hoff, K., Braverman, A., and Stiglitz, A. (Eds.), *The economics of rural organization*, pp.87–104, Oxford University Press (for the World Bank), New York.
- Ukpere, C., Slebbert A., and Ukpere, W. (2014) 'Rising trend in social media usage by women entrepreneurs across the globe to unlock their potential for business success', *Mediterranean Journal of Social Sciences*, Vol. 5 No. 10, pp.551-559.
- Webb, J., Tihanyi, L., Ireland, R., and Sirmon, D. (2009) 'You Say Illegal, I Say Legitimate: Entrepreneurship in the Informal Economy', *Academy of Management Review*, Vol. 34 No. 3, pp.492–510.
- Williams, C. and Shahid, M. (2016) 'Informal entrepreneurship and institutional theory: explaining the varying degrees of (in)formalization of entrepreneurs in Pakistan', *Entrepreneurship and Regional Development*, Vol. 28 No. 1-2, pp.1-25, available at: <https://doi.org/10.1080/08985626.2014.963889>
- World Bank (2013) *Opening Doors: Gender Equality and Development in the Middle East and North Africa*, World Bank, Washington DC.
- (2016) *Enterprise Survey 2016*. Available on: <http://www.enterprisesurveys.org/data/exploreeconomies/2016/egypt#corruption>
<http://www.enterprisesurveys.org/data/exploreeconomies/2016/egypt#finance>

A Triple-Layered Business Model Framework for Social Media

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Abstract: Social media are increasingly based on commercial business models. Scientific literature and articles in the mass media have been available for some time discussing individual aspects of economic business models and their environmental and social impacts. Often these statements are contradictory, biased towards a certain aspect, and without context by comparison with substitute goods that cover similar needs. This paper aims to develop a framework to understand the business models of social media, including their social and environmental impact, and to identify starting points for innovations. In addition to the economic layer of the business model, the environmental and social layers are also discussed. The latter two are still underrepresented in the domain of business model analysis. First, the elements of the economic layer of social media business models are defined. Then it is shown how the single economic view can be expanded to include the environmental and social impact. Finally, we argue why the different socioeconomic backgrounds of involved stakeholders should be considered to avoid a biased, ethnocentric view of business models.

Keywords: Social Media, Business Model, Triple-Layered, Sustainability, Environmental Impact, Social Impact

1. Research question and methodology used

The research question is to develop a framework to analyze the business models of social media on economic, social, and environmental layers. A special focus is given to the interdependencies of these three layers. The framework is intended to help explain the contradictory findings in the scientific literature and statements in the mass media as well as to provide starting points for innovations. From a methodological point of view, a review of theories in the three levels is carried out. Theories were selected that have both high explanatory value for a single level and are also interconnectable. Then, the first conceptual steps are taken toward a synthesized business model framework for social media.

2. Indicators for the economic, environmental, and social layer of business models

While the economic layers of business models in general and for social media in particular have been discussed for some time, there are still few consistent findings about their impacts on environmental and social layers. This is primarily due to many possible indicators. For the social layer, often qualitative indicators based on subjective assessments must be used. In the economic and environmental layers, mainly quantitative indicators can be used, which are based on monetary and physical variables. In addition, there are pseudo-quantitative indicators describing quantitatively the response behavior to surveys, which is per se biased.

Furthermore, absolute indicators are often used, which are neither placed in the context of development over time nor with substitute goods compared. An example is when YouTube's power consumption is estimated to be higher than Spain's. Since social media meets different needs than a nation and address a different value proposition, such a comparison seems meaningless. Relative indicators relate, for example, to the development of YouTube's electricity consumption per hour streamed or compare it with traditional television, whereby the entire life cycle from production to use is considered. For a comprehensive analysis of the indicators used in all three areas of a business model, see (Joung, Carrell, Sarkar, *et al.* 2013).

3. The economic layer of the framework

The *economic layer* creates monetary and non-monetary values for social media and its stakeholders within the economic domain and mostly impacts the environmental and social domain. The Business Model Canvas by Osterwalder is used as a basis in the following section (Osterwalder 2013), (Osterwalder, Pigneur & Clark 2010). Single elements are discussed in more detail using the YouTube example. For a detailed analysis of the economic aspects of YouTube's business model, see (Pereira 2022) and (Burgess & Green 2018).

3.1 Value proposition and products

The *value proposition* defines which *monetary and non-monetary values* the social media generates for its stakeholders through its products and services. It determines which stakeholder *problems will be solved and which needs* will be satisfied. The stakeholders can be customers, suppliers, value-added partners, or uninvolved third parties, who are not directly integrated into the business model. An example of uninvolved third parties

are external effects on users of IT infrastructure in form of lower available bandwidth caused by video-based social media providers of other users.

Social media have three central value propositions:

1. For viewers/readers: discovering and watching videos and comments at a self-determined time on numerous different devices, often without having to pay for it with money.
2. For content creators: displaying content to make money, for example, as a YouTuber through paid advertising. The opportunity to receive recognition from others and to help others is also an important value proposition of displaying content.
3. For advertisers: access to a specific target group.

These value propositions are provided by products and services in the form of content, channel subscription, sharing functionalities, and different advertising formats.

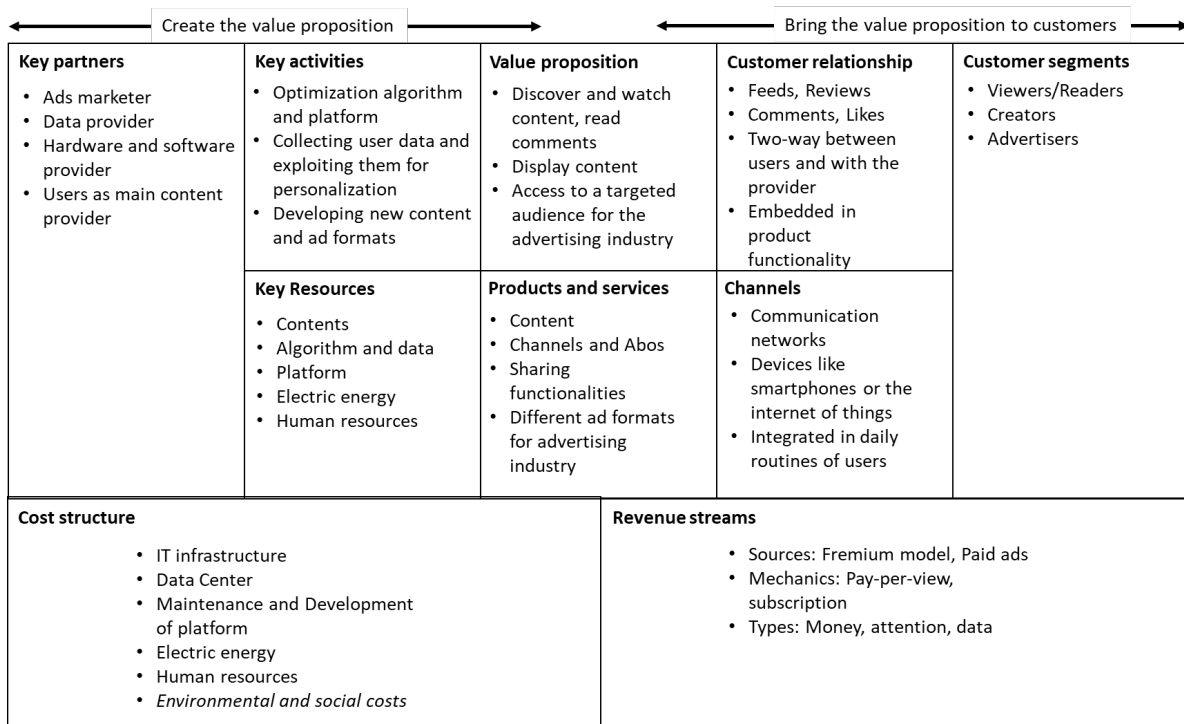


Figure 1: Economic layer of the framework

The value proposition is an abstract promise of value that can be fulfilled with *different products and services*. For example, social media can fulfill the value proposition 'access to a specific target group for the advertising industry' through banner advertising or through forms of advertising that are closely linked in real time to current user behavior, like Google Ads does. There is a high potential for innovation in changing the product or service to deliver an *established value proposition*. Google's success is largely due to providing an established value proposition for the advertising market by utilizing the special characteristics of the digital medium with the innovative Google Ads service. The competitors, however, transferred only the traditional product to the digital medium in the form of banner advertising. On the other hand, the same product and service can provide *different value propositions*. The product YouTube shorts can fulfill both the value proposition 'self-expression' through the uploaded 15-second video and 'information for others' through a short video on the current political unrest in the home country. Therefore, the distinction between value proposition and products and services is of particular importance for understanding the business models of social media.

As well the same product can lead to different value propositions, depending on the respective *sociocultural background* of the stakeholder. The value proposition 'social responsibility' but also 'social surveillance' can be ascribed to the products and services of Chinese WeChat. Regarding YouTube's channels, it is noteworthy that the two channels with the most subscribers use Hindi as their language and not English. This aspect of the dependence of the value proposition on the sociocultural background, which is particularly important and is not receiving much attention in the analysis of business models, will be discussed in section 6 of this paper.

3.2 Customer segments, relationship, and channels

Customer segments determine *for whom* the value proposition is provided. Social media tend to have three basic customer segments: viewers/readers, creators, and advertisers. Like traditional media, they serve a dual market: the viewer/reader market and the advertising market. In contrast to traditional media, viewers/readers and content creators networked directly through the digital platform of social media and are often identical. With user-generated content as a central element of social media, customers are becoming the most important suppliers. In the YouTube example, user-generated content includes videos as well as comments and ratings. Furthermore, frequently viewed and shared videos are placed higher in the display order and viewed even more frequently as a result. Thus, customers do not only create new content but have also a direct influence on the perceived value of the content of others by generating positive network effects based on their behavior.

The form of the *customer relationship* determines how the social medium *acquires and retains customers and further expands its customer base*. It also determines how the social medium *communicates with its customers* and transfers the value specified in the value proposition. Typically, social media communication channels are bidirectional and closely linked. Two-way communication makes it possible to substitute activities like market research based on surveys with analyzing users' communication content which discloses preferences when using product functionalities. An example are search functionalities on YouTube. By entering the search term, a personal interest is disclosed. This allows not only a highly personalized product offer in real-time but also an advertising message that is offered without a time delay and is highly aligned with the interests of the user when the advertising message is displayed. Upstream market research is no longer necessary.

The customer relationship of social media is characterized by feeds, reviews, comments, and various community functions. The functions of YouTube Studio include control of the relationship between the creator and the viewer, for example, by selecting whether a video is visible to all or only to selected target groups. On the other hand, the YouTube Studio also covers the relationship between YouTube and its customers, for example by the timing of the publication of a video on the platform. Another special feature of social media compared to traditional media is that customer relationships are not only carried out by one department in the company, often essentially detached from the product functionality. Social media widely embed customer relationships in product functionalities. For example, lock-in effects result from the high level of personalization of the content, and data on customer behavior is obtained from the search function.

Channels include the technical channels to bring the products to the customer segments and thereby generate the value proposition. In the case of social media, these are transmission channels such as cellular networks, landline connections, or near-field communication protocols, as well as different user devices. These include smartphones, personal computers, smartwatches, and increasingly everyday things, the Internet of Things (Petrovic 2017). One goal of social media channels is to be integrated as closely as possible into daily routines of their customers to increase the frequency of use.

3.3 Key activities, key resources, and key partners

The *key activities* include all activities that are necessary to *provide the value proposition and to develop all other elements of the business model*. For social media, these are in particular the optimization of the algorithms used to display the content and different forms of advertising, the further development of the platform, and the development of new formats for content and ads. Of particular importance is to collect data on the platform about customer behavior to personalize content and ads.

The *key resources* include those tangible and intangible resources that are necessary to carry out the key activities. In the case of social media, this is content in various video and text formats enriched with user comments. A special characteristic of social media is that the customer is also the most important supplier since user-generated content is the most important key resource. Another key resource is data on customer behavior and algorithms to select, combine and rank content and ads in a customer-specific manner. All technical resources for providing the key activities are bundled in the platform. Thus, social media is an ideal type of platform economy (Parker, Van Alstyne & Choudary 2016). Recently, awareness has increased that electric energy is an important resource too that can become scarce. Due to the severe labor shortage in the IT sector, the ability to attract and retain qualified employees is also a key resource.

Key partners enable social media to access customer groups, know-how, and resources that are of great importance for the business model. As they are difficult to replace, they differ from suppliers. Since their services cannot be bought on the market at short notice and are therefore not easily substitutable, close partnerships

are established with key partners and both business models are connected. For social media, such key partners are often ad marketers, data providers, hardware and software suppliers, and users as main content providers. In the YouTube example, the owner Google takes over many of these functions.

3.4 Cost structure

The cost structure includes all costs for the other elements of the business model. For social media, these are in particular costs for the procurement, operation, maintenance, and development of the IT infrastructure, the data center and the platform, electric energy, and human resources costs.

In traditional business model analysis, usually only monetary costs for the company are considered. Also, external effects are not taken into account, i.e. monetary or non-monetary costs that are borne by others, often uninvolved stakeholders. These costs are discussed mainly in the section on the environmental and social layers of business models.

3.5 Revenue streams

In the domain of revenue streams of the social media business model, the focus is on *sources, mechanics, and types*. To determine *revenue sources*, the social medium examines which value propositions and products customers are willing to pay for. The widespread freemium model offers customers free use of the basic product, while premium content and functions as well as ad-free access are subject to a fee. The YouTube example implements the freemium model using YouTube Premium. The largest source of income for social media is paid ads from the advertising industry.

Revenue mechanics can relate to individual service units (pay-per-view) or a subscription period. Social media mostly rely on pay-per-view mechanisms for the advertising market, billing is based on the frequency with which the advertising message is displayed. Freemium models for users, on the other hand, are usually based on subscriptions for a certain period. Pricing can be static or dynamic, depending on supply and demand.

Revenue types can be monetary or non-monetary. In social media, the user market very often uses non-monetary sources of revenue. On the one hand, these include 'attention', which increases the value of the social medium for the advertising market and leads to monetary income there. Collected customer data can also be monetized when selling the company due to an increased company value. While the non-monetary revenue stream of 'attention' has been adopted by traditional media for long time, payment through the disclosure of usage behavior data is an additional revenue stream from social media.

4. Environmental layer of the framework

As discussed above, social media have numerous external effects, particularly through their environmental and social impacts. A purely economic analysis of their business models ignores these effects. Thus, we use the triple-layered business model canvas (Joyce and Paquin, 2016) in a modified form to discuss these two dimensions of social media. For a systematic analysis of indicators in the particular sub-areas of the framework, see (Joung et al., 2013).

The environmental layer is used to analyze which negative and positive effects a company's business model has on the environment. Whether an environmental effect is considered positive or negative, a comparison should be made with an alternative product or service that meets the same customer needs. One example is the replacement of combustion with electric engines. In any case, however, a variant should also be considered where there is a change in the behavior and needs of consumers, such as the gradual replacement of automobile use by public transport and bicycles. It is probably pointless to compare the power consumption of YouTube with that of nations. YouTube's value proposition is completely different from that of a nation. YouTube and a nation are not substituting goods and therefore a comparison is not appropriate.

Reports about the negative environmental impact of social media are increasing, especially in popular science literature. In the scientific literature, statements about the environmental impact of social media are very inhomogeneous (Beuscart, Coavoux & Garroq 2022). One reason is that the comparison with substitute goods, such as traditional media, is missing. Additionally, often only single indicators of the product life cycle are shown, which does not allow valid statements to be made about the overall environmental impact of social media. In this section we will discuss, based on the Life Cycle Assessment (Joyce and Paquin, 2016), a framework for the environmental layer that takes the entire life cycle into account and enables comparison with substitute goods.

Supplies and outsourcing • Specific best in class hard- and software technology • In the case of YouTube mostly coming from Google • Main suppliers are the users	Production • Developing algorithm and platform • Collection and using data • New video and ad format Materials • Data center • Communication Networks • Platform software	Functional value • Sum of all uploaded and watched videos and comments, placed ads	End-of-life • When use is terminated, infrastructure can be used for other purposes Distribution • Physical means for transportation of functional value • Same as materials for production, in contrast to traditional media	Use phase • Technical infrastructure necessary for use
Environmental costs			Environmental benefits	
Emission, Pollution, Resource consumption, Natural habitat conservation				

Figure 2: Environmental layer of the framework

4.1 Functional value

The *functional* value represents the center of the environmental layer. It covers the entire usage process by its users within a certain period. The functional value of YouTube is the sum of all uploaded and watched videos and comments, as well as placed ads within a certain period. This functional value is made possible by the mediatization effect of social media. Due to digitization, atoms are replaced by bits, making tangible products intangible. An example of this is replacing a printed daily newspaper with content from different authors on Twitter.

4.2 Production, materials, supplies, and outsourcing

Production corresponds to the key activities in the economic layer and includes the environmental impact of business processes to provide products and services. In the case of YouTube, this is, for example, the operation of servers. *Materials* correspond to the key resources of the economic layer and include means of production such as data centers, communication networks, and platform software. *Supplies and outsourcing* include all other materials and activities necessary to create the functional value but are not part of the company's core competencies.

4.3 Use phase, end of life, distribution

The *use phase* describes the environmental impact of customers' use of the functional values. A special characteristic of digital compared to printed media is the need for IT infrastructure for use, which has a significant environmental impact. *End-of-life* environmental impacts occur when the customer decides to stop using the product. In the case of a printed newspaper, it is the disposal of the used paper. With social media, there are usually no effects in this domain since the customer's IT infrastructure is used for other purposes. *Distribution* describes the environmental impact of all physical facilities used to bring the functional value to the customer segments. In the case of social media, these often overlap with the materials for providing the functional value: IT infrastructure and networks. There is a particularly big difference between social media and, for example, a printed newspaper. The latter requires printing machines for production and human deliverers with their vehicles for distribution.

4.4 Environmental costs and benefits

The environmental impacts of the functional values lead to environmental costs and benefits, in the form of mostly quantitative indicators for emission, pollution, resource consumption, and natural habitat conservation

(Joung, Carrell, Sarkar, *et al.* 2013). Those costs and benefits can be seen as absolutely concerning the environment or relatively compared with a substitute product. In absolute terms, a reduction in costs is not equated with benefits. For example, YouTube could reduce its environmental costs if the energy required for production comes from renewable sources. But this is a decrease in environmental costs and not a benefit. An environmental benefit is, for example, the reduction of environmental pollution by linking to an e-commerce site enabling a more efficient supply chain through the disintermediation of brick-and-mortar shops. Relative costs and benefits can be identified by comparing a certain social media with a substitute good, e.g., YouTube with traditional TV or movies shown in a cinema.

5. The social layer of the framework

5.1 Social value

The social layer of business models is structured related to stakeholders. Stakeholders are those individuals or organizations that influence social media activities or are influenced by them. Companies that aim for sustainable development try to generate not only economic but also social value for their stakeholders. The focus is on increasing the well-being of the individual stakeholders. Well-being can be described as judging life positively and feeling good. To distinguish two fundamentally different aspects, retrospective life satisfaction and introspective happiness, see (Kahneman 2000), (Kahneman and Riis 2005). In the following, a structure for the social layer that is suitable for the goals of this paper is presented based on (Joyce & Paquin 2016).

5.2 End-user, Societal culture, Scale of outreach

End-users of social media are the consumers of the content, who are often also producers themselves. YouTubers, on the other hand, produce content and are customers and suppliers of YouTube, but not end users. The main social values for end-users are the opportunity to create their own online identities, to communicate with others and to build social networks, to obtain authentic information directly from the source without intermediaries like traditional media, and to be entertained.

Societal culture includes the impact of social media on society as a whole. This includes the freedom to access information from different sources without restrictions and to generate and forward information to as many others as you like. The impact on education is manifold. For example, in addition to traditional teaching authorities such as teachers, parents, and experts, constructivist learning based on a variety of sources is increasingly used (Petrovic 2019). Political participation is influenced by the fact that social media supplementing and replacing traditional media more and more as the fourth force in a democratic state. The medical and health system is influenced by more information on health topics and social media offer new opportunities in the care sector. Within the economic layer, successful business models increase the GNP and thus the material prosperity of society.

The impact of social media on societal culture can have both positive and negative effects depending on the developmental state of media literacy of a certain user group. High media literacy is necessary to take advantage of the possible positive effects and mitigate the negative ones. More information can lead to more disinformation through more fake news, but also to more opportunities to identify fake news, a problem we have known for thousands of years and go directly to authentic information. Media literacy includes a) knowledge about media, b) the ability to use media critically, c) the ability to create your own content, and d) the ability to critically analyze one's own media usage (Kreutzer 2022), (Petrovic 2022).

The scale of outreach encompasses the breadth and depth of social media's relationships with its stakeholders. The breadth of relationships includes the number of end users, their demographic diversity, and the number of countries and cultures in which a certain social media is used. Depth includes the intensity of use by the end user, the integration in their daily routines, and the coverage of impacts on End-user shown in section 5.2. YouTube has an extraordinarily high scale of outreach. It has 2.5 billion monthly end-users worldwide, of which 467 million are in India, 247 million in the USA, 106 million in Russia, and 62 million in Vietnam. Globally, 7.5% of the 18-24 year-olds and 5% of over 65 year-olds use YouTube (values for April 2022). In 2021, YouTube users in South Korea spent 39.9 hours a month on the mobile app, in India 29.6 hours, in Russia 27.1 hours, and in the United States 22.2 hours (Anon 2022).

Local communities • Number, size and diversity of facility locations • Interaction with local communities at facility locations	Governance • Ownership • Organizational structure • Decision making policy	Social value • Impact on well-being of stakeholders	Societal culture • Freedom of information • Education • Political participation • Medical and Health • Economic development • Need of media literacy	End-user • Create online identities • Communicate with others • Build social networks • Be authentically informed • Be entertained
	Employees • Health and Safety • Development • Satisfaction		Scale of outreach • Number of users • Demographic diversity • Number of countries and cultural diversity • Intensity of use	
Social costs			Social benefits	
Evaluation strongly depends on underlying socio-cultural system				

Figure 3: Social layer of the framework

5.3 Governance, employees, local communities

Governance includes the ownership structure, the organizational structure, and the decision-making processes of the respective social media. It is interesting that the leading social media sites were founded by single individuals and are often run autocratically, while those that emerged from established large corporations are less successful. The research on disruptive innovations (Yu and Hang 2010) provides explanations for this.

The social value for *employees* includes company measures for the health and safety of employees, their development, and a high level of satisfaction with their work. As already mentioned within the economic layer in the domain of critical resources, a key goal of social media companies is to hire and retain qualified employees.

Social media firms often have locations in different countries and continents. This is intended to facilitate access to qualified employees and to generate cost advantages for critical resources such as electrical energy. The understanding of sociocultural peculiarities should also be expanded to adjust value proposition and social value accordingly. For this, close interaction with local communities is necessary. This can include sourcing of non-critical resources from local suppliers, such as employee meals, or sponsoring local events. Google as the parent company of YouTube has 32 offices in North America, six in Latin America, 25 in Europe, 20 in Asia Pacific, and five in Africa and the Middle East.

5.4 Social costs and benefits

While in the economic and environmental layer, primarily monetary and physical indicators are used, social impacts are more difficult to measure due to their mostly qualitative character. Social costs are based on the subjective assessment by members of a specific community with their own sociocultural values. Thus, their judgment as costs or benefits depends on the underlying sociocultural system of certain stakeholders. For example, the sociocultural value 'Freedom of information' can be judged as a welcome social benefit in a democratic form of society, in a paternalistic-authoritarian, however, as undesirable social costs. This aspect is dealt with in the next chapter.

6. The problem of ethnocentric analysis of social media

'Price massacre in e-learning stocks - China plans deathblow' The shareholder, July 23, 2021

'Am I a teacher to the Chinese...it is presumptuous to teach other peoples how to live' Former Chancellor of Germany Helmut Schmidt, ARD special broadcast, November 10, 2015

Among the 12 largest social media platforms in the world in terms of user numbers, there are seven that originated in China. Weixin/WeChat, TikTok, Douyin, QQ, Sina Weibo, and Kuaishou together have 4.5 billion users (Statista 2022, including double counts). The country with the most YouTube users is India, with almost twice as many as the United States (Statista 2022). Understanding the business models of social media, therefore, requires a truly global perspective. This should be understood as the best possible abandon of the ethnocentric glasses that are shaped by the societal value-norm system of the individual researcher, but which does not have universal validity. See also the work of the British evolutionary biologist Richard Dawkins, who explains scientifically why every person wears a veil with a narrow slit that is determined by their value-norm system. It is the task of science to widen this slit (Dawkins 2008).

The distinction between products and services on the one hand and value proposition, on the other hand, is particularly important for understanding the value proposition in the economic layer, as well as all domains in the social layer. While products and services are observable and measurable, the value they generate depends always on stakeholders' socioeconomic backgrounds. However, researchers and mass media often judge products and services based on their own socioeconomic backgrounds, and an ethnocentric analysis takes place.

The WeChat platform operated by the Chinese company Tencent is often judged by western commentators as a 'social surveillance tool of the state'. With a different socioeconomic background, it can be assessed a 'Tool for increasing social responsibility'. One's own culturally determined values and norms lead to the risk of stereotypical assessments, preventing an understanding of WeChat's value proposition for Chinese stakeholders.

Customers' perceptions and behavior shape all business models, also those of social media. Thus, it is particularly noteworthy that most of the behavioral science research relates to people who come from WEIRD societies (Western, Educated, Industrialized, Rich, and Democratic). (Henrich et al. 2010) show in their analysis of the leading journals in psychology, that 96% of the subjects come from countries comprising 12% of the world's population. Due to their special characteristics, they belong to that group that allows the least generalizable conclusions.

Another example of the limiting WEIRD perspective is the Chinese government's recent intervention in one of the world's largest information markets, the education market. Western commentators mostly see this critically as an authoritarian economic intervention by the state into the business models of companies. The Chinese government argues that the de-commercialization of the education market will increase equal opportunities and reduce excessive pressure to perform. At the same time, the view of the USA is shaped by the 'rags-to-riches' myth based on meritocratic ethics. In contrast, (Sandel, 2020) shows that there are more students at Harvard, Princeton, and other Ivy League universities from families in the top one percent than from the entire bottom half of the income distribution of the US population.

7. Conclusion and further research

The current work on social media has a strong focus on single aspects of the underlying business model. While the economic aspects can be based on established elements and indicators, the analyses of the environmental and social impacts are still very inconsistent. For decades, business model analyses focused on economic aspects and were carried out in the disciplines of business and economics. Largely independent of this, representatives of environmental science developed indicator sets for the environmental impact, and media scientists, psychologists, and sociologists are working on the social impact. In addition, there is a high degree of ethnocentric perspective, without considering the different sociocultural backgrounds of stakeholders.

The presented framework for analyzing business models of social media supports an integrated view of all three layers. Thus, it enables coherence within a layer, but also between the economic, environmental, and social layers. The widely isolated work on a company's environmental and social issues within its CSR department should be integrated into all departments. That leads to innovation potentials, with a strong impact on the economic layer that goes far beyond a 'voluntary assumption of environmental and social responsibility'. Business models are strongly changing because of the increasing mandatory internalization of external effects. As a result of internalization, companies must bear an increased share of the environmental and social costs they cause.

The comparative analysis of business models of social media on all three layers with substitute goods, especially traditional media, is an essential future research question. Furthermore, a major aim should be to increase insight into different sociocultural backgrounds to understand the value propositions and social values of

business models in other societies. It seems necessary to discard the ethnocentric glasses as far as possible and to be cautious with normative statements. Even if it is particularly time-consuming and tedious for the researcher, this requires more participatory fieldwork in different cultures.

References

- Anon (2022) *YouTube Dossier*. [Online]. 2022. Statista. Available at: <https://www.statista.com/study/15475/youtube-statista-dossier/> (Accessed: 6 December 2022).
- Beuscart, J.-S., Coavoux, S. and Garroq, J.-B. (2022) Listening to music videos on YouTube. Digital consumption practices and the environmental impact of streaming. *Journal of Consumer Culture*. [Online] 146954052211332. Available at: doi:10.1177/14695405221133266.
- Burgess, J. and Green, J. (2018) *Youtube: online video and participatory culture*. Digital media and society. Second edition. Cambridge, UK ; Medford, MA, Polity Press.
- Dawkins, R. (2008) *The God delusion*. 1st Mariner Books ed. Boston, Houghton Mifflin Co.
- Joung, C.B., Carrell, J., Sarkar, P. and Feng, S.C. (2013) Categorization of indicators for sustainable manufacturing. *Ecological Indicators*. [Online] 24148–157. Available at: doi:10.1016/j.ecolind.2012.05.030.
- Joyce, A. and Paquin, R.L. (2016) The triple layered business model canvas: A tool to design more sustainable business models. *Journal of Cleaner Production*. [Online] 1351474–1486. Available at: doi:10.1016/j.jclepro.2016.06.067.
- Kahneman, D. (2000) Experienced Utility and Objective Happiness: A Moment-Based Approach. In: Daniel Kahneman and Amos Tversky (eds.). *Choices, Values, and Frames*. 1st edition. [Online]. Cambridge University Press. pp. 673–692. Available at: doi:10.1017/CBO9780511803475.038 (Accessed: 6 December 2022).
- Kahneman, D. and Riis, J. (2005) Living, and thinking about it: two perspectives on life. In: Felicia A. Huppert, Nick Baylis, and Barry Keverne (eds.). *The Science of Well-Being*. [Online]. Oxford University Press. pp. 284–305. Available at: doi:10.1093/acprof:oso/9780198567523.003.0011 (Accessed: 6 December 2022).
- Kreutzer, R. (2022) *Definition: Medienkompetenz*. [Online]. 2022. Available at: <https://wirtschaftslexikon.gabler.de/definition/medienkompetenz-122191> (Accessed: 30 August 2022).
- Osterwalder, A. (2013) A Better Way to Think About Your Business Model *Harvard Business Review*. [Online]. Available at: <https://hbr.org/2013/05/a-better-way-to-think-about-yo> (Accessed: 12 August 2022).
- Osterwalder, A., Pigneur, Y. and Clark, T. (2010) *Business model generation: a handbook for visionaries, game changers, and challengers*. Hoboken, NJ, Wiley.
- Parker, G., Van Alstyne, M. and Choudary, S.P. (2016) *Platform revolution: how networked markets are transforming the economy and how to make them work for you*. First Edition. New York, W. W. NORTON & COMPANY.
- Pereira, D. (2022) *Youtube Business Model* [Online]. Available at: <https://businessmodelanalyst.com/youtube-business-model/> (Accessed: 1 December 2022).
- Petrovic, O. (2022) Die Zukunft der „Wiener Zeitung“ – geht es nicht um mehr? *Wiener Zeitung*. 23913.
- Petrovic, O. (2019) Digital Media and Informal Learning: Alteration Mechanism and Captured Episodes. In: Bruce M. McLaren, Rob Reilly, Susan Zvacek, and James Uhomobhi (eds.). *Computer Supported Education*. Communications in Computer and Information Science. [Online]. Cham, Springer International Publishing. pp. 433–469. Available at: doi:10.1007/978-3-030-21151-6_21 (Accessed: 24 September 2021).
- Petrovic, O. (2017) Wie das Internet der Dinge die Kommunikation von Unternehmen verändert. *Wirtschaftsinformatik & Management*. [Online] 9 (4), 68–73. Available at: doi:10.1007/s35764-017-0078-2.
- Yu, D. and Hang, C.C. (2010) A Reflective Review of Disruptive Innovation Theory: A Reflective Review of Disruptive Innovation Theory. *International Journal of Management Reviews*. [Online] 12 (4), 435–452. Available at: doi:10.1111/j.1468-2370.2009.00272.x.

Non-Financial Reporting Through Social Media: Evidence from Spanish Local Governments

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Abstract: In recent years, different non-financial information models have arisen trying to complete the traditional financial reports prepared by companies and public administrations. The fundamental objective of these models has been to satisfy the interest of the stakeholders, which goes beyond the numbers included in the balance sheet and the income statement. In the case of the public sector, this is coupled with the discontent and distrust of citizens towards politicians and administrators of institutions, which makes it necessary to emphasize tools and strategies that can improve the transparency and accountability of administrations and restore citizen trust. This requires that economic, but also social and environmental information be provided and that it be comprehensible and clear to users. On the other hand, the fast growth of Web 2.0 and social media technology is facilitating the improvement of communication between local government and their citizens. Several authors have indicated the relevance of social media as a key tool to encourage citizen engagement by facilitating for communication, discussion, and coordination of public and social activities. This study is a first step toward understanding the use of social media tools by Spanish local governments for transparency purposes. In this vein, based on content analysis, this paper aims to investigate the extent of non-financial reporting through social media in Spanish municipalities with more than 100,000 inhabitants. Although there are many social media platforms with different functionalities, participation/engagement is a common characteristic of all of them, such as openness, conversation, connectivity, and community. Specifically, this study is focused on social media such as Twitter, Facebook, and YouTube. We have chosen these social networks because they are the ones generally implemented in Spanish municipalities: Facebook and Twitter are present in 95.9% of the municipalities and YouTube in 82.8%. This paper contributes to the debate on local government transparency and provides guidelines for developing appropriate social media strategies and policies.

Keywords: Transparency, Non-Financial Reporting, Municipalities, Social Media

1. Introduction

Studies on non-financial reporting in the public sector are progressively increasing in number. Local governments are experiencing accountability pressure from citizens due to their pivotal role in society. They engage in sustainable development and are stewards of social and environmental issues (Kaur and Lodhia, 2019). Local governments are expected to deliver services and create public value in compliance with the principles of economic, environmental, and social sustainability (Farneti et al., 2019). Specifically, in the public sector, the insufficiency of financial information is recognized even in conceptual pronouncements (Governmental Accounting Standards Board, 1994; International Public Sector Accounting Board-IPSASB, 2014), recommending the preparation of performance reporting and indicators as a complement to traditional financial statements.

In recent years, different non-financial information models have arisen trying to complete the traditional financial reports prepared by public administrations. In this sense, research has shown how have begun to provide non-financial disclosure through various types of non-financial reports, such as sustainability reports, popular reports, integrated reports, intellectual capital reports, to meet citizens' expectations and ensure adequate levels of accountability (Manes-Rossi et al., 2020). The fundamental objective of these models has been to satisfy the interest of the stakeholders, which goes beyond the numbers included in the balance sheet and the income statement. In the case of the public sector, this is coupled with the discontent and distrust of citizens towards politicians and administrators of institutions, which makes it necessary to emphasize tools and strategies that can improve the transparency and accountability of administrations and restore citizen trust (Montesinos and Brusca, 2019). This requires that economic, but also social and environmental information be provided and that it be comprehensible and clear to users.

On the other hand, the fast growth of Web 2.0 and social media technology is facilitating the improvement of communication between local government and their citizens. Several authors (Bonsón et al., 2012; Haro et al., 2018; Faber et al., 2020) have indicated the relevance of social media as a key tool to encourage citizen engagement by facilitating for communication, discussion, and coordination of public and social activities.

This paper aims to contribute to the empirical understanding of intellectual capital (IC) disclosure into the local government through social media (such as Twitter, Facebook, and YouTube) taking into consideration local governments in Spain. This paper extended its range to social networks because they are internet applications

based on Web 2.0 technology that allow organizations to share information at a high rate, thereby fostering interactivity in communication flows (Secundo et al., 2017; Silva et al., 2019). While websites are well-crafted usually mono-directional communications tools, social media platforms are better engagement (data rich) vehicles of authentic content and citizens' interaction that may reveal more about the communication of Spanish local governments with their wider stakeholder communities. The fast growth of Web 2.0 and social media technology is facilitating the improvement of communication between local government and their citizens. Specifically, we have chosen these social networks because they are the ones generally implemented in Spanish municipalities: Facebook and Twitter are present in 95.9% of the municipalities and YouTube in 82.8%.

Spanish local governments (SLG) are chosen for the purposes of this research for two reasons. First, in recent years, the growing importance of the knowledge economy in public institutions has prompted considerable the debate over the identification, measurement, and disclosure of IC (Guthrie et al., 2004; Ramírez and Tejada, 2019; Schneider and Samkin, 2008). Second, the local government is the Administration closest to the citizens and the one that provides them with the most direct and daily services, where the role of IC is critical. It is argued that IC could be used as a key element for the development of strategies, structures and processes and a communication device about how the public sector institution works to create value (Bronzetti and Sicoli, 2011).

If the role played by the IC is fundamental, no less important is the problem related to its disclosure. Due to increasing interest that arisen with respect to IC in local government and because of the limitations of annual reports as a means of IC disclosure (ICD), we consider it necessary to explore other sources of information (Cuozzo et al., 2017; Dumay, 2016; Edvinsson, 2013).

We understand that local governments can use online communication channels to communicate with citizens and improve their engagement (Cuozzo et al., 2017; Dumay, 2016; Dumay and Cai, 2015; Manes et al., 2016). Social media tools and practices can help improve the policy formulation and service delivery of local governments by enriching their interactions with citizens and improving internal knowledge management (Mossberger et al, 2013).

Analyzing the existing literature, we can observe that there is not much analysis on the disclosure of IC in municipalities (Bronzetti and Sicoli, 2011; Del Bello, 2016; Manes et al., 2016; Schneider and Samkin, 2008; Sciulli et al., 2002; Serrano et al., 2003) and we are not aware of the use of social media for this purpose.

Thus, this paper aims to provide fresh insight into the extent of ICD through social media in Spanish local governments.

To achieve this objective, we have applied a content analysis of the social media networks of 79 SLG at the beginning of 2020 to obtain an ICD index.

Therefore, the paper's contribution occurs in two ways. First, the study aims to fill this existing gap and it makes important contributions to the literature on transparency of local governments and provides an assessment of online ICD practices in local governments.

The research has significant and attendant findings. The results of the content analysis reveal that although the social media can be an effective and useful tool to disclose information to the wide range of citizens involved in local governments' activities, its use by the Spanish local councils is below the desirable level. Even so, the data reflects a low use of the social networks to transmit this kind of information.

From the point of view of the strategies to be developed in local governments, the result of our work can help for the configuration of strategies that allow to increase the diffusion of IC, satisfying the necessities of information of the most exigent citizens.

This paper is structured as follows. Section 2 describes the theoretical framework for the analysis. Section 3 describes the context of the Spanish local administration where we focus the study. Section 4 describes the research method applied. Section 5 reports the findings. The final section provides the concluding comments.

2. Variables to measure the Intellectual Capital in local governments.

The intellectual capital must include the set of intangibles which allows local government to transfer a collection of material, financial and human resources into a system capable of creating value for the citizens (Guthrie et al., 2004).

Following a widely recognized tripartite classification (Del Bello, 2016; Bronzetti and Sicoli, 2011; Manes et al., 2016; Ramírez and Tejada, 2019; Schneider and Samkin, 2008), the three basic components of the IC on local

governments that we have considered have been: human capital (HC), relational capital (RC) and structural capital (SC). These resources become critical elements for providing "dynamism" to the strategic development of local government.

To be able to analyse the information on IC published by local governments it is necessary to create a transparency index that will be based on the variables that we consider essential to report.

Following the papers of several authors (Bronzetti and Sicoli, 2011; Ramírez and Tejada, 2019; Schneider and Samkin, 2008; Sciulli et al., 2002), within the HC dimension, we should include those variables that measure the attitude in the work environment, the recognition of the efforts made, the sense of belonging, the capacity to cooperate with public managers, the skills and competencies of civil servants, whose knowledge and skills are fundamental to the success of the achievement of the objectives of the local administration.

The RC dimension should include those variables linked to service quality that reflect the relationship of local government with citizens, since this should be considered a matter of trust and respect, improving transparency and, in turn, accountability. Therefore, we have considered aspects related to the disclosure of information and its accessibility.

The SC dimension must include those variables that reflect the capacity both to achieve the objectives and to manage the changes and, therefore, to improve the decision-making process. We must include the procedures and routines applied in local government.

According to the literature studied (Bossi et al., 2005; Bronzetti and Sicoli, 2011; Ramírez et al., 2011; Manes et al., 2016; Del Bello, 2016; Schneider and Samkin, 2008; Sciulli et al., 2002; Serrano et al., 2003), variables that we have considered as key elements within each of the IC components are reported in table1.

Table 1. Intellectual capital components, variables and description

IC components	Cod	IC variables
Structural capital	SC1	Information /networking systems
	SC2	Municipality culture/values
	SC3	Management philosophy
	SC4	Management processes
	SC5	Ethical or Good Governance Code
	SC6	Achievement of objectives by service managers
	SC7	Financial relations
	SC8	Promotional tools
	SC9	Innovation and improvements
Relational capital	RC1	Events organized by the municipality
	RC2	Citizen satisfaction
	RC3	Projects with the collaboration of external partners
	RC4	Media divulgation
	RC5	Quality standards
	RC6	Initiatives on social commitment
	RC7	Initiatives on environmental commitment
	RC8	Transparency
Human capital	HC1	Work-related knowledge/know-how/Creativity
	HC2	Employees composition
	HC3	Employee's experience in profession
	HC4	Employee qualification
	HC5	Employee compensation/benefit
	HC6	Cultural diversity
	HC7	Training programme
	HC8	Conditions of service
	HC9	Women
	HC10	Turnover of personnel

3. Research methodology

3.1 Sample

The target population selected for analysis was a sample of SLG. The proximity of local governments to citizens as public service consumers allows them to be aware of information demands from them (García et al, 2013;). Moreover, local governments are an important subject for the study of social media because of traditions of citizen participation at local level (Mossberger et al., 2013).

Given the large number of Spanish municipalities and the considerable differences among them, a selection criterion was required, being population size the most appropriate. In accordance with the approach taken in previous empirical works (Alcaraz et al., 2014; Brusca et al., 2016; Cuadrado et al., 2014; García et al., 2013), we decided to select only the municipalities with a large population for the following reasons, that justify that the opportunities for them to compile information for IC reporting are greater: the available economic and technological resources are greater than in smaller municipalities (Brusca et al., 2016; Serrano et al., 2009); the professional training of officials is usually more complete than that of those in smallest (Cárcaba and García, 2010; Navarro et al., 2018), which could facilitate innovation concerning IC issues; the range of public services provided is very homogeneous (Alcaraz et al., 2014); and, due to stricter information disclosure requirements and the lower relative cost of implementation, large local governments are usually more innovative in the adoption of new technologies (Navarro et al., 2018), while a large proportion of smaller municipalities do not usually have websites nor social media (Gandía et al., 2016).

Accordingly, the sample used in this study consisted of 79 large Spanish municipalities (63 municipalities with more than 100,000 inhabitants and 16 capitals of provinces). This is suitable for our purposes and sufficient for the statistical analysis performed, for various reasons: first, it includes all the municipalities classified as major cities under Law 57/2003, on municipal transparency; second, the sample size used is like that applied in numerous specialized texts.

3.2 Research design

A content analysis was conducted to examine the online ICD provided by SLG. Content analysis aims to analyze collected information systematically, objectively, and reliably (Guthrie, 2014). The content analysis typically leads to a disclosure index, a numerical indicator that reflects the quantity of information disclosed, with the purpose of showing the level of disclosure on the communication channel analyzed (Dumay and Cai, 2015).

This study uses a self-constructed disclosure index to analyze the IC information published in the social media networks (see Table 1). This index contains 27 items, consisting of three dimensions: SC (9 items), RC (8 items) and HC (10 items). The awarded scores range from between 0 –no disclosure and 2 –full disclosure. This scoring method was selected in line with previous research (Brusca et al., 2019; Manes et al., 2016). More specifically, regarding the coding process, a score of 2 is assigned if the item is clearly defined and quantified, being easy to find on the social media network; a score of 1 if the item appeared with limited reference, being less easy to find; and a score of 0 is given if the item is not disclosed at all. Moreover, following previous disclosure studies (Guthrie et al., 2004; Schneider and Samkin, 2008) the unweighted approach is adopted. This methodology considers that all items are equally important and allows for subjectivity issues reduction.

The ICD Index is calculated as follows:

$$ICD\ Index = \frac{\sum_{i=1}^l di}{l} * 100$$

where $\sum_{i=1}^l di$ is the score obtained in the group of 27 IC items; and l is the maximum score obtainable in the group of 27 IC items. The maximum value of the ICD Index is 1 and the minimum is 0. To express this in percentage form, this was then multiplied by 100.

The data was collected manually by researchers working independently. There was an initial meeting to clearly set out the strategy for each item and then the results were reviewed at the end to solve any discrepancies and to overcome any possible bias. We analyze all social media networks of the 79 large Spanish municipalities. We considered that Twitter, Facebook, and YouTube highlight in a more dynamic way some of the information that is incorporated into the websites of local governments. The data were gathered by the authors from September 2019 to February 2020.

4. Results

Findings for the IC information disclosed by SLG in their social media networks are reported in table 2.

Table 2. Extent and quality of online IC disclosure by Spanish local governments

		SOCIAL MEDIA			
IC components	IC variables	IC quality measure Frequency (N=79)			Quality score (0-100)
		0	1	2	
Structural Capital	SC1. Information /networking systems	76	3	0	1.9
	SC2. Municipality culture/values	2	24	53	82.3
	SC3. Management philosophy	19	59	1	38.6
	SC4. Management processes	29	44	6	35.4
	SC5. Ethical or Good Governance Code	65	3	11	15.8
	SC6. Achievement of objectives by service managers	73	0	6	7.6
	SC7. Financial relations	60	12	7	16.5
	SC8. Promotional tools	2	1	76	96.8
	SC9. Innovation and improvements	79	0	0	0.0
TOTAL SC	32.8				
Relational Capital	RC1. Events organized by the municipality	0	5	74	96.8
	RC2. Citizen satisfaction	5	60	14	55.7
	RC3. Projects with the collaboration of external partners	0	7	72	95.6
	RC4. Media divulgation	0	6	73	96.2
	RC5. Quality standards	68	11	0	7.0
	RC6. Initiatives on social commitment	0	14	65	91.1
	RC7. Initiatives on environmental commitment	1	13	65	90.5
	RC8. Transparency	55	3	21	28.5
TOTAL RC	70.2				
Human Capital	HC1. Work-related knowledge/know-how/Creativity	79	0	0	0.0
	HC2. Employees composition	66	12	1	8.9
	HC3. Employee's experience in profession	63	16	0	10.1
	HC4. Employee qualification	79	0	0	0.0
	HC5. Employee compensation/benefit	0	1	0	0.6
	HC6. Cultural diversity	79	0	0	0.0
	HC7. Training programme	78	1	0	0.6
	HC8. Conditions of service	73	6	0	3.8
	HC9. Women	77	2	0	1.3
	HC10. Turnover of personnel	79	0	0	0.0
TOTAL HC	2.5				
TOTAL INDEX	35.2				

The results showed that the global ICD index for the social media networks was only 35.2 per cent. Firstly, it is worth noting that the ICD through social media is only in its initial stages. In most cases, the information provided about IC in the social media of SLG is completed with a direct link to the websites of these institutions, where the information provided is developed in greater depth. Furthermore, these low average scores indicate that although the social media can be an effective and useful tool to disclose information to the wide range of citizens involved in local governments' activities, its use by the Spanish local councils is below the desirable level. In this

sense, it is recommendable that local governments make greater efforts to disclose this relevant information and to set interaction mechanisms that ensure effective communication in the Spanish local councils.

Likewise, the results revealed that the most frequently disclosed category of IC was RC (with an average score of 70.2%), followed by SC with a score of 32.8%, and then HC with an average of only 2.5%. These values evidence that SLG are mainly using the social media networks to communicate the performance achieved through their activities and processes (SC) and the value they create for society (RC). While they do not disclose on average many of the items about HC that should be expected according to the stakeholder theory. These findings are in line with the study of Manes et al. (2016) who found that the most disclosed categories are the SC and RC, while the disclosure of HC is very low in the annual reports of Italian local governments, respectively.

A more detail analysis of each component of ICD is made below.

Relational capital. Specifically, this study emphasizes that SLG' social media networks content usually relates to "Events organized by the municipality", "Projects with the collaboration of external partners", "Media divulgation" and "Initiatives on social and environmental commitment". However, other issues such as "Quality standards", and "Transparency" are less widely disclosed.

Structural capital. Specifically, the disclosure of the items "Information/networking systems", "Management philosophy", "Management processes", "Ethical or Good Governance Code" and "Achievement of objectives by service managers" was very low on social networks.

Human capital. The SLG seem to be reluctant to reveal aspects of the human capital (only 2.5% on social networks). It is worth mentioning that lack of information via social networks of the items "Work-related knowledge/know-how/Creativity", "Employee qualification", "Cultural diversity" and "Turnover of personnel".

These results supported the position of several previous studies on ICD (Del Bello, 2006; Manes et al., 2016; Sciulli et al., 2002) that indicated the need that local governments make greater efforts to disclose this relevant information.

5. Conclusions and discussion

Despite the Internet is an effective medium to improve transparency and accountability, our results show that SLG make limited use of their social media to disclose information about IC. In general terms, the level of online ICD is low (only 35.2 per cent for social media networks). In this sense, our study points out that, despite the potential opportunities provided by social media to build and enforce relationships with the society, the use of social media networks by SLG is only its initial stages. On the other hand, the results revealed that SLG are mainly using the social media networks to communicate the value they create for society (relational capital) and the performance achieved through their activities and processes (structural capital). While information on human capital is practically not disseminated.

From the academic standpoint, this paper makes several key contributions to the existing body of knowledge. First, we extend prior research on local government transparency (Mossberger et al., 2013), focusing on ICD, a neglected area in the public sector accounting literature. Previous studies on ICD have mainly focussed on the private sector (Pisano et al., 2017; Guthrie et al., 2004), whereas the public sector has been less researched (Del Bello, 2016; Manes et al., 2016; Schneider and Samkin, 2008). Second, this study explores an innovative tool to provide ICD in the local government context: social media, while previous studies focus on traditional tools as annual report (Schneider and Samkin, 2008; Sciulli et al., 2002). Likewise, the social media have some features that differentiate greatly from website, tool mainly investigated in the empirical literature on e-disclosure. Social media are becoming more relevant for local governments for promoting interactions between them and citizens and for disclosure government information. However, the existing empirical literature on disclosure via social media is scarce (Guillamón et al., 2016; Ramírez and Tejada, 2019). To our knowledge, this study is the first one focuses on investigating the determinants of ICD via social media in local governments.

From a practical point of view, the results of our research could be useful for policymakers, regulators, and governments' managers to improve the online transparency addressing ICD issues. In this sense, our findings could be of interest to government bodies to identify the items that tend to be disclosed to a greater extent and those still being undervalued to improve the content disclosed in social media networks. Specifically, SLG can be recommended to focus on reporting higher quality information on achievement of objectives by service managers, financial relations, innovation and improvements, quality standards and almost all HC components.

Despite the contributions, this study has some limitations, which need to be overcome in the future. First, the study is based on an ICD index, which may involve a certain degree of subjectivity; although the index is quite extensive to include the main items about IC, certain aspects might have been left out. Second, the sample is made up of the largest municipalities, which have undoubtedly headed the process of accountability; however, other minor municipalities have been excluded from the analysis. Third, the research covered a single year, thus failing to capture reporting trends through longitudinal analysis. Future studies may use a longitudinal data set within a country or cross-country context, which may arguably enhance the generalizability of their findings. Likewise, it could be very valuable to carry out studies that encompass the opinion of the citizens about what they consider to be the most important information about IC that should be disclosed by local governments. Despite these limitations, this paper offers a valuable contribution to the lack of prior research in this area and provides a useful framework through which ICD can be made in online media of local governments.

References

- Alcaraz, F.J., Navarro, A. and Ortiz, D. (2014), "Factors determining online sustainability reporting by local governments", *International Review of Administrative Sciences*, Vol. 81, No. 1, pp. 79-109.
- Bonsón, E., Torres, L., Royo, S., and Flores, F. (2012), "Local e-government 2.0: Social media and corporate transparency in municipalities", *Government Information Quarterly*, Vol. 29, No. 1, pp. 123-132.
- Bronzetti, G and Sicoli, G. (2011), "The application of intellectual capital reports in local authorities: analysis and empirical evidence", *International Journal of Knowledge-Based Development*, Vol 2, No 1, pp. 85-106
- Brusca, I., Manes, F. and Aversano, N. (2016), "Online sustainability information in local governments in an austerity context. An empirical analysis in Italy and Spain", *Online Information Review*, Vol. 40, No. 4, pp. 497-514.
- Brusca, I., Cohen, S., Manes, F. and Nicoló, G. (2019), "Intellectual capital disclosure and academic rankings in European universities. Do they go hand in hand?", *Meditari Accountancy Research*, Vol. 28, No. 1, pp. 51-71.
- Cárcaba, A., and García, J. (2010), "Determinants of online reporting of accounting information by Spanish local government authorities", *Local Government Studies*, Vol. 36, No. 5, pp. 679-695.
- Cuadrado, B., Frías, J. and Martínez, J. (2014), "The role of media pressure on the disclosure of sustainability information by local governments", *Online Information Review*, Vol. 38 No. 1, pp. 114-135.
- Cuozzo, B., Dumay, J., Palmaccio, M., and Lombardi, R. (2017), "Intellectual capital disclosure: a structured literature review", *Journal of Intellectual Capital*, Vol.18 No.1, pp. 9-28.
- Del Bello, A. (2016), "Intangibles and sustainability in local government reports". *Journal of Intellectual Capital*, Vol 7, No 4, pp. 440-456.
- Dumay, J. (2016), "A critical reflection on the future of intellectual capital: from reporting to disclosure", *Journal of Intellectual Capital*, Vol. 17 No. 1, pp. 168-184.
- Dumay, J. and Cai, L. (2015), "Using content analysis as a research methodology for investigating intellectual capital disclosure: a critique", *Journal of Intellectual Capital*, Vol. 16 No. 1, pp. 121-155.
- Edvinsson, L. (2013), "IC 21: 'reflections from 21 years of IC practice and theory'", *Journal of Intellectual Capital*, Vol. 14 No. 1, pp. 163-172.
- Faber, B., Budding, T., and Gradus, R. (2020), "Assessing social media use in Dutch municipalities: political, institutional, and socio-economic determinants", *Government Information Quarterly*, Vol. 37, No. 1, pp. 101-110.
- Farneti, F., Guthrie, J. and Canetto, M. (2019), "Social reports of an Italian provincial government: a longitudinal analysis", *Meditari Accountancy Research*, Vol. 27 No. 4, pp. 580-612.
- Gandía, J.L., Marrahí, L. and Huguet, D. (2016), "Digital transparency and Web 2.0 in Spanish city councils", *Government Information Quarterly*, Vol 33, No. 1, pp. 28-39.
- García, I.M., Frías, J.V. and Rodríguez, L. (2013), "Determinants of corporate social disclosure in Spanish local Governments", *Journal of Cleaner Production*, Vol. 39, No. 2, pp. 60-72.
- Governmental Accounting Standards Board, GASB (1994). Concepts Statement nº 2 "Service Efforts and Accomplishments Reporting". GASB.
- Guillamón, MD.; Rios AM.; Gesuele B. and Metallo, C. (2016), "Factors influencing social media use in local governments: The case of Italy and Spain", *Government Information Quarterly*, No 33, pp. 460-471
- Guthrie, J. (2014), "In defence of disclosure studies and the use of content analysis: a research note", *Journal of intellectual capital*, Vol 5 No. 2, pp. 291-292.
- Guthrie, J., Petty, R., Yongvanich, K. and Ricceri, F. (2004), "Using content analysis as a research method to inquire into intellectual capital reporting". *Journal of Intellectual Capital*, Vol. 5, No. 1, pp. 282-293.
- Haro, A., Sáez, A., and Caba, M.C. (2018), "Using social media to enhance citizen engagement with local government: Twitter of Facebook?", *New Media & Society*, Vol. 21, No. 1, pp. 29-49.
- International Public Sector Accounting Standards Board, IPSASB (2014), Conceptual Framework for General Purpose Financial Reporting by Public Sector Entities. IPSASB.
- Kaur, A., and Lodhia, S.K. (2019), "Sustainability accounting, accountability and reporting in the public sector", *Meditari Accountancy Research*, Vol. 27 No. 4, pp. 498-504.
- Manes Rossi, F.; Citro, F. and Bisogno, M. (2016), "Intellectual capital in action: evidence from Italian local governments", *Journal of Intellectual Capital*, Vol. 17, No. 4, pp. 696-713.

- Manes-Rossi, F., Aversano, N. and Tartaglia Polcini, P. (2020), "Popular reporting: learning from the US experience", *Journal of Public Budgeting, Accounting and Financial Management*, Vol. 32 No. 1, pp. 92-113.
- Montesinos, V. and Brusca, I. (2019), "Non-financial reporting in the public sector: alternatives, trends and opportunities", *Spanish Accounting Review*, Vol. 22, No. 2, pp. 122-128.
- Mossberger, K., Wu, Y., and Crawford, J. (2013), "Connecting citizens and local governments? Social media and interactivity in major U.S. cities", *Government Information Quarterly*, Vol 30, No 4, pp. 351-358.
- Navarro, A., Alcaraz, F.J. and Ortiz, D. (2018), "Enhancing sustainability transparency in local governments – an empirical research in Europe", *Sustainability*, Vol. 10, pp. 1-22.
- Pina, V., Torres, L., and Royo, S. (2010), "Is E-government promoting convergence towards more accountable local governments?", *International Public Management Journal*, Vol. 13, No. 4, pp. 350–380.
- Pisano, S., Lepore, L. and Lamboglia, R. (2017), "Corporate disclosure of human capital via LinkedIn and ownership structure: an empirical analysis of European companies", *Journal of Intellectual Capital*, Vol. 18, No. 1, pp. 102-127.
- Ramírez, Y., and Tejada, A. (2019), "Digital transparency and public accountability in Spanish universities in online media", *Journal of Intellectual Capital*, Vol 20, No. 5, pp.701-732
- Schneider, A. and Samkin, G. (2008), "Intellectual capital reporting by the New Zealand local government sector", *Journal of Intellectual Capital*, Vol. 9, No 3, pp. 456-486
- Sciulli, N., Wise, V., Demediuk, P. and Sims, R. (2002), "Intellectual capital reporting: an examination of local government in Victoria", *Accounting, Accountability & Performance*, Vol. 8, No. 2, pp. 43-60
- Secundo, G., Del Vecchio, P., Dumay, J. and Passiante, G. (2017), "Intellectual capital in the age of big data: establishing a research agenda", *Journal of Intellectual Capital*, Vol. 18, No. 2, pp. 242-261.
- Serrano, C.; Mar, C. and Bossi, A. (2003), "The measurement of intangible assets in public sector using scaling techniques", *Journal of Intellectual Capital*, Vol. 4, No. 2, pp. 249-27
- Serrano, C., Rueda, M., and Portillo, P. (2009), "Factors influencing e-disclosure in local public administrations", *Environment and Planning C: Government and Policy*, Vol. 27, No. 2, pp. 355–378.
- Silva, P., Tavares, A.F., Silva, T. and Lameiras, M. (2019), "The good, the bad and the ugly: Three faces of social media usage by local governments", *Government Information Quarterly*, Vol. 36, No. 2, pp. 469-479.

Opinion Aggregator Platforms In The Restaurant Sector

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Abstract: This work intends to understand to what level consumers collect information before going to a restaurant and if they know and use online Apps for gathering information and restaurants reservation, and above all, what if they trust in these Apps. To understand consumer trust in online platforms, a set of variables was established with emphasis on consumer happiness with the experience, consumer satisfaction, online brand relationship, online brand experience, and time availability. We used a quantitative methodology – PLS-SEM - and data was gathering by an online survey collected in May 2021, for Portuguese consumers. The direct effect of the relations hypothesizes are conforming; however, the moderate effect of time availability only has effect on the relation between online brand experience and consumer's happiness with the Apps. This study contributes to fulfill the gap existing in the research on consumer rating foods Apps.

Keywords: Online Brand Experience, Online Apps, Drivers of online platforms use

1. Introduction

The Internet has changed the configuration of consumption globally. Consumers have become more enlightened and have more resources to find the necessary information for their choice process. By 2022 the world population is expected to be close to 8 billion (World Bank 2021), of which approximately 4.7 billion are internet users (Johnson 2021) and 3.8 billion are smartphone users (Galov 2022). Approximately 230 billion app downloads were recorded in 2020 (Ceci 2021).

This study is contextualized in Portugal, where approximately 80% of the population is an internet user (World Bank 2021) and 56% of the population uses the internet as a mean to purchase online, values historically lower than the European average 95% and 73% respectively (Lone et al. 2021).

This work aims to know to what extent consumers collect information before going to a restaurant and if they know and use online Apps for information collection and reservation of restaurants, and above all, what influences their trust in these Apps.

To understand consumer trust in online platforms, a set of variables was established with emphasis on consumer happiness with the experience, consumer satisfaction, online brand relationship, online brand experience, and time availability.

2. Literature Review

2.1 Consumer Opinion Aggregator Platforms

With the diffusion of mobile apps and online interactive platforms, the number of user reviews on websites such as Tripadvisor has increased, becoming one of the most important ways for consumers to express their opinion about products and services (Minkwitz 2018; Yan et al. 2021). The growth of these platforms has allowed online reviews to become one of the main sources of recommendations constituting an aid for consumers in their online purchasing process, such as when booking hotels, buying products, ordering meals, among others (Huang et al. 2020; Yan et al. 2021). Thus, the feedback expressed by these consumers can influence the final decisions of other users (Ukpabi and Karjaluo 2018), in line with the growing importance of the concept of user generated content and its impact on modern marketing (Ray and Bala 2021).

At the same time, these platforms can also be useful for companies. Monitoring post-purchase attitudes is of great importance to marketers and management professionals. Consumer behavior has become easier to track allowing companies to monitor consumer feedback, obtain information and concerns that allow them to improve their products and services (Yan et al. 2021; Mondo, et al. 2022).

Applications and platforms such as TripAdvisor and Yelp have demonstrated their importance for both consumers and managers (Lu and Stepchenkova 2015). These platforms act as references, as authentic brands, to which consumers and managers turn for information (Minkwitz 2018). Their use can consequently provide an experience, enable a trusting relationship, enjoyable use, and overall satisfaction.

2.2 Online Brand Experience - OBE

In relating to and searching for a brand, consumers seek satisfaction of their experiential needs (Schmitt et al. 2015). Brand experience involves cognitions, sensations, feelings, and behavioral responses that are generated by brand-related stimuli, such as design and communication (Brakus et al. 2009; Budi et al. 2021).

Consumers can have experiences with the brand through various means, including the Internet. In the digital context, these experiences may involve a diversity of stimuli and situations such as the search for products/services, their evaluation, and their purchase (Brakus et al. 2009). In this process, brand experience can be considered a way to differentiate products and services and form perceptions about a brand (Moreira et al. 2017).

A positive brand experience can have several consequences. First, this experience can have a positive effect on customer satisfaction (Ha and Perks 2005), information sharing, recommendation to other consumers, repeat purchase (Park 2017) and brand loyalty (Budi et al. 2021).

2.3 Online Brand Relationship - OBR

By interacting with a brand online, and experiencing it, the consumer is creating a relationship and a connection with it (Christodoulides et al. 2006). This relationship can be understood as a construct composed of functional and affective connections with the brand. Some authors (Park et al. 2010; MacInnis and Folkes 2017) advance the concept of brand attachment, that is, the connection between the consumer and the brand.

This relationship grows stronger as customer-brand interactions increase in both frequency and duration. Therefore, the more frequent the interaction between consumer and brand and the longer the time elapses, the stronger the relationship may become (Christodoulides et al. 2006).

The relationship with the brand has a positive effect on customer satisfaction (Budi et al. 2021), and can increase the intention to repeat purchase and generate loyalty (Park et al. 2013).

2.4 Consumers' time availability

The consumer's time availability may eventually condition consumption experience. In fact, this availability may be one of the main factors influencing the selection of shopping channels. Kim and Park (2007) argue that consumers who value their time tend to shop online, while consumers who have time available shop more offline. In fact, nowadays, convenience and time saving are key reasons for shopping online (Khalil 2014).

Understandably, in general, people feel more positive emotions when they invest their time in positive experiences. In fact, time is one of the precious resources that matter for happiness. Thus, to promote happiness people should consider spending more time engaged in activities and experiences that give them pleasure (Mogilner et al. 2018).

2.5 Happiness with the Experience - HE

Research in the field of digital marketing has paid particular attention to customer satisfaction (Ertemel et al. 2021). In the context of consumption, the concept of happiness emerges as a higher level of customer satisfaction (Alexander 2010), which can improve people's quality of life and lead to repeat experience (Gong and Yi 2018).

In general, happiness constitutes a positive judgment, from a subjective point of view, of an individual who feels satisfied with a certain situation. Consequently, consumer happiness refers to the emotions that are related to consumption activities that are satisfying (Zhong and Moon 2020). In some studies, the practice of consumption has been shown to increase people's happiness (Dunn et al. 2011; Kim and Lee 2020). Thus, the shopping experience, or a particular consumption-related experience, can bring happiness to customers, and to achieve greater happiness, customers may repeatedly engage in such activities (Zhong and Moon 2020). In this sense, making a consumer happier can be a good marketing strategy for a company (Baumeister et al. 2013).

2.6 Consumer Satisfaction - CS

Satisfaction is the measure of how well a product or service provided by a company meets or exceeds customer expectations (Budi et al. 2021). It can be defined as the difference between expectations before consumption of the product and the attitude toward the product's performance after consumption (Giao et al. 2020).

Therefore, on the consumer's part, satisfaction constitutes a positive reaction regarding the results of previous experience (Chinomona 2013; Budi et al. 2021).

Previous research has shown that satisfaction is often considered as an important determinant of intention to repeat purchase (Liao et al. 2009). It is thus considered that if a company can satisfy its customers' needs better than its competitors, it will be easier to achieve their loyalty (Moreira et al. 2015). In this sense, customer satisfaction is one of the most important aspects for the success of a business (Nguyen et al. 2021) and is the main goal of every brand (Budi et al. 2021).

3. Research Hypotheses

Based on the literature review, the following hypotheses were designed:

H1: "Online brand relationship" has a positive and significant influence on "consumer happiness with the experience".

H2: "Online brand experience" has a positive and significant influence on "consumer happiness with the experience".

H3: "Consumer happiness with the experience" has a positive and significant influence on "Consumer satisfaction".

H4: "Consumer time availability" has a moderating effect on the relationship between online brand relationship and online brand experience and consumer happiness with the experience.

4. Methods

Four hypotheses were tested using an online survey collected in May 2021. A convenience sampling method was used, and respondents were invited to complete a link from the google forms platform.

All constructs were measured in a response format of a five-point Likert scale ranging 1 from (strongly disagree) to 5 (strongly agree) and adapted from previous studies: online brand relationship (Veloutsou (2007), online brand experience (Christodoulides, De Chernatony, Furrer, Shiu, and Abimbola (2006); Parasuraman, Zeithaml, and Malhotra (2005), happiness with the experience (Bhattacharjee and Mogilner (2013), consumer satisfaction (Rose, Clark, Samouel, and Hair (2012), and time availability (Etkin, Evangelidis, and Aaker (2015).

PLS-SEM using Smart PLS was used to carry out data analysis. PLS-SEM is a robust modeling technique, with few identification issues and well-suited for testing the strength of relationships between latent variables and when the sample size ($n = 123$) is relatively small (Hair, Black, Anderson, & Babin, 2018). It followed a two-step approach: (1) the reliability and validity of the measurement model was assessed, and (2) the structural model was evaluated (structural relations among the latent factors) (Wynne W Chin, 2010).

5. Principal Results

Most of the respondents is female (67.5%) and between 18 and 25 years old (64.2%). When the respondents were asked their preferred online platform for restaurant information/booking, the most popular was Tripadvisor (30%), followed by Google (23.6%).

Online brand relationship ($\beta = 0.229$, $p < 0.05$) and online brand experience ($\beta = 0.384$, $p < 0.001$) show a significant and positive influence on consumer's happiness with the experience, respectively, supporting hypotheses 1 and 2. Moreover, happiness with the experience was seen to have a positive and significant effect on consumer satisfaction ($\beta = 0.499$, $p < 0.001$), supporting hypothesis 3.

To test H4, we assessed the moderating effect of consumers' time availability on the relationship between online brand relationship and online brand experience and consumers' happiness with the experience, using the product indicator approach (W. W. Chin, Marcolin, & Newsted, 2003). Findings show that consumer's time availability has a moderating effect on the relationship between online brand experience and consumer's happiness with the experience, partially supporting hypothesis 4.

6. Conclusions and Discussion

In the literature it has been found that a positive experience with a brand can have several consequences which are also positive. The relationship with the brand can also involve positive outcomes. In this study consumer

commenting platforms such as Tripadvisor were assumed as brands. And so, the experience and relationship that can be established with these platforms was analyzed.

The results showed that the online brand experience and the online brand relationship had a positive effect on online happiness experience with the online platform and that lead to a positive consumer satisfaction. In this context, a brand experience, and a relationship with the brand, both positive, can result in a feeling, also positive, or happiness, because it is associated with a satisfactory use of these platforms (Zhong and Moon 2020).

It was also possible to prove that happiness with the experience had a positive influence on consumer satisfaction. Since the concept of happiness is a higher level of customer satisfaction (Alexander 2010), it is natural that this positive feeling results in a feeling of consumer satisfaction.

Other interesting result was the moderate effect of the time availability that in the absence of time can negative effect the relation the online brand experience and the online brand happiness with the food app.

Although indirectly, it is possible to resume the perspective of other researchers who argue that the experience can have a positive effect on customer satisfaction (Ha and Perks 2005), and that the relationship with the brand can also have a positive effect on that satisfaction (Budi et al 2021).

6.1 Theoretical Implications

Despite the numerous studies that have been conducted on online consumer behavior, research on consumer rating platforms is scarce. In this context, the present study contributes to fill this gap by analyzing consumers' attitudes towards these platforms.

This study also addresses the concept of happiness in the context of brand experience and the relationship between brand and consumer, both of which are essential topics in the context of academic research.

6.2 Practical Implications

With the existence of a wide variety of apps available to collect information about restaurants and their reservation, it becomes essential to try to stand out by the ease of search, speed of delivery of information, variety of information available, content available, variety of available establishments, as well as the promotions that some of these platforms offer to attract their users trying to gain a competitive advantage.

Given this, it becomes necessary to know to what extent consumers know the online platforms available for collecting information and booking restaurants, and more, to what extent consumers trust the online platforms and what factors influence this trust (Cheng, Fu, Sun, Bilgihan, & Okumus, 2019; Xiao, Zhang, & Fu, 2019).

6.3 Limitations and Future Research

Despite the contribution of this study, some limitations should be pointed out, namely regarding the sample. In this context, we must point out the limitation of the sample in the number of individuals and in the diversity of age groups, since it was essentially composed of young people.

Future research should, firstly, use larger and more diverse samples in terms of age groups. Secondly, studies could be conducted on other countries in order to broaden the conclusions drawn.

References

- Alexander, M.W. (2010). "Customer Delight: A Review", *Academy of Marketing Studies Journal*, 14, 39-54.
- Bhattacharjee, A., & Mogilner, C. (2013). Happiness from Ordinary and Extraordinary Experiences. *Journal of Consumer Research*, 41(1), 1-17. doi:10.1086/674724
- Cheng, X., Fu, S., Sun, J., Bilgihan, A., & Okumus, F. (2019). An investigation on online reviews in sharing economy driven hospitality platforms: A viewpoint of trust. *Tourism Management*, 71, 366-377. doi:<https://doi.org/10.1016/j.tourman.2018.10.020>
- Chin, W. W. (2010). How to write up and report PLS analyses. In V. E. Vinzi, W. W. Chin, J. Henseler, & H. Wang (Ed.), *Handbook of partial least squares* (pp. 655-690): Springer.
- Chin, W. W., Marcolin, B. L., & Newsted, P. R. (2003). A Partial Least Squares Latent Variable Modeling Approach for Measuring Interaction Effects: Results from a Monte Carlo Simulation Study and an Electronic-Mail Emotion/Adoption Study. *Information systems research*, 14(2), 189-217. doi:10.1287/isre.14.2.189.16018
- Christodoulides, G., De Chernatony, L., Furrer, O., Shiu, E., & Abimbola, T. (2006). Conceptualising and Measuring the Equity of Online Brands. *Journal of Marketing Management*, 22(7-8), 799-825. doi:10.1362/026725706778612149

- Etkin, J., Evangelidis, I., & Aaker, J. (2015). Pressed for Time? Goal Conflict Shapes how Time is Perceived, Spent, and Valued. *Journal of Marketing Research*, 52(3), 394-406. doi:10.1509/jmr.14.0130
- Hair, J. F., Black, W. C., Anderson, R. E., & Babin, B. J. (2018). *Multivariate Data Analysis*: Cengage.
- Parasuraman, A., Zeithaml, V. A., & Malhotra, A. (2005). ES-QUAL: A multiple-item scale for assessing electronic service quality. *Journal of Service Research*, 7(3), 213-233.
- Rose, S., Clark, M., Samouel, P., & Hair, N. (2012). Online Customer Experience in e-Retailing: An empirical model of Antecedents and Outcomes. *Journal of Retailing*, 88(2), 308-322. doi:<https://doi.org/10.1016/j.jretai.2012.03.001>
- Veloutsou, C. (2007). Identifying the Dimensions of the Product-Brand and Consumer Relationship. *Journal of Marketing Management*, 23(1-2), 7-26. doi:10.1362/026725707X177892
- Xiao, L., Zhang, Y., & Fu, B. (2019). Exploring the moderators and causal process of trust transfer in online-to-offline commerce. *Journal of Business Research*, 98, 214-226. doi:<https://doi.org/10.1016/j.jbusres.2019.01.069>

Collective Action on Facebook and Telegram During the Russia–Ukraine War

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Abstract: Social media have been used for political bottom-up organizing and collective action since at least the Arab Spring protests. Social media provide unique affordances that reduce the costs of collective action facilitating anonymous communication and cooperation at a much larger scale than ever before. The Russian invasion of Ukraine provides multiple examples of social media use for collective action. In this conflict, social media platforms, most prominently Facebook and Telegram have been actively employed by Ukrainians as places for organisation, volunteering and gathering support from a variety of volunteers both inside the country and abroad. After nine months of the war, it can safely be said that volunteering has played a huge role in the resistance to Russian aggression. However, little is known about how collective action has been organised on social media during this conflict. This paper aims to advance knowledge on the subject by focusing on how different forms of collective action have been organized on two widely used platforms: Facebook and Telegram. Based on the qualitative analysis of the profiles engaged in the organisation of collective action on Facebook and Telegram we discuss common features and differences between activists on both platforms. Different approaches to the organisation of pages, groups, and channels (including user engagement, interaction, and reporting) are discussed. The theory of affordances is used as a theoretical lens in analysing how the design of Facebook and Telegram allow and constrain certain types of collective action. The paper aims to contribute to the understanding of online collective action and bottom-up organisation on Facebook and Telegram.

Keywords: Collective Action, Affordances, Facebook, Telegram, Russian-Ukrainian War, Fundraising

1. Introduction

Since the beginning of the full-scale Russian invasion of Ukraine on February 24, 2022, there has been a meteoric rise in volunteer efforts to counter the overwhelming force. Thousands of people joined territorial defence forces and self-organised various groups (from food supply to makeshift weapons production) to support the fighters (Ioanes, 2022). Concurrently with the rise of offline volunteer movements, the mobilisation has been also happening online, with online communities rallying to collect support for Ukraine forces and citizens. Online communities and volunteer organisations were already in place, established in the years following the start of Russian aggression in 2014. In fact, social media (SM) played a significant role in the protests leading to the toppling of the Yanukovich regime in 2014 (Ronzhyn, 2014; MacDuffee Metzger and Tucker, 2017). After that, many of the profiles on SM continued operating in the context of the Russia-Ukraine conflict in the east of Ukraine (Worschech, 2017). Nonetheless, the 24th of February marked an abrupt and dramatic increase in activity related to the profiles.

Come Back Alive Foundation¹, by far the largest army-focused charity organisation in Ukraine had its supporters' total pledge on Patreon increase in just one day from 100 thousand to more than 500 thousand US dollars before its account was suspended by Patreon. Come Back Alive's Facebook page gained 74.8 thousand new followers just in one day on February 25. A similar increase can be observed in other humanitarian-related or volunteer pages and groups. The increase in subscriber numbers is only dwarfed by the amount of money collected. Come Back Alive collection for the whole year of 2021 amounted to 21 million hryvnias (approx. € 700 000). Since February 2022, they were raising multiples of that amount weekly (from 1 454 million in the first week of war² to 92 million in the first week of November³). Moreover, many pages that had never organised fundraisers before (specifically, pages of celebrities) also collected substantial amounts of money for humanitarian and army purposes.

¹ <https://www.comebackalive.charity/>

² <https://savelife.in.ua/report>

³ <https://www.facebook.com/backandalive/posts/pfbid0Ppa8axF8huTzNyVJm5TmQ6MHphJqrXKyAwDX61hhPy969u8W2m1aLNPvGn77Z5hal>

Overall, the volunteer activity and fundraising efforts have been unprecedented, making it an interesting case for SM researchers. In this early study, we aim to describe the activity on two social networks (Facebook and Telegram) related to the war effort and discuss it in the context of collective action and technological affordances.

The remainder of the paper is structured as follows: in the following section, we discuss two theoretical theories employed in the paper: collective action and affordances. In section 3 the methodological approach is presented. Sections 4 and 5 present the results of the analysis and discuss the implications of the findings. The paper ends with the conclusions section that summarizes the research findings.

2. Theoretical background

2.1 Collective action

The research on collective action (CA) was sparked by Mancur Olson's seminal work, in which he described how group action is different to individual action, as it requires agreement between individuals, each with their own interest in mind (Olson, 1965). Olson also made several observations regarding the success of CA: for example, that smaller and more homogenous groups tend to be more effective than larger groups. The main reason for that is lower decision-making costs, and lower cost of monitoring and communication (Olson, 1965). These observations held up well over the years until significant advantages in communication technology were made and the Internet proliferated widely (Bimber, 2017).

The Internet offered unique advantages for the organisation of CA: drastically reduced communication costs, wider reach, mitigating or eliminating the disadvantages of the larger group in Olson's model (Lupia and Sin, 2003). Web 2.0 and SM are even more conducive to large-scale organizing: by making contacting people and disseminating information about the cause easier. There are numerous examples of Internet-based CA both political and non-political in their nature (Bimber, Flanagin and Stohl, 2005; Dolata and Schrape, 2016), with SM, in particular, playing a significant role in protest action and self-organized activism over the recent decade (Lee, 2015; Ruijgrok, 2017; Besta et al., 2019).

While some authors (Bimber, Flanagin and Stohl, 2005) suggest that the Internet changed some of the conditions in which CA is organised (i.e., lowered communication costs) and led to changes in some aspects of Olson's CA, others (Bennett and Segerberg, 2012) suggest that the Internet and online interaction allow talking about a different logic altogether: the connective action, which in contrast to CA, is not associated with high levels of organisational resources and formation of collective identities.

In our case, the ultimate goal of wartime online activism in Ukraine is offline action: the conversion of donations made mostly through the Internet into food, humanitarian items, weapons, and vehicles. The CA is organised by groups (formal and informal) that share a common goal (helping Ukraine) and are manifested through the profiles on SM. In the paper we discuss specific SM profiles, however, the groups behind the profile may have distinct representations both online (on different platforms) or offline (as formal charity organisations), which we must consider discussing the topic.

2.2 Technology affordances

The concept of affordance was coined by Gibson (1977, p. 75) who defined it as a "unique combination of qualities that specifies what the object affords us". The concept was applied to different fields, most notably product design (Norman, 1988) and subsequently to communication (Hutchby, 2001) as a way to describe how technologies enable and constrain specific actions of the users. Applied to SM, affordances can be defined as "perceived actual or imagined properties of the technological products, emerging through the relation of technological, social and contextual, that enable and constrain specific uses of the platforms" (Ronzhyn, Cardenal and Batlle Rubio, 2022, p. 14). Such properties can be general: persistence, anonymity or visibility (Treem and Leonardi, 2013; Evans et al., 2017) or specific: content association, feedback directness and audience transparency affordances related to self-presentation on SM (Devito, Birnholtz and Hancock, 2017). Affordances provide a useful theoretical lens for studying SM as they acknowledge the complex interplay between the users and the system, rather than focusing solely on the system function (Nagy and Neff, 2015). There have been case studies of particular movements aimed at describing the SM affordances related to CA: Sæbø et al. (2020) and Harindranath et al. (2015) each identified nine affordances supporting CA; Vaast et al. (2017) distinguished between individualized, collective, shared and connective affordances of SM; Zheng and Yu (2016) outlined two

general SM affordances for CA: agenda setting and framing. The drawbacks of these studies are that (1) they tend to conflate affordances with the actualisation of affordances (see for example Evans et al. (2017) for discussion on that) and (2) they treat SM as a monolith phenomenon, failing to recognize the differences between SM platforms. Comparative research or research examining a specific platform is relatively scarce: Valenzuela et al. (2018) showed that when organising protest action, Facebook is used for communication with strong ties, while Twitter is used to influence weak ties; Ahuja et al. (2018) found that affordances of a SM platform can predict the success of CA, depending on its objectives. Papers discussing Telegram and CA are rare and explore mostly its use in political protests: e.g., Hong Kong 2019 protests (Urman, Chun-ting Ho and Katze, 2020), Belarus 2020 protests (Wijermars and Lokot, 2022).

In this study, we avoid talking about SM in general and instead use affordances as a way to show the differences between Facebook and Telegram concerning the organisation of CA and show how the platforms afford (and constrain) the organisation and realisation of specific types of CA in the wartime.

2. Methodology

The two SM platforms discussed in the paper are Facebook and Telegram. Facebook is by far the most popular social network in Ukraine with 61% of Internet users using the platform (only 7% use Twitter) (Statista, 2021). Simultaneously, Telegram has been enjoying a rapid rise in popularity before the war: 20% share in 2021 (Statista, 2021), and subsequently gained even more users afterwards (Allyn, 2022; Detector Media, 2022).

In this study, we adopt a qualitative approach to the analysis of profiles organizing CA on the two platforms. For Facebook, we aimed to include all popular public profiles (pages and groups with at least 10 000 followers), actively engaged in CA. The profiles were found through keyword search and by following references in the posts of already identified pages. As the number of such profiles is low and they are quite visible, it is likely that we were able to find all the profiles fitting our inclusion criteria. Facebook in contrast to Twitter does not provide open access to information about user connections and user posts in personal profiles, thus making social network analysis impossible and limiting quantitative analysis generally. In our case, however, we were more interested in how the profiles managed the affordances of Facebook and how they built up their communication, rather than in the audience of the profiles.

Table 1: Facebook and Telegram profiles analysed

Facebook profiles	Followers	Telegram channels	Subscribers
Come Back Alive	3,5 M	IT ARMY of Ukraine	210 687
Serhiy Zhadan ⁴	162 362	Babchenko	92 410
Razom for Ukraine	48 803	DDoS po Krayini separiv	48 038
Fond Serhiya Prytuly	36 422	Kiberpalyanitsya	7 985
Hospitallers Paramedics	32 820	INCOURSE#911	6 027
Dorje Batuu	27 431		
Pidtrymai Armiyu Ukrayiny	11 987		
Andriy Lyubka	11 442		
Armiya SOS [group]	33 467		

We have analysed 9 Facebook profiles (eight pages and one group) (listed in Table 1), focused on fundraising for the army and/or humanitarian purposes in Ukraine and having at least 10 thousand followers. CrowdTangle⁵ tool was used to collect the information from the profiles and extract posted content, together with additional quantitative information like the number of reactions, comments, and shares, reported alongside the qualitative findings. The timespan is the nine-month period from 23/02/2022 (one day before the war) to 23/11/2022.

⁴ Transliteration is used for some of the pages with Ukrainian names.

⁵ <https://www.crowdtangle.com/>

Profile statistics and trends were collected in November 2022, thus any posts deleted by that point are not included in the dataset.

Speaking of limitations, CrowdTangle (and Facebook more generally) does not allow automated access to posts published by the profiles of individuals, who do not have a checkmark of “an official page”. Some volunteers chose to forgo this status and still have a personal profile while publishing to tens of thousands of followers. Authors saw at least four such high-profile individuals with 10–50 thousand followers, who engage in fundraising and collecting support for Ukrainians. These profiles were not included in our analysis; however, they are important contributors to the volunteer movement.

Additionally, we investigated several Telegram profiles (listed in Table 1) that engage in the organisation of CA with at least 5 thousand followers. There is no equivalent Telegram tool for the analysis, so the telegram channels were found using snowball sampling, where new channels were identified through the analysis of the content of the channels in the sample. Such a sampling method allows us to make no claim for the comprehensiveness of the analysis (Parker, Scott and Geddes, 2020) but enables to see the variety of channels working within the topic. One of the researchers joined each of the analysed channels, read and used it for several weeks, which allowed him to develop a qualitative assessment of the functions and organisation of the channel.

3. Findings

3.1 Facebook: large-scale fundraising

Fundraising is by far the most common action organised on SM at the time of war, all of the analysed profiles engaged in fundraising on Facebook. Most profiles already existed before the war started. In our sample, only one profile (*Fond Serhiya Prytuly*) was created after February 24. Charity organisations existed because there was ongoing warfare in the east of Ukraine, while celebrity profiles existed as a means for authors to get in touch with their audience. Still, all profiles grew their audience more rapidly after the start of the war. Most profiles achieved their most substantial growth in the first week of the war (23/02 – 02/03), the mean increase in followers is 2.71%, with the highest increase of 8.78%. Several observations can be made based on the analysis of the data regarding the use of Facebook functions and the content created by the profiles.

Overall, two clear groups of profiles can be defined in terms of the number of user interactions. The first group are organisations (*Come Back Alive*, *Razom*, *Hospitallers*, *Pidtrymai Armiyu Ukrayiny*, *Armiya SOS*), they have a weekly interaction rate well below one percent (mean = 0.8%), meaning that less than 1 percent of followers interact with at least one post (react, share, comment) during an average week. The second group are individual profiles of celebrities that have a far larger percentage of followers who interact with their posts, 4.16% on average, with one profile (*Dorje Batuu*) achieving a 7.98% interaction rate. *Fond Serhiya Prytuly* although officially a fund has an interaction profile more similar to celebrity (4.37%), due to its initially low number of followers and also a clear celebrity at the head of the fund (whose name it bears).

“Like” is the most popular reaction (70.6% of all interactions), followed by “love” (8%) and “care” (6.7%) reactions. All other reactions rarely cross the one percent mark, except for the “sad” reaction for *Come Back Alive*’s (5.6%) and *Hospitallers* (2.6%) posts. These posts are usually the reports about the killed volunteers or army men, which also attract “angry” reactions, although to a lesser degree (0.4 and 0.7% respectively).

Content-wise there is a clear predominance of visual content. Most posts in all the profiles contain images (post type “photo” on Facebook). Photos on average however were not the most popular posts. Posts containing videos attracted more attention from users. For 6 out of 8 profiles that used videos, video posts had more interactions than photo posts. For two of the three celebrities (who are all writers), statuses also garnered more interactions than photos.

Facebook tagging is successfully used by some profiles (*Razom*, *Armiya SOS*) as a promotion strategy. Tagging other popular pages contributed to the popularity of posts and allowed the profiles to attract new followers.

Regarding the content of the posts published by the profiles, three observations can be made:

1. Posts related to war were more popular. *Razom*, a US-based fund, the only page not based in Ukraine did not publish as many posts directly set in Ukraine and received fewer interactions. The most popular posts on the page were related to the happenings in Ukraine (e.g., results of the use of the fund’s money in the field).
2. In general, in their calls for donating and in reporting, profiles tend to focus on people. Posted photos most frequently depicted people: even in reports when the acquired equipment is shown, people are

photographed posing near it. Similarly, there are posts depicting the day-to-day life of celebrities or organisations' workers.

3. Accountability and transparency crucial in fundraising initiatives are realised through regular reports on the use of raised money. Profiles clearly state the purpose of the fundraising and recipients of help. In the case of fundraising for a specific item, the required sum is also indicated. Reports are posted regularly to show where the raised money is going (*Come Back Alive* posts weekly reports, *Hospitallers* upon delivery of each batch of equipment, *Serhiy Zhadan* posts after each event). In case of a large goal, interim reports are posted to raise awareness and attract more donors. In their format, reports are formal for organisations (extreme example: *Come Back Alive* with very detailed weekly reports) and much more casual for celebrities (*Serhiy Zhadan*, *Dorje Batuu*).

3.2 Telegram: cyberwarfare

Telegram has two types of profiles: channels and chats. Channels are similar to Facebook pages: the owner posts messages, while the followers may have the ability to comment on the messages; while in chats everyone can post messages in the same feed. Chats are a popular function of Telegram and often channels use chats for additional discussion and support. In contrast to Facebook, which is primarily used for fundraising and resource gathering, Telegram serves a different purpose. Because of the most prominent affordances that Telegram provides (anonymity and lack of central moderation/ censorship), it was chosen as a venue for any action that is illegal, legally grey or otherwise not permitted on Facebook.

Telegram groups are used for cyberwarfare: coordinating and organising cyberattacks on Russian websites and services. Most of these groups are aimed at helping people participate in large-scale DDoS (distributed denial-of-service) attacks: explaining how to install the software on their personal computer or server and providing technical support if any problems or questions arise. There are several groups with the same purpose (many with fewer than 5 thousand followers so outside our sample), created likely to minimise damage in case of an external threat (i.e., group overtake or deletion). These groups largely follow the same general theme; however, they do offer different software and aim at different targets at any given time. Some groups also involve their members in software development through GitHub, thus offering a different way of participating in the cyberwar.

As Willet (2022) notes, the war revealed key weaknesses in Russian cyber capabilities, stemming from a lack of private-sector support. The most common type of attack remains DDoS; it requires the least technical expertise from its agents and aims at exhausting the target's resources by flooding the website with errant traffic. It is worth noting that Russia also actively uses DDoS attacks on Ukraine services and its allies (the Estonian parliament and newspapers are some examples of the targets) (Willet, 2022). Still, by itself, DDoS is a relatively short-lived attack, which leads only to temporary disruption of services (which however may be costly for the targeted organisation).

Telegram groups provide regular reports of the DDoS successes, however, no information about the number of active attackers is provided. Still, the number of a group's active users is available in Telegram: in the case of the DDoS groups, the average percentage is 30.4% (309 to 5 690 in absolute numbers).

There is only one fundraising Telegram profile, whose numbers in terms of self-reported amounts of money collected rival the top Facebook profiles. Babchenko, a former journalist, is a popular figure who has been repeatedly banned by Facebook and therefore moved to Telegram, where he maintains an active account (93 thousand subscribers as of the end of November). The reported amount of money collected is comparable with top celebrity profiles on Facebook. In terms of content, the channel is less restrained and more radical in terms of language, both in posts and in the comments. Otherwise, the calls for action and reports are very similar to those published on Facebook with detailed reporting and reliance on photos as evidence for the use of funds.

4. Discussion: affordances supporting collective action

From the point of view of affordances theory, Facebook and Telegram offer different affordances to their users. Platforms' affordances allow and constrain users' behaviours. These behaviours in terms of CA are described in the previous section, while in this section we explain, based on our analysis of the profiles, how they are linked to the affordances of the two platforms. Following four affordances can be identified from the literature: visibility, persistence, editability, and association (Treem and Leonardi, 2013); these are high-level affordances

which can be present on a particular platform to a greater or lesser degree (Ronzhyn, Cardenal and Batlle Rubio, 2022).

Through its affordances of *visibility* and *persistence*, Facebook offers significant benefits for organisations doing fundraising: allowing more transparency and accountability, and improving the organisational image and perception of the organisation by the donors (Di Lauro, Tursunbayeva and Antonelli, 2019). All the charity organisations in our sample take advantage of this by posting regular reports including both the amounts received and items bought and given out. Regular reports also provide feedback about the participation of others in the campaign and thus serve the purpose of attracting more donors (Margetts *et al.*, 2011) aided by users sharing the reports. The *persistence* of the content posted on Facebook allows potential donors easily check the history of the profile and establish its trustworthiness. The affordance of *association* is actualised in two ways: firstly, through the tagging function: when pages tag other pages and by that confirm their legitimacy and increase visibility; and secondly by visualising the follower counts and shares, showing the breadth of support for a profile.

The biggest difference between Facebook and Telegram affordance-wise is the much more anonymous nature of Telegram (*anonymity* as a specific realisation of *visibility* affordance (Hollenbaugh, 2021)). This difference is not so much functional as the difference in expectations of the platform and its users, and in the philosophy of the platform itself (Wijermars and Lokot, 2022): the contextual difference shaping the affordance of Telegram. As Telegram uses a much more lax moderation approach and some parts of it are not externally moderated at all (private groups), channels tend to be much more permissive when it comes to questionable content (hate speech, graphic content) as channel and group moderators decide what is acceptable. This leads to the moderators being able to organise the discussion the way they like in terms of (in-)civility (Urman and Katz, 2022) and to orchestrate legally grey or illegal CA. Telegram's *association* affordance helps create networks of channels and chats linked with one another, while *editability* affordance manifested through an open API of Telegram, allows the creation of customised and complex experiences for the groups' followers. The presence of these affordances on Telegram is what made many users and activists in Ukraine choose Telegram over the much more popular Facebook.

5. Conclusions

The analysis conducted in the paper contributes to a better understanding of the biggest Facebook profiles engaged in CA at the time of war as well the use of Telegram for CA. As it often happens during disasters (Okada, Ishida and Yamauchi, 2017), the start of the war greatly increased online activism in Ukraine. The two most widely used platforms, Facebook and Telegram are used by different actors and for different purposes. Facebook is used by charity organisations and celebrities who through the platform's affordances of visibility and association establish their legitimacy and promote fundraising. Telegram on the other hand is used for organising cyberwarfare, including illicit actions. Taking advantage of the anonymity affordance, Telegram profiles coordinate CA, which would be not possible on more visible platforms like Facebook or Twitter.

The paper opens several avenues for future research. Subsequent papers can investigate the content of the messages shared and their correlation with CA success. Telegram CA analysis can also be strengthened by discussing a larger sample of channels, including those with lower number of more tightly cooperative participants, which are difficult to find using a snowballing method employed in this paper. Finally, cross-platform comparison can be developed, going beyond the two platforms discussed here.

References

- Ahuja, M., Patel, P. and Suh, A. (2018) 'The Influence of Social Media on Collective Action in the Context of Digital Activism: An Affordance Approach', in *Proceedings of the Annual Hawaii International Conference on System Sciences*, pp. 2203–2212. doi: 10.24251/HICSS.2018.275.
- Allyn, B. (2022) *Telegram is the app of choice in the war in Ukraine despite experts' privacy concerns*, NPR. Available at: <https://www.npr.org/2022/03/14/1086483703/telegram-ukraine-war-russia> (Accessed: 24 November 2022).
- Bennett, W. L. and Segerberg, A. (2012) 'The logic of connective action: Digital media and the personalization of contentious politics', *Information Communication and Society*, 15(5), pp. 739–768. doi: 10.1080/1369118X.2012.670661.
- Besta, T. *et al.* (2019) 'Multiple group membership and collective actions of opinion-based internet groups: The case of protests against abortion law restriction in Poland', *Computers in Human Behavior*, 95, pp. 94–100. doi: 10.1016/j.chb.2019.01.025.

- Bimber, B. (2017) 'Three Prompts for Collective Action in the Context of Digital Media', *Political Communication*, 34(1), pp. 6–20. doi: 10.1080/10584609.2016.1223772.
- Bimber, B., Flanagin, A. J. and Stohl, C. (2005) 'Reconceptualizing Collective Action in the Contemporary Media Environment', *Communication Theory*, 15, pp. 389–413. doi: 10.1111/j.1468-2885.2005.tb00340.x.
- Detector Media (2022) *The use of Telegram in Ukraine rises 8-fold in the times of war, DM Media Sapiens*. Available at: <https://ms.detector.media/sotsmerezhi/post/29684/2022-06-17-korystuvannya-telegram-v-ukraini-za-chasy-viyny-zbilshylos-u-8-raziv/> (Accessed: 24 November 2022).
- Devito, M. A., Birnholtz, J. and Hancock, J. T. (2017) 'Platforms, people, and perception: Using affordances to understand self-presentation on social media', in *Proceedings of the ACM Conference on Computer Supported Cooperative Work, CSCW*, pp. 740–754. doi: 10.1145/2998181.2998192.
- Dolata, U. and Schrape, J.-F. (2016) 'Masses, Crowds, Communities, Movements: Collective Action in the Internet Age', *Social Movement Studies*, 15(1), pp. 1–18. doi: 10.1080/14742837.2015.1055722.
- Evans, S. K. et al. (2017) 'Explicating Affordances: A Conceptual Framework for Understanding Affordances in Communication Research', *Journal of Computer-Mediated Communication*, 22(1), pp. 35–52. doi: 10.1111/jcc4.12180.
- Gibson, J. J. (1977) 'The concept of affordances', in Shaw, R. and Bransford, J. (eds) *Perceiving, Acting, and Knowing: Toward an Ecological Psychology*. New York, USA: John Wiley & Sons, pp. 67–81.
- Harindranath, G., Bernroider, E. W. N. and Kamel, S. H. (2015) 'Social media and social transformation movements: The role of affordances and platforms', in *23rd European Conference on Information Systems, ECIS 2015*, pp. 0–12.
- Hollenbaugh, E. (2021) 'Self-Presentation in Social Media: Review and Research Opportunities', *Review of Communication Research*, 9, pp. 80–98. doi: 10.12840/ISSN.2255-4165.027.
- Hutchby, I. (2001) 'Technologies, Texts and Affordances', *Sociology*, 35(2), pp. 441–456. doi: 10.1177/s0038038501000219.
- Ioanes, E. (2022) *Ukraine's resistance is built on the backs of volunteers, Vox*. Available at: <https://www.vox.com/2022/2/26/22952073/ukraine-civilian-volunteers-kyiv-war-effort> (Accessed: 24 November 2022).
- Di Lauro, S., Tursunbayeva, A. and Antonelli, G. (2019) 'How Nonprofit Organizations Use Social Media for Fundraising: A Systematic Literature Review', *International Journal of Business and Management*, 14(7), pp. 1–22. doi: 10.5539/ijbm.v14n7p1.
- Lee, F. L. F. (2015) 'Internet, citizen self-mobilisation, and social movement organisations in environmental collective action campaigns: two Hong Kong cases', *Environmental Politics*, 24(2), pp. 308–325. doi: 10.1080/09644016.2014.919749.
- Lupia, A. and Sin, G. (2003) 'Which Public Goods are Endangered?: How Evolving Communication Technologies Affect The Logic of Collective Action', *Public Choice*, 117(3/4), pp. 315–331. doi: 10.1023/B:PUCH.0000003735.07840.c7.
- MacDuffee Metzger, M. and Tucker, J. A. (2017) 'Social Media and EuroMaidan: A Review Essay', *Slavic Review*, 76(1), pp. 169–191. doi: 10.1017/slr.2017.16.
- Margetts, H. et al. (2011) 'Social information and political participation on the internet: an experiment', *European Political Science Review*, 3(3), pp. 321–344. doi: 10.1017/S1755773911000129.
- Nagy, P. and Neff, G. (2015) 'Imagined Affordance: Reconstructing a Keyword for Communication Theory', *Social Media + Society*, 1(2), pp. 1–9. doi: 10.1177/2056305115603385.
- Norman, D. A. (1988) *The psychology of everyday things*. New York, USA: Basic Books.
- Okada, A., Ishida, Y. and Yamauchi, N. (2017) 'Effectiveness of Social Media in Disaster Fundraising', *International Journal of Public Administration in the Digital Age*, 4(1), pp. 49–68. doi: 10.4018/IJPADA.2017010104.
- Olson, M. (1965) *The Logic of Collective Action: Public Goods and the Theory of Groups*. Cambridge: Harvard University Press.
- Parker, C., Scott, S. and Geddes, A. (2020) 'Snowball Sampling', in Atkinson, P. et al. (eds) *SAGE Research Methods Foundations*. London, UK: SAGE, pp. 0–13. doi: 10.4135/9781526421036831710.
- Ronzhyn, A. (2014) 'The use of Facebook and Twitter During the 2013-2014 Protests in Ukraine', in Rospigliosi, A. and Greener, S. (eds) *Proceedings of the European Conference on Social Media*. Brighton: University of Brighton UK, pp. 442–449.
- Ronzhyn, A., Cardenal, A. S. and Batlle Rubio, A. (2022) 'Defining affordances in social media research: A literature review', *New Media & Society*, 0(0), pp. 1–24. doi: 10.1177/14614448221135187.
- Ruijgrok, K. (2017) 'From the web to the streets: internet and protests under authoritarian regimes', *Democratization*, 24(3), pp. 498–520. doi: 10.1080/13510347.2016.1223630.
- Sæbø, Ø., Federici, T. and Braccini, A. M. (2020) 'Combining social media affordances for organising collective action', *Information Systems Journal*, 30(4), pp. 699–732. doi: 10.1111/isj.12280.
- Statista (2021) *Share of users of selected social media platforms in Ukraine in July 2021*. Available at: <https://www.statista.com/statistics/1278407/most-popular-social-media-ukraine/> (Accessed: 24 November 2022).
- Treem, J. W. and Leonardi, P. M. (2013) 'Social Media Use in Organizations: Exploring the Affordances of Visibility, Editability, Persistence, and Association', *Annals of the International Communication Association*, 36(1), pp. 143–189. doi: 10.1080/23808985.2013.11679130.
- Urman, A., Chun-ting Ho, J. and Katze, S. (2020) '"No Central Stage": Telegram-based activity during the 2019 protests in Hong Kong', *SocArXiv*. doi: 10.31235/osf.io/ueds4.
- Urman, A. and Katz, S. (2022) 'What they do in the shadows: examining the far-right networks on Telegram', *Information, Communication & Society*, 25(7), pp. 904–923. doi: 10.1080/1369118X.2020.1803946.

- Vaast, E. *et al.* (2017) 'Social media affordances for connective action: An examination of microblogging use during the Gulf of Mexico oil spill', *MIS Quarterly: Management Information Systems*, 41(4), pp. 1179–1206. doi: 10.25300/misq/2017/41.4.08.
- Valenzuela, S., Correa, T. and Gil de Zúñiga, H. (2018) 'Ties, Likes, and Tweets: Using Strong and Weak Ties to Explain Differences in Protest Participation Across Facebook and Twitter Use', *Political Communication*, 35(1), pp. 117–134. doi: 10.1080/10584609.2017.1334726.
- Wijermars, M. and Lokot, T. (2022) 'Is Telegram a "harbinger of freedom"? The performance, practices, and perception of platforms as political actors in authoritarian states', *Post-Soviet Affairs*, 38(1–2), pp. 125–145. doi: 10.1080/1060586X.2022.2030645.
- Willett, M. (2022) 'The Cyber Dimension of the Russia–Ukraine War', *Survival*, 64(5), pp. 7–26. doi: 10.1080/00396338.2022.2126193.
- Worschech, S. (2017) 'New Civic Activism in Ukraine: Building Society from Scratch?', *Kyiv-Mohyla Law and Politics Journal*, (3), pp. 23–45. doi: 10.18523/kmlpj119984.2017-3.23-45.
- Zheng, Y. and Yu, A. (2016) 'Affordances of social media in collective action: the case of Free Lunch for Children in China', *Information Systems Journal*, 26(3), pp. 289–313. doi: 10.1111/isj.12096.

Virtual Influencer Marketing: Is It Effective in Engaging Younger Generations?

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Abstract: The market value of global influencer marketing has more than doubled since 2019 (Statista, 2021). The emergence of the so-called virtual influencers (VIs) has redefined the boundaries of possibilities in this “industry” attracting the interest of many brands and raising several questions about their development, ethics, purpose in marketing and perspective. These ‘new’ social media celebrities have also attracted the attention of the scientific community but research has yet to explore how VIs are likely to reshape the practice of marketing. This study aims to better understand the attitudes and reactions of Generations Y and Z (the most attractive target group for influencers) towards VIs—in particular, to find out how VIs are perceived by younger customers and whether VIs can effectively persuade them to buy certain products. Two focus groups were conducted to facilitate an initial response to a relatively new phenomenon, and to gain a social, contextual view of the issue. Our results showed that human influencers still outperform the virtual ones for a number of reasons, ranging from the impossibility of identifying with digital creatures, the inability of the latter to demonstrate the efficacy of the products on themselves and the impossibility, expressed by many respondents, of empathising with entities that appear soulless and largely manipulated by those who—anonymously, behind their backs—are only interested in selling products.

Keywords: Virtual influencer, Marketing, Engagement, Young Consumers

1. Introduction

The media consumption patterns exhibited by younger consumers are fundamentally different from those of older generations (Haenlein et al., 2020). As a result, marketers are forced to look for an alternative way to engage with this ‘moving’ target and are increasingly finding allies in social media influencers whose endorsements help brands extend their reach and generate leads (Silva et al., 2020). Global influencer marketing has more than doubled its market value since 2019 and has expanded to other platforms (e.g., TikTok) in addition to Instagram, which still holds the leading position, with 3.8 million of brand-sponsored influencer posts (Statista, 2021).

The emergence of the so-called VIs has redefined the boundaries of possibilities in the ‘industry’ of influencer marketing (Sands et al., 2022). As they grow in popularity, these ‘new’ social media celebrities have also attracted the attention of the scientific community (e.g., Arsenyan and Mirowska, 2021; Moustakas et al., 2020; Stein et al., 2022), but research is yet to examine how VIs are likely to reshape the practice of marketing (e.g., Sands et al., 2022). How are VIs perceived by the younger generations? Are they considered as credible as their flesh-and-blood counterparts? Are they really able to inspire trust in younger audiences and to influence their purchasing process?

Given the relative novelty of the phenomenon, the study adopted a qualitative methodology. Two focus groups allowed us to find the initial answers to the research questions and to gain a better understanding of the perceptions and reactions of the younger generations towards VIs.

The results revealed a relatively low level of attraction towards VIs who are perceived as incapable of developing a socio-emotional relationship with their followers and influencing their purchasing decisions. Some concerns were also expressed about the development of the phenomenon.

2. Influencer marketing and VIs

Social media influencers (SMIs) have become an important asset for advertisers. They incorporate products—and endorsements—into posts or videos shot in real-life settings, increasing their trustworthiness as they appear to have tried the products themselves (Schouten et al., 2019; De Veirman et al., 2017). As they appear more relatable to their specific audiences, they tend to be perceived as more trustworthy and credible than conventional celebrities (e.g., Sokolova and Kefi, 2019). Previous studies have reported that the congruence between an influencer’s image and followers’ interests represents a likely determinant (Choi and Rifon, 2012;

Casaló et al., 2020), as customers establish a positive relationship with their followed influencers because they represent an idealised version of themselves or because they share similar interests (Boerman, 2020; Choi and Rifon, 2012).

Within the ever-evolving landscape of social media influencers, VIs have become increasingly popular. A VI can be ‘an entity—human-like or not—that is autonomously controlled by artificial intelligence and visually represented as an interactive, real-time rendered being in a digital environment’ (Sands et al., 2022) but can also be an avatar, an imaginary work controlled by humans (De Brito-Silva et al. 2022); that is, an ‘artificial media persona (...) that is typically characterised by a computer-generated face, which may either be connected to a digital body or superimposed on a real human body’ (Stein et al., 2022: 2).

These characters have attracted interest on behalf of many brands (Vuitton, Dior, Prada, Nike, Samsung, etc.) and have achieved great popularity (e.g., Lil Miquela has almost three 3 million Instagram followers).

Previous research has outlined the key benefits that brands can experiment with when creating (or partnering with) VIs. By working with a VI, companies are able to:

- Rely on a constantly available partner with an unparalleled ability to adapt (Conti et al., 2022).
- Create transmedia storytelling that allows a brand to tell a single-story across multiple platforms and the metaverse (Sands et al., 2022).
- Capitalise on higher engagement rates compared to human influencers and effectively capture the attention of young consumers (Naumann and Daubenbüchel, 2021).
- Create their own virtual ambassadors, ensuring that the influencers’ backstories, language, tone of voice, values and personalities are always consistent with those of the brand (Sands et al., 2022; Guthrie, 2020).
- Protect the brand’s reputation from the misconduct of human influencers and maintain complete control over the words and behaviours of VIs (Conti et al., 2022).

However, these effects—and others related to generating social conversation and driving sales (Kim and Kim, 2021)—can only be achieved if the influencer is perceived as credible, attractive, trustworthy, and knowledgeable in the field of the endorsed product (Djafarova and Rushworth, 2017). Influencer credibility is determined by two components: trustworthiness (related to perceptions of honesty, integrity and believability) and expertise (related to the relevant knowledge, competencies and skills the endorser is perceived to possess), both of which play an important role in influencing purchase behaviour (Djafarova and Rushworth, 2017), with a particular impact on product intention (Schouten et al., 2020). In addition to ‘source credibility’, studies on endorsement marketing also highlight the role of source attractiveness, which has been described as consisting of two dimensions: the physical attractiveness of the source and homophily (the perceived similarity in beliefs, values, experiences and lifestyles of the communicator by the receiver). The latter facilitates the formation of long-term trust in the follower-influencer relationship, while the former (physical attractiveness) only affects the initial follower’s judgement (Kim and Kim, 2021).

With specific reference to the physical aspect of the source, the first studies conducted on VIs discussed the potential and pitfalls of the anthropomorphic appearance of the VIs. While some streams of research argued that consumer-virtual agent interactions are considered as similar to human interactions (Edwards et al., 2019) as consumers tend to anthropomorphise machines (Feine et al., 2019), other research (Wiese and Weiss, 2020; Arsenyan and Mirowska, 2021; Sands et al., 2022), in line with the ‘uncanny valley’ model (Mori, 1970), warned of the dangers of a very human-like visual appearance of the VIs, which are frequently perceived more negatively than agents that are unambiguously human or nonhuman. In this regard, the literature has highlighted the need for creators to strike a delicate balance, adding the cues associated with human traits—which are needed to elicit sympathetic social behaviour from the followers (para-social responses)—until the right level of anthropomorphism is achieved without provoking perceptions of disorientation, fear, and creepiness (Stein et al. 2022, Sands et al., 2022; Miao et al., 2022). In addition to this challenge, VI creators must also avoid the risk of presenting unrealistic beauty standards and body-type expectations (Moustakas et al., 2020), as VIs are predominantly female. More generally, other challenges associated with VI marketing have been described in the literature (e.g., Moustakas et al., 2020) as being related to a lack of authenticity and trustworthiness, the need for large investments, challenges with legality and the risk of losing popularity due to poor execution. With regard to this last aspect, one of the key challenges is the ability to craft an engaging storyline that humanises VIs and allows them to develop an emotional connection with their followers.

3. Methodology

Given the exploratory nature of the research, a qualitative inductive methodology was adopted. Focus groups allowed for the collection of qualitative data (in terms of attitudes, feelings, experiences and reactions towards VIs) and encouraged participants to share their perceptions, facilitating joint-meaning construction. The study focused on young women as the majority of influencers target a similar female audience (Schouten et al., 2020), including avatar influencers who have a predominantly female public (De Brito-Silva et al., 2022). Two focus groups were conducted synchronously online (the table in the Appendix shows the profiles of the participants). The digital environment allowed for a number of advantages, including flexibility in scheduling discussions and the participation of individuals from remote locations (Stewart and Shamdasani, 2017). Recommendations from the literature were followed in defining the groups (Catterall and Maclaran, 2006; Morgan, 1996; Richards and Morse, 2012). The two groups consisted of 8 people each. In terms of socio-demographic homogeneity, the participants were young Italian women (who had reached the age of majority), belonging to generations Y (1981–1996) and Z (1997–2012). To avoid the risk of too much homogeneity leading to single-mindedness (or ‘groupthink’), each focus group had a mixture of Gen Z and Gen Y participants.

Before starting the discussions, both of which lasted approximately one hour and forty-five minutes, participants were assured of anonymity, with the interviewer stressing the importance of respecting each participant’s point of view. Participants were encouraged to speak freely about their perceptions and were shown three illustrative examples of VIs to prompt and stimulate discussion: *Lil Miquela*, a hyper-realistic, human-like VI; *Nonoouri*, a cartoon-like VI and *NefeLe*, who presents herself as ‘the first imperfect virtual woman’ (Table 1).

Photo and video posts from Instagram of these three VIs were used to stimulate discussion. Posts related to cosmetics and fashion were chosen because VIs most often partner with cosmetics and lifestyle brands (Moustakas et al., 2020). Instagram was chosen as the focal social media platform because it is still the most used platform by influencers (Casaló et al., 2020). In terms of the interview protocol, a ‘funnel-style’ guide was adopted, moving from broad participant-oriented questions to more specific research-oriented questions (Morgan, 2006). Following a brief general discussion about social media influencers, the VIs phenomenon was introduced. After showing the content (pictures, videos, texts) created by the three mentioned VIs, the participants were asked some open questions (e.g., ‘What are your thoughts when you see this post?’) and later asked some directed questions (e.g., ‘Would you trust?’, ‘Why?’, ‘Would you follow Lil Miquela?’, ‘Why?’).

The audio-recorded group discussions were transcribed verbatim, reconstructing the structure of the participants’ interventions, and significant shifts in tone were noted in the transcripts. The analysis proceeded through a holistic reading of the transcripts and open coding to identify the main categories in the data (Bazeley, 2013).

Table 1. The profile of the virtual influencers considered during the focus groups

Virtual Influencer		Creator	Bio	Interests/ type of posts	Collaborations	Instagram Stats (January 2023)
	Lil Miquela	Created by Brud, an American advertising agency, in 2016	Influencer, singer, activist, and digital art model. 19-year-old robot living in Los Angeles	She posts about her daily life, causes she supports (e.g., actions in favour of LGBT rights), and products she consumes	Chanel, Calvin Klein, Prada, Ikea, Samsung, etc.	1.246 posts 2,9 million followers
	Nonoouri	Created in 2018 by the creative agency Opium Effect, Munich, Germany	Created in 2018 by the creative agency Opium Effect, Munich, Germany	She follows a vegan lifestyle, doesn't wear furs, and champions sustainable fashion. She balances her platform between social good and promotion.	Louis Vuitton, Dior, Versace, Gucci, Marc Jacobs, Yves Saint Laurent, Miu Miu, etc.	1.478 posts 402.000 followers
	NefeLe	Created at the end of 2021 by three young start uppers in Turin, Italy	She defines herself as "the first imperfect virtual woman"	Her posts combine commercial content with reflections on topics related to inclusion, the beauty of imperfections and prejudices.	Apple, Sprite, etc.	63 posts 3.298 followers

4. Results

4.1 Socio-emotional connections and the (un)attractiveness of VIs

Almost all the participants found the idea of interacting with VIs unattractive. The inability to feel emotionally engaged was the main reason given to justify this response. Participants felt that they could not develop a socio-

emotional relationship with the VIs as easily as they could do with the human influencers they had chosen to follow.

There are [human] influencers who know how to relate to others, bring out their human side... and you really get the impression of talking to an acquaintance. Human influencers engage you in their life and it is as if you consider them part of your group of friends. The virtual influencer does not really attract me. (Natalia)

I think that the interaction with a virtual influencer would be much more artificial. (...) The strength of human influencers is human contact. Empathy...the influencer empathizing with followers and followers empathizing with the influencer...this builds a relationship that, however fictitious may be, favours both the fame of the influencers and their ability to promote their own ideas, the products... (Sara)

The impossibility of establishing and maintaining a socio-emotional connection with the VIs emerged as a major deterrent in the perception of most of the participants who were concerned at the idea of interacting with a 'soulless entity', created specifically for the commercial promotion of products and manipulated by a team of creators.

I would not follow Lil Miquela, because she seems too artificial to me. Even if in everything she seems a real woman, this idea springs into my head: there is no soul behind her... she is driven by those who have an interest in advertising specific products. (Natalia)

In the case of virtual influencers, we are unable to perceive the person who is steering them... I really have a distrust there regardless. Maybe I would never follow them. (Erika)

I would hardly follow a virtual influencer. The question that came to my mind watching both Lil Miquela and Noonnoouri is: do we really need to interact with... whom? Who do we interact with? (Antonella)

Participants showed that they were aware that even a human influencer is backed by a team of experts and a promotional agenda, but they were still able to identify many points of difference between a VI and a human one. The most important aspect relates to homophily, the similarity that followers perceive between their own beliefs, values and experiences and those expressed by the influencer. This feeling of affinity—between the self and a human influencer who lives 'our same problems' and believes in 'our same values'—generates greater engagement, which is also generated by the influencers' ability to interact with their followers beyond the mere presentation of a product/service, by remaining active on their accounts and posting content that conveys certain values or deals with certain topics of interest.

Some influencers advertise specific products, but at the same time address certain issues and therefore involve you on different levels than simply advertising a product. (Maria)

[Human influencers are different] because of the spontaneity of communication, the values they transmit... If they only sponsor the product, I think that not much empathy is created. Instead, I notice that some influencers, even when they do not advertise products, still try to stay active on their profile, to interact with their followers. I think this increases empathy. (Valery)

I follow some influencers, who do not just advertise a product or even their own life, but behind whom there is also something else, some cultural theme, of a slightly higher level. So, I wonder what there could be behind a robot... (Antonella)

I follow some people [human influencers] who have things in common with me. (Carla)

Human influencers take sides or they make the people who follow them think about the importance of certain topics. For example, I have seen that X [name of a human influencer] often takes sides to defend human rights. Never mind that it is probably led by a team, because in any case it is normal that there is a team behind it, but anyway people feel much more attracted, they feel much more understood by a person in the flesh, compared to the case in which a topic is treated by a robot... What could it [the robot] have ever experienced? (Serena)

Regarding value commonality, participants expressed some scepticism about posts where the VIs declared their support for certain social causes (e.g., Black lives matter, sustainability, etc.). The non-humanity of the robot influencer—and its impossibility to experience real life—was perceived as the main obstacle to verifying the consistency between stated values and actual behaviour, and this undermined the declaration of values that appeared to be instrumental in gaining public approval.

A human person puts his face into it... an actual human being who exhibits the values she believes in on her bulletin board, then will have to live consistently with those values. In the case of a robot, it seems like an ad hoc operation to get some goodwill from the public. (Erika)

Based on what emerged from the focus groups, the only reasons that would lead to following a VI were curiosity and fun, two elements that are unlikely to sustain interest in a VI.

I still see them [VIs] as unreliable: I would not trust them though I would follow one out of curiosity. (Martina)

[Virtual Influencers] are somewhat comparable to the commercials of the past decades. For example, there was an advertisement for a detergent whose protagonist was a cartoon, a little man, not a natural person. I was a child, but I remember it was fun. There was this aspect of lightness. Probably a virtual influencer conveys a certain message with more levity than a flesh-and-blood one. (Valery)

4.2 Credibility of VIs and their impact on purchase decisions

With regard to the two components of the source credibility, participants did not show any particular concern about the VIs' expertise but expressed many doubts about the trustworthiness of their messages which, in their perception, was invalidated by the inability of VIs to demonstrate on themselves the effects of the products they were promoting. According to respondents, the fact that the human influencers can 'physically' try the product and show on themselves, on their own skin, the 'before' and 'after' effects of its application is important not only in terms of demonstrating the effectiveness of the product but also as a source of greater identification—and socio-emotional bonding—with the influencer.

Since we can assume that there are experts behind the virtual influencer, I believe that the knowledge does exist and that in some way it is communicated through these virtual influencers. However, they cannot have other characteristics, such as product testing, demonstration of the product's effectiveness. (Maria Antonietta)

Can a face, a physiognomy that does not actually exist, be instructive? That manga [Noonnoori] does not have dark circles, but I saw her applying eye cream. What is the point of promoting an eye contour, if you do not have problematic dark circles on which that product would act? (...) There is no a "before" and an "after" or, at least, it is not a real before and after. (Milena)

The robot is ultimately created to advertise a product/service, but (...) what does it could do with it? (...) The human influencer can demonstrate how a product/service can solve a problem of mine, can also be useful in my daily life. Many influencers show the 'before' and 'after' of the products they use... And maybe I see myself in that situation, in that action... Not in the case of the robot. (Natalia)

For me a virtual influencer is like a newspaper page (...) At least the human ones give you a sort of "demonstration". They advertise a product and show how to use it, if it works... (...) Human influencers mirror our daily lives more. Maybe they do things that we do too. I see them as more credible than the virtual ones. (Angela)

Participants' attitudes towards the idea that VIs could effectively influence their purchase process were lukewarm with many respondents indicating that they are generally not particularly influenced—for the purposes of the purchase process—even by flesh-and-blood influencers whose advice they use only as an initial input, a starting point for finding other information, or as a more important element, but when combined with other benefits (such as, a discount code to try the promoted product). On the other hand, some respondents argued that in their opinion, a human influencer remains more persuasive in the purchase process mainly because she can show her personal experience (in some cases, providing before and after pictures) and can interact with her followers, answering specific questions, providing clarifications and removing doubts.

If I had to make a purchase, I would be influenced, but not because I believe in the influencer. In general, even when I see sponsorships from human influencers, I still read other reviews before buying. I would also do the same with a product sponsored by a virtual influencer. So, there would be no difference, if I had to make a purchase. (...) Maybe, if she offered a discount code... This could be the main element to make me look for more information. (Rossana)

Human influencers have a greater ability to convince the user to buy a particular product or to try it, precisely because maybe tell what they experienced in using it or maybe they show it. Very often they also answer questions, so they could also resolve any doubts and lead the consumer to buy a particular product. I think there is a bit of a difference here. (Alexandra)

4.3 Physical appearance and the Uncanny Valley

To deepen our understanding of participant's attitudes/reactions to the different typologies of VIs (human-like and anime-like), which are capable of embodying different types of beauty, participants were exposed to images of Lil Miquela (human-like VI), Noonnoouri (anime-like VI) and Nefele ('the first imperfect virtual woman'). In most cases, the very human physical appearance of Lil Miquela was considered as destabilising and disturbing and provoked strong reaction, giving the impression of something created to deceive users' minds. In contrast, the manga appearance of Noonnoouri was generally perceived as more reassuring, less deceptive, more cartoonish (and therefore more comforting) and robotic.

The resemblance to humans scares me. (Martina)

Lil Miquela is so similar to human beings and that's pretty destabilizing. (Sara)

Lil Miquela scares me, because she looks more human. (...). I see Noonnoouri as a slightly more fun way to communicate, to advertise a product. (Maria Antonietta)

[Regarding Noonnoouri] It bothers me less than the previous virtual influencer [Lil Miquela], who has connotations much closer to a human...when they are very similar to humans...I do not find them trustworthy...this makes me think fearfully about the future, about robots, about the fact that everything is being robotized. It scares me a little. (Erika)

Noonnoouri caught my attention much more than Lil Miquela, perhaps because she seems like a nice character to me. She gets my attention and I do not feel like she is fooling my mind. In the other I see a sort of mental deception. (...) Instead, in this case I have a clear perception of what I am seeing. I am aware that I am seeing something that is not real. (Natalia)

Noonnoouri gives me less the impression that there is something/someone behind her. (Maria)

Although the physical appearance of the anime-like influencer was seen as more reassuring, this consideration did not necessarily translate into greater persuasiveness, even in the perceptions of those respondents who had expressed an appreciation—and relative preference—for this type of VI.

In terms of influence on my purchasing decisions, I do not trust this doll [Noonnoouri], as well as other animal or robot virtual influencers. (Erika)

Noonnoouri looks more like a cartoon to me. She does not inspire my confidence at all, honestly. I prefer Lil Miquela at this point if I must choose. (Angela)

While Lil Miquela reassured me (...), I do not find reality in Noonnoouri. Therefore, I could hardly be persuaded to buy, for example, an item of clothing worn by Noonnoouri. I perceive her just like a cartoon (...). I find her too detached from reality and therefore unconvincing me. (...) (Alexandra)

With reference to the physical appearance, the Instagram bio of the third VI, Nefele, generated a lot of discussion (Table 2). Nefele's declared 'imperfection' initially provoked a strong, angry reaction from some participants who saw her presentation (the 'first imperfect virtual woman', 'imperfection is beauty') as a mere attempt to gain easy consensus and the goodwill of the public, instrumentally riding the wave of a highly topical issue. Although some participants appreciated the idea of moving away from unrealistic beauty standards, they saw the risk of sending the wrong message through these words, of making people perceive as imperfection something that is not. Other participants appreciated the attempt to raise public awareness about respect for diversity and saw the communication about Nefele as a (provocative) way to achieve this goal. In the end, everyone agreed on this point: When we talk about these issues, it is never enough. VIs like Nefele can contribute to the fight against unrealistic beauty standards (to whose construction many human influencers have contributed greatly through the widespread use of Photoshop) and images like those visible in Nefele's posts and bio must be used without underlining the so-called 'imperfection' with words.

4.4 Feelings and perceptions about the present and future of virtual influencers

When participants were asked to express their perceptions and feelings about the present and future of VIs, different visions emerged. For some participants, VIs can be seen as a temporary phenomenon—driven by brands' desire to experiment with innovative solutions—that may have a greater influence on the teenage audience but generally will not have a strong impact on the purchase process.

I think Virtual Influencers can be a nice and innovative way to advertise a product, to communicate the innovative side of the brand. But I do not see them as so strategic for the success of the brand (Erika)

In my opinion, for the brand, for the brand image... VIs offer a great opportunity, because they can be leveraged on various platforms, including the Metaverse (Maria Antonietta).

In my opinion, brands are now turning to virtual influencers because they are something very "fresh", something new. Brands are experimenting with VIs to understand their effects. Then maybe the user looks at VIs' content, maybe likes that content and then does not follow them. But I am convinced that, however special these virtual influencers may be, to promote a product/service, you need to give them a soul. There must be a soul behind them. As particular as these virtual influencers may be, a product sponsored by them will never make me perceive what real influencers can make me perceive (Natalia)

Table 2. Reactions to Nefe's bio

An instrumentalization of a highly topical issue	A good idea conveyed with a wrong message	Right. I appreciate this attempt to present a realistic image	An attempt to raise awareness on important themes
- She [Nefe] bothers me a bit... because, as a virtual influencer, she was purposely created imperfect and this is clearly an exploitation (...). (Antonella) - Why do they have to remark that Nefe is imperfect? (...) Why should I consider a person with psoriasis imperfect? (...) If you highlight this, I get the message that you want to appear inclusive, but deep down you do not believe it. (Natalia) - It bothers me that the issue of imperfections almost becomes a marketing strategy. We must remember that this is a fictitious character and this makes her different from a human influencer that suffered this discrimination from society. She [Nefe] simply uses that imperfection simply to acquire followers. (Sara)	- By saying "imperfection", they underline the imperfection that is not actually there. I really struggle to understand which imperfection they refer to. The idea of creating an image different from the ones we always see is right but the message is wrong (Martina) - The only thing I noticed (...) is the fact that she had vitiligo. I do not think it is imperfection... The message ends up emphasizing something that would be normal for me to see. (Maria Antonietta) - In my opinion, it is right to create a virtual influencer who is not perfect. What is wrong is highlighting the imperfection. If you really want to 'normalize' the imperfection (...) why do you point out that there is an imperfection? (Serena)	- I like Nefe, because I see her as more real. I like her better, precisely because we are talking about an 'imperfect' woman. She has something in common with me, because I do not feel perfect, like everyone else I suppose (Carla) - Yes, we [young women] can fight as much as we want, with the idea of appreciating our defects, trivially starting from acne, but then we let ourselves be greatly influenced by unrealistic beauty standards. This imperfection [declared by Nefe] is a provocation. I like the idea. Yes, in the end, I think that everyone is exploiting, even the flesh-and-blood influencer who claims to promote the LGBT community... There is a bit of instrumentality behind it, but in this case, I do not really see much of the bad. (Erika)	- I do not see it as exploitation, quite the contrary. It is never enough...to open people's eyes. Never enough. I imagine that the goal that is behind Nefe is to subvert the image that has been proposed on social media so far. (Grazia) - Nefe wants to communicate what is imperfect according to other logic. She is not considering that vitiligo is an imperfection but imperfect is the way it is commonly experienced and considered in our society...I personally follow many girls affected by vitiligo or by other physical defects...they say that they have had a lot of difficulty in being appreciated, in our society... there are people who support them, but, unfortunately, there is a vast majority of people who still hurt them. (Erika)

Other participants expressed—with varying degrees of apprehension—the idea that VIs were a phenomenon destined to continue, even with the further development of the Metaverse, a scenario that was seen as more worrying than intriguing.

I believe that unfortunately this phenomenon will persist over time. I imagine that each of us will create an avatar, that we will go further and further, and that influencers will also have their avatar... A similar scenario scares me a lot becoming prey to everything that is not real. I think we are going to get confused, and we already do, about what is real and what is not real. Even human influencers contribute to this...how much reality is there behind an influencer who constantly posts his existence? I wonder how much reality I see in the posts that continuously advertise a lifestyle that standardizes the values that everyone has. I am scared if I think that one day my children, and future generations will be able to live exclusively on this (Grazia)

I think that the VIs phenomenon is linked to adolescence and, like all things that are done in adolescence, it is transitory in the life of an individual. It scares me up to a certain point, because then teenagers grow up, understand certain things, and leave that world behind. But it scares me to think that kids can grow up with those role models (...) and the consequences that there might be (Maria)

5. General discussion

The study aimed to improve the understanding of young women's attitudes and perceptions towards VIs. In contrast to previous findings, our results showed a relatively low attractiveness of VIs compared to human influencers. As mentioned in the literature review, potential benefits of using VIs include higher engagement rates compared to human influencers (e.g., Sands et al., 2022) and their ability to elicit para-social responses from online audiences that do not appear significantly different from those of a flesh-and-blood influencer (Stein et al., 2022), providing support and increasing feelings of connectedness (Felnhofer et al., 2019). Our findings show that human influencers still outperform virtual ones for a number of reasons, the most important of which are as follows:

- *VIs appear as soulless entities, orchestrated by a hidden manipulator.*

Firstly, the impossibility of feeling a socio-emotional connection (which is what respondents are interested in when they choose to follow an influencer) and resonating with an entity that cannot experience real life. This hinders the establishment of a 'human' contact, an empathic relationship with creatures that seem soulless and, worse still, largely manipulated by those who—anonymously, behind their backs—are only interested in selling products. This association of VIs with manipulative fiction was widely shared by the participants. Although many of them also perceived something fictional in the behaviour of human influencers (and were aware of the existence of a team behind them), they were more forgiving of flesh-and-blood influencers, with whom many of them felt an affinity ('she lives my same problems'). The lower perception of 'manipulative' intent on the part of human influencers may be due to the consideration that the team working for the human influencer is acting in support of an individual who is directly putting her face and stakes her reputation on the content shared with her followers whereas the team that created (and manages) the VI is acting as a 'hidden' orchestrator, safely holding the strings of a digital puppet with a human appearance. In this perspective, even the social commitment proclaimed by the VI loses its meaning and is perceived as a ploy to gain consensus and followers, since the lack of 'real' life makes it impossible to verify the congruence between the values proclaimed and those lived.

- *Identification mechanisms get stuck and persuasiveness is lost*

The other-directed existence of the VI (and the uncertainty about who is behind this creature) hinders the development of the identification mechanisms and does not allow to verify whether the image of the influencer is in line with the individual ideal self, an aspect that, according to the logic of the self-celebrity congruence model (e.g., Choi and Rifon, 2012), is essential to obtain a favourable consumer attitude towards the product and to increase the purchase intention (Shan et al., 2020). In the absence of this congruence, evaluative outcomes regarding brands/products will not be influenced by the meanings and the associations that the influencer is intended to convey and the so-called parasocial identification, an imaginary relationship with the endorser (Choi and Rifon, 2007), cannot be formed as it happens with a human influencer who is perceived by some respondents as 'part of my group of friends'. However 'real' the influencer may seem ('she really seems to be a woman'), her inability to experience life makes her untrustworthy because she cannot 'demonstrate on her body' how the promoted product can solve a follower's problem (by showing the 'before' and 'after' in a credible way). Despite the higher engagement rates and the similar para-social responses found in previous studies on VIs (e.g., Stein et al., 2022; Sands et al., 2022), it seems that they are still not persuasive and not decisive in defining purchase decisions, which means that they have less impact than human influencers.

Regarding the issue of the physical appearance of the VIs, contrary to studies claiming that anthropomorphic embodiments of virtual agents elicit sympathetic social behaviour (e.g., Luger and Sellen, 2016; Tan and Liew, 2020), our results confirm that extreme resemblance of VIs to humans elicits negative emotional responses such as fear and disorientation (e.g., Wiese and Weiss, 2020; Arsenyan and Mirowska, 2021; Sands et al., 2022). When confronted with a VI that closely resembled a 'real woman', some respondents felt fearful of being subjected to a 'mental illusion' and stated that they found a blatantly artificial, cartoon-like character more reassuring.

Always related to the physical appearance of VIs, another aspect that has been discussed is the notion of beauty. While some previous studies involving experts have warned about the risk of presenting unrealistic beauty standards through VIs (Moustakas et al., 2020), to the best of our knowledge, the reaction of consumers to VIs depicting imperfections has not been considered so far. Our results show that, although young women agree in principle with the idea of showing influencers with imperfect appearances (going far from the unattainable beauty standards often created with Photoshop), the explicit declaration of imperfection made by the VI annoys them and raises suspicions of instrumentalisation, producing effects opposite to those probably expected by the creators.

5.1 Managerial implications

This study not only contributes to research by helping to understand the phenomenon of VIs from the perspective of potential followers, but also has some implications for companies interested in using VIs in their marketing activities. To increase the chances of success, it is not enough to give VIs a fully developed fictional life and a distinct personality. If consumers are not fully aware of the origin of the content created, they will not be truly influenced and will perceive the VI as a mere advertisement, providing an initial input that needs to be confirmed or incentivised (e.g., peer recommendations, discount codes, etc.) before leading to a purchase decision. Another aspect that companies should consider before choosing a VI as a partner relates to the success metrics. Engagement rate, as it is commonly measured (i.e., by the number of views, likes and comments), is an insignificant indicator of an influencer's true engagement capacity. Initial curiosity and a kind of fascination associated with the novelty effect can inflate the measure of the VIs' engagement rate without corresponding to a real interest on the part of the consumer to continue to stay in touch, interact, feel engaged and connected from a social-emotional point of view. Furthermore, when attempting to achieve a human-like appearance with the VIs they use, companies should be mindful of the uncanny valley effect to avoid unintentional eeriness and creepiness. Cartoon VIs may be a better alternative, but their suitability for a particular brand needs to be assessed.

5.2 Limitations and further research

This research has some limitations which are briefly mentioned below. First, the endorser-product congruence should be taken more into account, and this suggests the possibility of future studies focusing on product categories other than the two examined here (cosmetics and clothing), which are more dependent on a real human body (and on personal fit). There may be other types of products, e.g. technical ones, that are perceived as more congruent with a digitally generated creature whose endorsement may therefore be perceived as more credible in other contexts. Future studies on VIs are therefore challenged to vary not only the product category but also the platform under analysis (e.g., TikTok vs. Instagram); the gender and nationality of the participants (we only included young women from a single country) and the type of VI (e.g., 'incarnate' VIs, working for a single company vs. so-called 'innate' influencers who endorse various brands/product categories).

Finally, although two focus groups are not enough to generalise, the results of the current study are an important input to the construction of a quantitative survey to be conducted in the future to better understand the effectiveness of VIs and to get a sharper picture of how young (and not so young) people perceive them.

References

- Arsenyan, J. and Mirowska, A. (2021) "Almost human? A comparative case study on the social media presence of virtual influencers", *International Journal of Human-Computer Studies*, Vol. 155, 102694.
- Bazeley, P. (2013) *Qualitative data analysis: Practical strategies*, Sage, London.
- Boerman, S. C. (2020). "The effects of the standardized Instagram disclosure for micro and meso-influencers". *Computers in Human Behavior*, Vol 103, pp 199–207.
- Casaló, L.V., Flavián, C. and Ibáñez-Sánchez, S. (2020) "Influencers on Instagram: Antecedents and consequences of opinion leadership", *Journal of Business Research*, Vol. 117, pp 510-519.
- Catterall, M. and Maclaran, P. (2007) "Focus groups in marketing research". In R.W. Belk (Ed.), *Handbook of qualitative research methods in marketing* (pp 255-267), Edward Elgar, Cheltenham.
- Choi, S.M., and N.J. Rifon. (2012). "It is a match: The impact of congruence between celebrity image and consumer ideal self on endorsement effectiveness". *Psychology & Marketing* Vol. 29, No. 9, pp 639–50.
- Conti, M., Gathani, J. and Tricomi, P.P. (2022) "Virtual Influencers in Online Social Media", *IEEE Communications Magazine*, Vol. 60, No. 8, pp 86-91.
- de Brito Silva, M. J., de Oliveira Ramos Delfino, L., Alves Cerqueira, K. and de Oliveira Campos, P. (2022) "Avatar marketing: A study on the engagement and authenticity of virtual influencers on Instagram", *Social Network Analysis and Mining*, Vol. 12, No. 1, pp 1-19.
- De Veirman, M., Cauberghe, V. and Hudders, L. (2017) "Marketing through Instagram influencers: The impact of number of followers and product divergence on brand attitude", *International Journal of Advertising*, Vol. 36, No. 5, pp 798–828.
- Djafarova, E. and Rushworth, C. (2017) "Exploring the credibility of online celebrities' Instagram profiles in influencing the purchase decisions of young female users", *Computers in Human Behavior*, Vol. 68, pp 1-7.
- Edwards, C., Edwards, A., Stoll, B., Lin, X. and Massey, N. (2019). "Evaluations of an artificial intelligence instructor's voice: Social identity theory in human-robot interactions". *Computers in Human Behavior*, Vol. 90, pp 357-362.
- Feine, J., Gnewuch, U., Morana, S. and Maedche, A. (2019). "A taxonomy of social cues for conversational agents". *International Journal of Human-Computer Studies*, Vol. 132, pp 138-161.

- Guthrie, S. (2020) "Virtual influencers: More human than human". In S. Yesiloglu and J. Costello (Eds.) *Influencer Marketing: Building Brand Communities and Engagement*, Routledge, New York.
- Haenlein, M., Anadol, E., Farnsworth, T., Hugo, H., Hunichen, J. and Welte, D. (2020) "Navigating the New Era of Influencer Marketing: How to be Successful on Instagram, TikTok, & Co.", *California Management Review*, Vol. 63, No. 1, pp 5-25.
- Kim, D.Y. and Kim, H.Y. (2021) "Trust me, trust me not: A nuanced view of influencer marketing on social media", *Journal of Business Research*, Vol. 134, pp 223-232.
- Miao, F., Kozlenkova, I.V., Wang, H., Xie, T. and Palmatier, R.W. (2022) "An emerging theory of avatar marketing", *Journal of Marketing*, Vol. 86, No. 1, pp 67-90.
- Morgan, D.L. (1996) *Focus groups as qualitative research* (Vol. 16), Sage, Thousand Oaks.
- Mori, M. (1970) "Bukimi no tani" [The Uncanny Valley], *Energy*, Vol. 7, pp 33-35.
- Moustakas, E., Lamba, N., Mahmoud, D. and Ranganathan, C. (2020) "Blurring lines between fiction and reality: Perspectives of experts on marketing effectiveness of virtual influencers". In *Proceedings of the 2020 International Conference on Cyber Security and Protection of Digital Services*.
- Naumann, S. and Daubenbüchel, C. (2021). Virtual influencers - The next hype in influencer marketing? Available at <https://www.ond.com/news/virtual-influencers-the-next-hype-in-influencer-marketing/>
- Richards, L. and Morse, J. M. (2012) *Readme first for a user's guide to qualitative methods*, Sage, Thousand Oaks.
- Sands, S., Campbell, C.L., Plangger, K. and Ferraro, C. (2022) "Unreal influence: leveraging AI in influencer marketing", *European Journal of Marketing*, Vol. 56, No. 6, pp 1721-1747.
- Schouten, A. P., Janssen, L. and Verspaget, M. (2020) "Celebrity vs. Influencer endorsements in advertising: the role of identification, credibility, and Product-Endorser fit", *International Journal of Advertising*, Vol. 39, No. 2, pp 258-281.
- Sokolova, K., and Kefi, H. (2019) "Instagram and YouTube bloggers promote it, why should I buy? How credibility and parasocial interaction influence purchase intentions", *Journal of Retailing and Consumer Services*, Vol 53, 101742.
- Statista (2021) Influencer marketing worldwide - statistics & facts, available at https://www.statista.com/topics/2496/influence-marketing/#topicHeader_wrapper
- Stein, J. P., Linda Breves, P. and Anders, N. (2022) "Parasocial interactions with real and virtual influencers: The role of perceived similarity and human-likeness", *New Media & Society*, published online June 13, 2022.
- Stewart, D.W. and Shamdasani, P. (2017) "Online focus groups", *Journal of Advertising*, Vol. 46, No. 1, pp 48-60.
- Tan, S.M., and Liew, T.W., (2020). "Designing embodied virtual agents as product specialists in a multi-product category e-commerce: the roles of source credibility and social presence. *International Journal of Human-Computer Interaction*. Vol. 36, pp. 1136-1149.
- Wiese, E. and Weis, P. P. (2020) "It matters to me if you are human-Examining categorical perception in human and nonhuman agents" *International Journal of Human-Computer Studies*, Vol. 133, pp 1-12.

Appendix

Profiles of the participants in the focus groups

Name	Age (years)	Education	Occupation
Grazia	41	Bachelor degree	Employee
Natalia	24	Bachelor degree	Student
Maria	25	Master degree	Employee
Angela	34	Master degree	Employee
Antonella	26	Master degree	Unemployed
Carla	25	Bachelor degree	Student
Milena	35	High school diploma	Unemployed
Rossana	22	High school diploma	Student
Alexandra	25	Bachelor degree	Student
Serena	28	Master degree	Employee
Maria Antonietta	24	High school diploma	Student
Erika	22	High school diploma	Student
Valery	25	Master degree	Student
Martina	18	Middle school license	Student
Sara	18	Middle school license	Student
Francesca	23	Bachelor degree	Student

Literary Communities in Social Media: The Influence of Motivations on Engagement and Purchase Intention in Women

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Abstract: A decreasing trend in young people's recreational reading habits has been observed worldwide. On the other hand, young people's daily use of social media has increased dramatically in recent years. With this evolution, different literary communities and influencers also emerged on social media. It is necessary to understand the motivations that lead users to engage in social media to maintain an active and involved community. Researchers have already discussed a core set of motivations to participate in online communities. However, most studies focus on brand communities, and few analyze literary communities' specific cases. There are various motivations for participating in communities. However, we highlight the social motivations (meeting people, being part of the community, sharing information, listening to other opinions) and hedonic ones (because participating in them is a pleasant, fun, enjoyable activity). Engagement in social media can be measured through a passive attitude of lurkers who only see published content or an active attitude when users comment and publish content on social media, generating discussion and interaction in the community. On the other hand, some studies in other areas show that intention and propensity to purchase can be affected by many factors, such as social and hedonic motivations. Could also these motivations influence intention to purchase books? This study aims to study the influence of hedonic and social motivations to participate in literary communities on social media engagement and book purchase intention. A quantitative methodology was used, with a sample of N= 272 female participants in literary communities on social media. The data was analyzed through the modeling of structural equations by the AMOS software. Results show that social motivations are positively related to the level of engagement in literary communities on social media. Additionally, this study revealed that hedonic motivations influence book purchase intention.

Keywords: Literary Communities, Hedonic Motivations, Social Motivations, Social Media Engagement, Book Purchase Intention

1. Introduction

Currently, it is possible to observe a decrease in the recreational reading habits of young people around the world (National Endowment for the Arts, 2007; Twenge, Martin, & Spitzberg, 2018; Loh & Sun, 2022).

The motivation behind this decline is often attributed to technology, the Internet, and the emergence of social media (Brike, 2021; Merga, 2021; Loh & Sun, 2022; Murray, 2022). Despite this, and although using social media is a leisure activity favored by young people (Perrin, 2015; Prinstein, Nesi, & Telzer, 2020), different scholars affirm that the use of social media can not only coexist with recreational reading, but it can also be used as a way of inspiring young people to read more in their free time (Brike, 2021; Jerasa & Boffone, 2021; Thomas, 2021; Wiederhold, 2022).

The emergence and popularity of literary communities and literary/book influencers across different social media are proof that this is possible (Guiñez-Cabrera & Mansilla-Obando, 2022), and it is imperative to study if the engagement existing in these literary communities positively impacts the reading habits and the purchase intentions of books of those who participate in them.

This study aims to take a deeper look into the main literary communities – *BookTok*, *Bookstagram*, and *BookTube* – and study the influence of social and hedonic motivations to participate in them on engagement and book purchase intention.

2. Literature Review

2.1 Virtual literary communities

Although looked over many times, the feeling of being a part of a community has been an important motivational factor for readers for a long time (Thomas, 2021; Reddan, 2022). From book clubs to T.V. and radio segments

and shows dedicated to literature (Reddan, 2022), the act of reading and exchanging opinions as a group has kept those involved more engaged and motivated to read while strengthening the relationship between participants (Petrich, 2013; Augusto et al., 2019; Augusto et al., 2020). These groups are integrated by a variety of people who share an interest for literature and for the act of reading, but are especially popular among the female population (Craig, 2019; Sedo, 2003).

With the current advances in technology and the emergence of the internet, these literary communities have found a place for themselves online, and it is possible to find traces of them in blogs, websites, podcasts, and social media (Thomas, 2021). Complete with *bookfluencers* (the influencers of these literary communities) and legions of fans (Reddan, 2022), these literary communities are generally characterized by their predominantly young participants and preference for Young Adult literature (Wiederhold, 2022) and have significantly impacted the reading habits of young people (Lo, 2020; Jerasa & Boffone, 2021; Wiederhold, 2022) and the global publishing industry (Dezuanni et al., 2022), from the design of book covers (Reddan, 2022) to the titles that figure in bestselling lists across the world (Wiederhold, 2022).

There are many literary communities online, each with its specific way of functioning. However, it is possible to point to BookTube, Bookstagram, and BookTok – the literary communities of YouTube, Instagram, and TikTok, respectively – as the main ones regarding social media (Murray, 2022; Reddan, 2022).

2.2 Social and hedonic motivations to participate in literary communities

2.2.1 Social motivations

Literary communities, whether virtual or not, are inherently social (Thomas, 2021), and this social aspect plays the most significant role in motivating young people to join these communities. According to Paladines and Aliagas (2022), virtual literary communities are popular among young readers since this demographic could not find "a social space where relationships centered around literature might develop" offline, which has led them to search for such a space online.

Above all, the members of the literary communities of social media seek people with shared interests and preferences in books (Guiñez-Cabrera & Mansilla-Obando, 2022) and a place where they can not only "share their own reading experience with other readers" (Paladines & Aliagas, 2022), but build meaningful relationships and form friendships with others (Guiñez-Cabrera & Mansilla-Obando, 2022).

It is also argued that these virtual literary communities can become an integral part of these young people's identity and sense of self (Jerasa & Boffone, 2021; Wiederhold, 2022). In fact, and although this may be applied to offline literary communities as well, Wiederhold (2022) defends that *BookTok* in particular "makes space for identities that are underrepresented in the traditional canon and allows for a community with books not considered 'appropriate' for academic spaces."

Considering this, it is crucial to highlight the aspect of relatability that is present in the literary communities studied.

Young people are at the heart of these literary communities (Wiederhold, 2022), and it is vital to them that, in order to participate and engage, content creators are viewed as relatable (Paladines-Paredes & Margallo, 2020). This element of relatability is crucial, as, on top of being of great help when it comes to forming relationships between members, the young reader demographic of these literary communities tends to listen to the recommendations of people they relate to in terms of age, personality, and preference in books (Guiñez-Cabrera and Mansilla-Obando, 2022; Paladines and Aliagas, 2022).

2.2.2 Hedonic motivations

Guiñez-Cabrera and Mansilla-Obando (2022) argue that the literary communities of social media are considered an "entertaining past time" by its members, as they have fun and find enjoyment in both posting and participating in trends and feel like they can be creative all while nurturing their love for literature (Tolstopyat, 2018; Guiñez-Cabrera & Mansilla-Obando, 2022).

In addition to portraying these literary communities as fun and entertaining, it is essential to mention the adoration of books as physical objects by their members (Tolstopyat, 2018). From posts that showcase bookshelves and book collections to aesthetically pleasing and intricate pictures taken of books and book hauls

(Dezuanni et al., 2022), there is an appreciation of books as art pieces and a clear preference for books that are considered aesthetically pleasing, especially when it comes to *Bookstagram* (Reddan, 2022).

2.3 Social Media Engagement

Social media have changed the way in which consumers interact and relate to brands and to each other. It deepened consumer–brand interactions (Vohra & Bhardwaj, 2019), becoming a crucial tool in buyer-seller communication (Wang, Pauleen, & Zhang, 2016). This dialogue is not just between brand-consumers but in consumer-consumer interactions (Hook, Baxter, & Kulczynski, 2018). Consequently, these tools have also influenced consumers' purchasing decisions (Guercini et al., 2018; Augusto et al., 2019; Santos & Santo, 2019; Ferreira et al., 2021; Espírito Santo et al., 2023).

Social media have created lasting relationships, generated connections, and engaged customers (Westberg, Stavros, Smith, Munro, & Argus, 2018). In these, social media engagement is the main force.

Some authors (Brodie et al., 2013) emphasize customer engagement as a crucial element in maintaining brand communities, which is fundamental for brands. In this way, it has received increasing attention from researchers as it influences consumer behavior (Schivinski, 2019).

This engagement is divided into several levels according to the consumers' online brand-related activities (COBRAs) framework of Muntinga, Moorman, and Smit (2011). Engagement can be passive, such as the consumption of information (seeing posts, images, videos, etc.), or active, such as creating content by consumers (user-generated content through posts, videos, or images).

Several authors (Malthouse, Calder, Kim, & Vandenbosch, 2016; Wijeyaratne, Resnick, & Poorrezaei, 2019) show that engagement in social media positively influences brand loyalty, brand equity, purchase intentions, and advertising effectiveness, among others. However, studies need to show the impact of social media engagement on non-commercial communities (not powered by brands), such as literary communities, which we will analyze in this study.

2.4 Purchase Intention

Several authors have analyzed purchase intention, framed in loyalty, over the years. Aaker (1991, p. 39) defines "brand loyalty as the attachment that a customer has to a brand". Loyalty can have different levels in which purchase intention and the number of repeated purchases stand out (Keller 1998). Purchase intention is the willingness to buy an article (Raza et al., 2014; Santo & Trigo, 2020; Santo & Marques, 2022).

Before buying, consumers research, analyze the product, and then intend to buy it (Lim et al., 2016). This intention corresponds to the interests of consumers and the possibility of buying the product/service (Kim & Ko, 2012).

Interactions between consumers in communities foster this intention. Adjei et al. (2010) show that virtual communities positively impact sales and purchase intentions since the information from other members is more helpful than the brands' (Kozinets, 2002).

Although several studies analyze virtual communities, they are focused on brand-related factors (Han & Zhou, 2020) and not communities for non-commercial purposes, such as literary communities.

In these communities, trust in other users' content will be greater, as users perceive no commercial interest (Mir & Rehman, 2013).

Thus, several studies (Aaker, 1991; Shivinski & Dabrowski, 2016; Khadim, Zafar, Younis, and Nadeem, 2014) show that social media positively influences consumer purchase intentions. Thus, consumers trust more what others say on social media than brand information (Thoumrungroje, 2014) to help them make a purchase decision (Bae & Lee, 2011).

In a study by Balakrishnan, Dahnail, and Yi (2014) on generation Y, the results show that eWOM in online communities promotes brand loyalty and product purchase intention through company websites and social media platforms.

Therefore, participating in virtual communities has advantages for its members, which, in addition to interaction, affects members' purchase decisions (Ho, 2014).

After the literature review, we postulate the following hypotheses:

H1: Social motivations have positive impacts on virtual literary communities' engagement

H2: Social motivations have positive impacts on book purchase intention

H3: Hedonic motivations have positive impacts on virtual literary communities' engagement

H4: Hedonic motivations have positive impacts on book purchase intention

H5: Literary communities' engagement has positive impacts on book purchase intention

3. Methodology

To complete the research purposes and evaluate the suggested model, we performed a study in the context of social media. Data was collected through online self-completion, and respondents were contacted through social media. In order to gather responses to our survey, an account named 'Social Books' was created on *Instagram* and direct contact was established with the literary community of said social media platform. This was accomplished by publishing different posts integrating *hashtags* widely used by the literary community of *Instagram*, establishing contact with different *bookfluencers*, and by engaging with the publications of different members of the community.

The concepts were operationalized using scales already tested in the literature and adapted to the context of our study. Thus, this investigation uses three items from Bang et al. (2018) for social motivations (MSOC). Hedonic motivations (MHED) were measured using three items adapted from Baabdullah (2018) and two items for the engagement Schivinski et al. (2016). We also follow the two items from Limei and Wei (2020) to measure the intention to buy books. All items were measured using a 5-point Likert scale, ranging from strongly disagree (1) to strongly agree (5).

Data was collected through a self-administered survey conducted between September and October 2022. We collected 272 valid responses, and Table 1 shows the sample characteristics. The focus of this study is the women that participate in social media literary communities. Although it wasn't our intention to study a female-only sample and no gender restrictions were applied during the development of this study, 100% of our 272 valid responses were given by women. This can be explained by the predominance of women in these literary communities, who participate in greater numbers than men. It is also relevant to say that 54.4% of the participants in this study were under 30 years old and, in many cases, had a university degree.

Table 1. Sample

Variable	Category	N (%)
Gender	Female	272 (100%)
Age	< 20 years old	52 (19.1%)
	20-29 years	145 (53.3%)
	30-39 years	55 (20.2%)
	40-49 years	16 (5.9%)
	50 years old or higher	4 (1.5%)
Education	Basic school	11 (4.0%)
	Secondary school	104 (38.2%)
	University degree	157 (57.8%)

4. Results

The sample size permits using multivariate analysis techniques such as structural equation modeling (SEM) considering the 5:1 (responses: items) rule. This technique (SEM) has extensive use in analyzing the proposed relationships. Therefore, to test the hypothesis, the AMOS software was used.

The SEM multivariate analysis techniques have two phases. First, the analysis of the reliability and validity measurement model, and second, the analysis of the hypotheses through the significance of the relationships between the variables.

Consequently, a preliminary data analysis was realized, and we ran a series of regression models on the various constructs to calculate the VIF (Variance Inflation Factor) value. Thus, we found that the VIF value is below the threshold recommended by the literature ($VIF < 5$). So, we considered that multicollinearity is not considered problematic.

Following the analysis of asymmetry (Sk - Skewness) and flatness (Ku - Kurtosis), we concluded that the items do not diverge from normality ($Sk < 3$; $Ku < 7$). Additionally, the Kaiser-Meyer-Olkin (KMO) value was obtained, as well as Bartlett's test of sphericity, to measure sampling adequacy. The KMO is 0.828 (> 0.7) and the sphericity is significant at $p < 0.05$. Therefore, the data are adjusted for factor analysis.

In addition, the common method bias was analyzed because our data were collected from the same source (Podsakoff et al., 2003). To analyze this potential bias, we used ex-ante and ex-post methods. The ex-ante methods were followed by suggestions from the literature. We pre-tested the questionnaire with 14 social network users to avoid ambiguous items and questions with complex syntax. In addition, on the first page of the survey, we informed respondents about the anonymity of their answers and that there would be no right or wrong answers for each item. From the procedures, ex-post, we ran Harman's one-factor test, and the result shows four factors, and the first factor explains 28.61% of the variance.

4.1 Measurement Model

As the study variables were measured using existing scales, a confirmatory factor analysis with maximum likelihood estimation was performed to verify reliability and validity. The results of the model fit indices were acceptable ($\chi^2 = 86.937$; $df = 29$; $\chi^2 / df = 2.998$; $GFI = 0.946$; $CFI = 0.971$; $NFI = 0.957$; $IFI = 0.971$; $TLI = 0.954$; $RMSEA = 0.084$) (Anderson & Gerbing, 1988; Hair et al., 2018).

Convergent validity and reliability were analyzed through the Average Variance Extracted (AVE) and Composite Reliability (C.R.). Thus, Table 2 shows that AVE (ranging from 0.660 to 0.842) and C.R. (ranging from 0.789 to 0.941) is above the threshold values ($AVE > 0.5$; $C.R. > 0.7$). In addition, we examined the standardized loadings (λ), which are above the recommended value (Chin, 1998).

Table 2 – Measurement model

Latent variable	Items Code	λ	t-values	R^2	CR	AVE
MSOC	MSOC1	0.854	(a)	0.729	0.888	0.726
	MSOC2	0.915	19.513	0.838		
	MSOC3	0.782	15.312	0.612		
MHED	MHED1	0.856	(a)	0.732	0.941	0.842
	MHED2	0.947	22.842	0.897		
	MHED3	0.947	23.224	0.897		
ENG	ENG1	0.848	(a)	0.719	0.826	0.704
	ENG2	0.83	11.114	0.688		
INT	INT1	0.638	(a)	0.407	0.789	0.660
	INT2	0.956	3.037	0.871		

Following, we present in table 3 the Fornell and Larcker criterion to examine discriminant validity. We observed that all AVE values (on the diagonal of table 3) are higher than the squared inter-construct correlation estimates.

Table 3 – Discriminant Validity

	MSOC	MHED	ENG	INT
MSOC	0.726			
MHED	0.501	0.842		
ENG	0.404	0.265	0.704	
INT	0.016	0.069	0.006	0.698

4.2 Structural Model

After the measurement analysis, we tested the hypotheses. Table 4 reveals that the structural model validated 2 of the five hypotheses. Furthermore, we found that the conceptual model showed an adequate fit ($\chi^2=86.937$; $df=29$; $\chi^2/df=2.998$; $GFI=0.946$; $CFI=0.971$; $NFI=0.957$; $IFI=0.971$; $TLI=0.954$; $RMSEA=0.084$) (Anderson & Gerbing, 1988).

Table 4 – Measurement model

Hypotheses	Path	β	t-values	p-values	Result
H1	MSOC→ENG	0,542	5,902	p<0.01	Corroborated
H2	MSOC→INT	-0,071	-0,658	0,511	Not corroborated
H3	MHED→ENG	0,132	1,515	0,13	Not corroborated
H4	MHED→INT	0,323	2,3	0,021	Corroborated
H5	ENG→INT	-0,083	-0,953	0,34	Not corroborated

5. Discussion and Conclusions

With the rapid changes in technology and the growth of the internet, many young readers found themselves in virtual literary communities. These communities, present in different social media platforms, allow their members to find a social space where they can share their passion for books and reading with like-minded people (Guiñez-Cabrera & Mansilla-Obando, 2022; Paladines & Aliagas, 2022).

Social media generates content that users consider valuable; increasingly, the information disseminated on social media is used for purchasing decisions (Aaker, 1991; Shivinski & Dabrowski, 2016; Khadim, Zafar, Younis, and Nadeem, 2014). Having this in mind, our study sought to analyze the impact of hedonic and social motivations on engagement in literary communities and on the intention to buy books.

The popularity of virtual literary communities was the reason behind this study and, in order to conduct it, an online self-completion survey for the members of the virtual literary community of Instagram was developed. Although there were no restrictions to the participants other than being a part of a social media literary community, 100% of the participants of the study consisted of women and 72,4% consisted of people under 30 years of age. This corroborates with the affirmations made by Craig (2019) and Sedo (2003), who claim that the greatest chunk of participants in literary communities are women, and with the affirmations made by Wiederhold (2022), who claims that online literary communities in particular are vastly made up by young people.

Engagement in social media is higher in young consumers and, by the results of this study, we corroborate that engagement in virtual literary communities is greater influenced by social motivations rather than hedonic ones. In this sense, the interactions between consumers in virtual literary communities are justified, above all, by the social need of readers of finding a community where they can form relationships with people they relate to and share interests with. This finding agrees with the works of Paladines and Aliagas (2022) and Guiñez-Cabrera and Mansilla-Obando (2022).

However, if engagement is generated mainly by social motivations, purchase intention is generated by the hedonic motivations of each individual. It is perceived that reading is still a pleasure that individuals have.

Finally, this study did not prove that there is a correlation between engagement and purchase intention in virtual literary communities. These finding may be due to the fact these communities are mainly made up of a younger audience, who typically possess a smaller purchasing power.

We consider our sample, which is composed mainly of young, college-educated women, a limitation of our work. Further studies should be conducted to analyze samples with more differentiated audiences. We also consider that virtual communities are distinct and vary according to the social media platform they exist in (Murray, 2022; Reddan, 2022). Having this in mind, analyzing and comparing members in different virtual literary communities – such as BookTok or BookTube instead of just Bookstagram – may have interesting results.

Acknowledgment

This work is funded by National Funds through the FCT – Foundation for Science and Technology, I.P., within the scope of the project Ref. UIDB/05583/2020. Furthermore, we would like to thank the Research Centre in Digital Services (CISeD) and the Instituto Politécnico de Viseu for their support.

References

- Aaker, D (1991). *Managing Brand Equity: Capitalizing on the Value of a Brand Name*, New York, Free Press
- Adjei, M.T., Noble, S.M, Noble, C.H.C.H. (2010). The influence of C2C communications in online brand communities on customer purchase behavior. *Journal of Academy of Marketing Science*, Vol 38, pp. 634–653. doi:10.1007/s11747-009-0178-5
- Anderson, J. C. & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, Vol. 103, No.3, pp. 411-423. <https://doi.org/10.1037/0033-2909.103.3.411>
- Augusto, L., Santos, S. & Santo, P. E. (2019). Engagement in social media: A multigroup analysis between individuals from Portugal and Poland. *RISTI - Revista Iberica de Sistemas e Tecnologias de Informacao*, 2019(E24), pp. 112-124. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85077546612&partnerID=40&md5=687fa284011bf65911e46014d2563e15>
- Augusto, L., Santos, S. & Santo, P. M. D. E. (2020). Usability and sophistication of websites: A path to satisfaction in online retail. *RISTI - Revista Iberica de Sistemas e Tecnologias de Informacao*, 2020(E34), 542-556. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85092249923&partnerID=40&md5=95dada791e15d752621934db89ae5484>
- Baabdullah, A. M. (2018). Consumer adoption of Mobile Social Network Games (M-SNGs) in Saudi Arabia: The role of social influence, hedonic motivation, and trust. *Technology in Society*, Vol. 53, pp. 91-102. <https://doi.org/https://doi.org/10.1016/j.techsoc.2018.01.004>
- Bae, S., & Lee, T. (2011). Product Type and Consumers' Perception of Online Consumer Reviews. *Electronic Markets*, Vol 21, No.4, pp. 255–266.
- Balakrishnan, B. K.P.D.; Dahnil, I.M. ; Yi, W. J. (2014). The Impact of Social Media Marketing Medium toward Purchase Intention and Brand Loyalty among Generation Y, *Procedia - Social and Behavioral Sciences*, Vol 148, pp. 177-185
- Bang, J., Youn, S., Rowan, J., Jennings, M. & Austin, M. (2018). Motivations for and outcomes of participating in research online communities. *International Journal of Market Research*, Vol. 60, No. 3, pp. 238-256. <https://doi.org/10.1177/1470785317744110>
- Brike, D. (2021) 'Social Reading? On the Rise of a "Bookish" Reading Culture Online', *Poetics Today*, Vol. 42, No.2, pp. 149–172. DOI:<https://doi.org/10.1215/03335372-8883178>.
- Brodie, R. J., Ilic, A., Juric, B., & Hollebeek, L. (2013). Consumer engagement in a virtual brand community: An exploratory analysis. *Journal of Business Research*, Vol 66, No1, pp. 105–114.
- Chin, W. W. (1998). The partial least squares approach for structural equation modeling. In *Modern methods for business research*. (pp. 295-336). Lawrence Erlbaum Associates Publishers.
- Craig, C. (2019). Reading identity: American and Irish Women's book clubs, culture, and identity. *Irish Journal of Sociology*, 27(2), 128–152. <https://doi.org/10.1177/0791603519828664>
- Dezuanni, M. et al. (2022) 'Selfies and shelfies on #bookstagram and #booktok—social media and the mediation of Australian teen reading,' *Learning, Media and Technology*, 47(3), pp. 355–372. doi:10.1080/17439884.2022.2068575.
- Espírito Santo, P., da Cruz, S. M., Fortes, N. & Cardoso, P. A. (2023). Antecedents of Engagement on Social Media: Fatigue and Anxiety. In *Springer Series in Design and Innovation* (Vol. 27, pp. 115-124). https://doi.org/10.1007/978-3-031-20364-0_11
- Gómez, M., Lopez, C., & Molina, A. (2019). An integrated model of social media brand engagement. *Computers in Human Behavior*, Vol 96, pp 196–206.
- Guercini, S., Mir, P., & Prentice, C. (2018). New marketing in fashion ecommerce. *Journal of Global Fashion Marketing*, Vol 9, No1, pp. 1–8. <https://doi.org/10.1080/20932685.2018.1407018>
- Guiñez-Cabrera, N. and Mansilla-Obando, K. (2022) 'Booktokers: Generar y compartir contenidos sobre libros a través de TikTok', *Comunicar: Revista Científica de Comunicación y Educación*, Vol. 30, No. 71, pp. 119–130.
- Hair, J. F., Black, W. C., Babin, B. J. & Anderson, R. E. (2018). *Multivariate Data Analysis*. Pearson Education Limited. <https://books.google.pt/books?id=VvXZnQEACAAJ>
- Han, X., and Zhou, J. R. (2020). Impact of UGC information type and poster's avatar on other users' willingness to purchase: based on the study of socialized e-commerce little red book. *Shanghai Management Science*, Vol 42, pp. 31–37. doi: 10.3969/j.issn.1005-9679.2020.02.006
- Ho, C.W. (2014). Consumer behavior on Facebook. *EuroMed Journal of Bussiness*, Vol 9, pp. 252–267. doi:10.1108/EMJB-12-2013-0057
- Hook, M., Baxter, S., & Kulczynski, A. (2018). Antecedents and consequences of participation in brand communities: A literature review. *Journal of Brand Management*, Vol 25, pp. 277–292.
- Jerasa, S. and Boffone, T. (2021) 'BookTok 101: TikTok, Digital Literacies, and Out-of-School Reading Practices', *Journal of Adolescent and Adult Literacy*, 65(3), pp. 219–226. doi:10.1002/jaal.1199.

- Jerasa, S. and Boffone, T. (2021) 'BookTok 101: TikTok, Digital Literacies, and Out-of-School Reading Practices', *Journal of Adolescent and Adult Literacy*, 65(3), pp. 219–226. doi:10.1002/jaal.1199.
- Keller, K.L. (1998) *Strategic Brand Management: Building, Measuring and Managing Brand Equity*. Prentice Hall
- Khadim, R. A., Zafar, B., Younis, M., and Nadeem M, A. (2014). Social Media Communication and Consumer Brand Perceptions. *International Journal of Social Sciences and Management Studies*, Vol. 1, No. 1, pp. 12-20
- Kim, A.J. ; Ko, E. (2012). Do social media marketing activities enhance customer equity? An empirical study of luxury fashion brand, *Journal of Business Research*, Vol 65, No. 10, pp. 1480-1486,
- Kozinets, R. V. (2002). The field behind the screen: using net-nography for marketing research in online communities. *Journal of Marketing Research*, Vol 39, pp 61–72. doi: 10.1509/jmkr.39.1.61.18935
- Lim, Y.J; Osman, A.; Salahuddin, N.S; Romle, A.R.; Abdullah, S. (2016). Factors Influencing Online Shopping Behavior: The Mediating Role of Purchase Intention, *Procedia Economics, and Finance*, vol 35, pp. 401-410
- Limei, C. & Wei, L. (2020). The Impact of Reviewers' Creditworthiness on Consumers' Purchase Intention in Edge Path: Implications for the Coronavirus Disease 2019 Pandemic. *Public Health*, 8(619263), 1-8. <https://doi.org/https://doi.org/10.3389/fpubh.2020.619263>
- Lo, E.Y. (2020) 'How social media, movies, and T.V. shows interacts with Young Adult literature from 2015 to 2019', *Publishing Research Quarterly*, 36(4), pp. 611–618. doi:10.1007/s12109-020-09756-8.
- Loh, C.E., and Sun, B. (2022) 'The impact of technology use on adolescents' leisure reading preferences,' *Literacy*, pp. 1–13. doi:10.1111/lit.12282.
- Malthouse, E. C., Calder, B. J., Kim, S. J., & Vandenbosch, M. (2016). Evidence that user-generated content that produces engagement increases purchase behaviors. *Journal of Marketing Management*, Vol 32, No. 5–6, pp.427–444.
- Merga, M.K. (2021) 'How can Booktok on TikTok inform readers' advisory services for young people?', *Library and Information Science Research*, Vol. 43, No 2, p. 101091. doi:10.1016/j.lisr.2021.101091.
- Mir, I. A., & Rehman, K. U. (2013). Factors Affecting Consumer Attitudes and Intentions toward User-Generated Product Content on YouTube. *Management & Marketing Challenges for the Knowledge Society*, Vol 8, No. 4, pp. 637–654.
- Muntinga, D.G., Moorman, M., Smit, E.G., (2011). Introducing COBRAs: exploring motivations for brand-related social media use. *International Journal of Advertising*, Vol 30, No 1, pp. 13–46.
- Murray, S. (2022) 'Varieties of digital literary studies: Micro, macro, meso,' *Digital Humanities*, 16(2). Available at: <http://www.digitalhumanities.org/dhq/vol/16/2/000616/000616.html>.
- Paladines, L. and Aliagas, C. (2022) 'Literacy and literary learning on BookTube through the lenses of Latina BookTubers', *Literacy [Preprint]*. Doi:<https://doi.org/10.1111/lit.12310>.
- Paladines-Paredes, L.-V., and Margallo, A.-M. (2020) 'The booktuber channels as a space of socialization of youth reading practices,' *Ocnos: Revista de Estudios sobre Lectura*, 19(1), pp. 55–67. DOI:https://doi.org/10.18239/ocnos_2020.19.1.1975.
- Perrin, A. (2015) *Social Media Usage: 2005-2015*, Pew Research Center. Available at: <https://www.pewresearch.org/internet/2015/10/08/social-networking-usage-2005-2015/>.
- Petrich, N.R. (2013) 'Book Clubs: Conversations Inspiring Community,' *Inquiry in Education*, 7(1). Available at: <https://files.eric.ed.gov/fulltext/EJ1171691.pdf>.
- Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y. & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, Vol. 88, No. 5, pp. 879-903. <https://doi.org/10.1037/0021-9010.88.5.879>
- Prinstein, M.J., Nesi, J. and Telzer, E.H. (2020) 'Commentary: An updated agenda for the study of digital media use and adolescent development – future directions following Odgers & Jensen', *The Journal of Child Psychology and Psychiatry*, Vol. 61, No. 3, pp. 349–352. doi:10.1111/jcpp.13219.
- Raza, M. A., Ahad, M. A., Shafqat, M. A., Aurangzaib, M., & Rizwan, M. (2014). The Determinants of Purchase Intention towards Counterfeit Mobile Phones in Pakistan. *Journal of Public Administration and Governance*, Vol 4, No. 3, pp. 1–19.
- Reddan, B. (2022) 'Social reading cultures on BookTube, Bookstagram, and BookTok', *Synergy*, 20(1). Available at: <http://www.slav.vic.edu.au/index.php/Synergy/article/view/597>.
- Rousseau, D.M.; Sitkin, S.B. ; Burt; R.S. and Camerer, C. (1998). Not so different after all: A cross-discipline view of trust, *Academy of Management Review*, Vol. 23 No. 3, 393-404.
- Santo, P. E. & Marques, A. M. A. (2022). Determinants of the online purchase intention: hedonic motivations, prices, information and trust. *Baltic Journal of Management*, Vol. 17, No.1, pp. 56-71. <https://doi.org/10.1108/BJM-04-2021-0140>
- Santos, S. & Santo, P. E. (2019). The effects of collectivism and social network self-congruity on engagement. Multi Conference on Computer Science and Information Systems, MCCSIS 2019 - Proceedings of the International Conferences on ICT, Society and Human Beings 2019, Connected Smart Cities 2019 and Web Based Communities and Social Media 2019,
- Schivinski, B. & Dabrowski, D. (2016) The effect of social media communication on consumer perceptions of brands, *Journal of Marketing Communications*, Vol 22, No. 2, pp. 189-214, DOI: [10.1080/13527266.2013.871323](https://doi.org/10.1080/13527266.2013.871323)
- Schivinski, B., Christodoulides, G. & Dabrowski, D. (2016). Measuring Consumers' Engagement With Brand-Related Social-Media Content. *Journal of Advertising Research*, 56(1), 64. <https://doi.org/10.2501/JAR-2016-004>

- Schivinski, B., Muntinga, D. G., Pontes, H. M., & Lukasik, P. (2019). Influencing cobras: The effects of brand equity on the consumer's propensity to engage with brand-related content on social media. *Journal of Strategic Marketing*, Vol 29, No 1, pp. 1–23.
- DeNel Rehberg Sedo, D. R. (2003). Readers in Reading Groups. *Convergence*, Vol 9, No 1, pp. 66-90.
- Thomas, B. (2021) 'The #bookstagram: Distributed reading in the social media age, *Language Sciences*, 84. doi:10.1016/j.langsci.2021.101358.
- Thoumrungroje, A. (2014). The Influence of Social Media Intensity and EWOM on Conspicuous Consumption. *Social and Behavioral Sciences*, (November 2012), pp. 7–15.
- Tolstopyat, N. (2018) 'BookTube, Book Clubs and the Brave New World of Publishing,' *Satura*, 1, pp. 91–96. DOI:https://doi.org/10.17879/satura-2018-3140.
- Twenge, J.M., Martin, G.N. and Spitzberg, B.H. (2018) 'Trends in U.S. Adolescents' Media Use, 1976-2016: The Rise of Digital Media, the Decline of T.V., and the (Near) Demise of Print', *Psychology of Popular Media Culture*, 8(4), pp. 329–345. doi:10.1037/ppm0000203.
- Vohra, A., & Bhardwaj, N. (2019). Customer engagement in an e-commerce brand community: An empirical comparison of alternate models. *Journal of Research in Interactive Marketing*, Vol 13, pp. 2–25.
- Wang, W. Y. C., Pauleen, D. J., & Zhang, T. (2016). How social media applications affect B2B communication and improve business performance in SMEs. *Industrial Marketing Management*, Vol 54, pp. 4–14.
- Westberg, K., Stavros, C., Smith, A. C. T., Munro, G., & Argus, K. (2018). An examination of how alcohol brands use sport to engage customers on social media. *Drug and Alcohol Review*, Vol 37, No.1, pp. 28–35.
- Wiederhold, B.K. (2022) 'BookTok made me do it: The evolution of reading,' *Cyberpsychology, Behavior, and Social Networking*, Vol. 25, No. 3, pp. 157–158. doi:10.1089/cyber.2022.29240.editorial.
- Wijeyaratne, O., Resnick, S. & Poorrezaei, M. (2019), Exploring negative customer brand engagement in social media: A framework of antecedent and consequence. In *British Academy of Management Conference (BAM2019)*. Aston University, Birmingham, UK: British Academy of Management.

Criminalisation of Specific Forms of Online Communication: A South African Legal Perspective

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Abstract: One of the key findings of the South African Social Media Landscape 2022 study is that the growth in Internet access has, in turn, spurred the use of social media, leading to an estimated 48.8% (28 million) of South Africans being active on social media platforms, such as Facebook, Twitter, Instagram, YouTube, LinkedIn and TikTok. The down side is that online communication may not only become “viral” but it may also be harmful. Initially Internet regulation focussed primarily on the criminalisation of unlawful online conduct, referred to as a cybercrime, which includes hacking, DDoS attacks, but now the focus has been extended to the criminalisation of specific forms of online communication, referred to as communication offences, which include postings on Facebook or WhatsApp. The discussion deals with the criminalisation of specific forms of online communication in South Africa, the enforcement of communication offences with reference to the investigative powers of the police, with assistance from service providers, and the manner in which a balance between free speech and security is ensured. It does not deal specifically with the protection of users against harmful content, although a possible consequence of the criminalisation of communication is protection against these forms of communication.

Keywords: communication offences; free speech; legal role of service providers pertaining to communication offences, enforcement of communication offences; policing illegal communications.

1. Introduction

The entrenchment of the Fourth Industrial Revolution in society and the growth in access to the Internet and social media have resulted in an escalation of potentially harmful content on digital platforms. Governments such as the European Union (EU) member countries and the United Kingdom (UK) are undoubtedly taking a stricter approach as to what is acceptable and legal to post on social media. It is important to note that not all unacceptable communication will result in criminal liability.

The discussion with reference to the South African legal position focusses on an overview of the specific forms of communication which may result in criminal liability and the manner in which a balance between the right to freedom of expression, the protection of society from harm and social cohesion should be achieved (Serra, 2022).

It is noted that although specific forms of communication are criminalised, such criminalisation will not result in prosecution if the police do not have the capacity to investigate communication offences. The police need the service provider’s assistance and therefore attention should be given to the obligations and legal duties of the service provider.

Globally governments face similar challenges in regulating communication on the Internet and social media. A comparative study of other countries’ regulation of communication offences is beneficial as it provides a deeper understanding of a country’s own regulation and it may highlight strengths and weaknesses in the criminalisation and enforcement of specific forms of communication. Where relevant, reference will be made to the legal position outside of South Africa.

2. Regulation of online communication

There was a time when most forms of communication taking place in cyberspace had no legal consequences. Communication in cyberspace was mostly unregulated with the emphasis on an absolute right to free speech.

Over time it became clear that in the online environment the old expression “sticks and stones may break my bones, but words will never harm me” did not hold true. The use of social media as communication tool in South Africa has grown exponentially and with it the risk of possible harmful communication (Malinga, 2022). There have been numerous examples where online communication have caused harm. Young people below the age of 18 years are emotionally vulnerable and there is content on the Internet and social media that they should not be exposed to. For example, in 2017, a 14 year old UK teenager, Molly Russell, committed suicide. It was shown that in the period prior to her self-killing, social media companies actively recommended posts about self-harm and suicide, which contributed to her tragic suicide (de Urquía, 2022). The discussion does not specifically focus on the protection of children against harmful content, but as will be illustrated hereafter, a

possible consequence of criminalisation of specific forms of communication is protection against access to such communication.

It should be noted that child pornography and related issues constituted a crime in most countries at the inception of the Internet. The Internet exacerbates the distribution of child pornography and the possible abuse and exploitation of children in the production of child pornography. The protection of children against harmful communication on the Internet with specific reference to social media constitutes a discussion of its own. For purposes of this discussion, the primary legal question revolves around which specific forms of communication should result in criminal liability inter-linked with the role of the service provider in assisting the police with the investigation of a communication offence.

The harm that social media communication can cause was highlighted in July 2021 when the South African provinces, KwaZulu Natal and, to a limited extent, Gauteng experienced some of the worst violence, looting and arson in years. Social media platforms, such as, WhatsApp, Twitter and Telegram played a considerable role in the planning, co-ordination and incitement of the violence, looting and arson (see par 5 hereafter; Nxumalo, 2022; Pijoo, 2022;).

South Africa has joined a growing list of countries that are taking a legal stand on the manner in which their citizens communicate in cyberspace. Communication that causes harm must result in a legal consequence. How harm is defined is very important. Conceptualisation of terminology is important as it provides context to the communications offences. Harm is defined in the South African Films and Publications Act (see hereafter at par. 3.1.3) as *“causing emotional, psychological or moral distress to a person”*. Not all harmful communication will result in criminal liability but only the most serious forms of harmful communication. A crime is committed against society in general whereas civil liability concerns individuals in their capacity. For the purposes of this discussion, it is relevant to identify which forms of communication should result in criminal liability.

3. Criminalisation of specific forms of online communication

3.1 South Africa

3.1.1 Introduction

In January 2022 there were 41,19 million Internet users in South Africa. South Africa’s Internet penetration stood at 68,2 percent of the total population at the start of 2022 (<https://datareportal.com/reports/digital-2022-south-africa>).

Over the past 2 years South Africa has experienced a legal evolution regarding the criminalisation of specific forms of online communication. In December 2021, the Cybercrimes Act 19 of 2020 came into effect which provides inter alia for the criminalisation of specific forms of online communication. The Cybercrimes Act was followed by the Films and Publications Amendment Act 11 of 2019 that came into effect in March 2022 which also provides for the criminalization of specific forms of communication. The legislative criminalisation of specific forms of communication will be discussed hereafter (see par. 3.1.2. and 3.1.3). Although the criminalisation of specific forms of communication are welcomed, there are some reservations which will be discussed hereafter at par. 3.1.4 and 4.

3.1.2 Cybercrimes Act 19 of 2020

In December 2021, the Cybercrimes Act came into effect (see https://www.gov.za/sites/default/files/gcis_document/202106/44651gon324.pdf). The Act provides for the criminalization of

- unlawful conduct referred to as cybercrime; and
- malicious communications referred to as communication offences. The Cybercrimes Act uses the term, “malicious” communication. Although “malicious” is not defined, an inference is drawn that it refers to harmful communication. Harm is defined in the Films and Publications Act (see par. 2). The communication is defined as a “data message” which refers to data generated, sent, received or stored by electronic means, where any output of the data is in an intelligible form.

The following specific forms of communication are statutory offences:

1. Communication that incites damage to property or violence;

2. Communication that threatens persons with damage to property or violence;

The Cybercrimes Act defines the following terminology:

- “damage to property” as damage to any corporeal or incorporeal property;
- “group of persons” means characteristics that identify an individual as a member of a group, which includes without limitation, race, gender, sex, pregnancy, marital status, ethnic or social origin, colour, sexual orientation, age, disability, religion, conscience, belief, culture, language, birth or nationality; and
- “violence” means bodily harm.

3. The disclosure of an intimate image without the consent of that person (sometimes referred to as so-called “revenge pornography”). It is important to note that the amended Films and Publications Act also provides for the distribution of non-consensual intimate images (non-consensual adult pornography) as an offence.

In accordance with the Cybercrimes Act an “intimate image” means a depiction of a person

(i) real or simulated, and made by any means in which

(aa) B is nude, or the genital organs or anal region of B is displayed, or if B is a female person, transgender person or intersex person, their breasts, are displayed; or

(bb) the covered genital or anal region of B, or if B is a female person, transgender person or intersex person, their covered breasts, are displayed; and

(ii) in respect of which B so displayed retains a reasonable expectation of privacy at the time that the data message was made in a manner that

(aa) violates or offends the sexual integrity or dignity of B; or

(bb) amounts to sexual exploitation.

Any person who commits above-mentioned offences, is liable on conviction to a fine or to imprisonment for a period not exceeding three years or to both a fine and such imprisonment.

3.1.3 Overview of criminalised content in terms of the Films and Publications 65 of 1996 (as amended by the Films and Publications Amendment Act 11 of 2019)

On 1 March 2022, the Films and Publications Act 65 of 1996 was amended. The amendments as outlined in the Films and Publications Amendment Act 11 of 2019 (see https://www.gov.za/sites/default/files/gcis_document/201910/42743gon1292.pdf) were necessitated due to the manner in which the modern digital society communicate. The 1996 Act was in need of modernisation as it did not provide for communication on social media which is now predominantly user-generated and the communication may be harmful (Ellerbeck, 2022). The amended Films and Publications Act provides that social media “includes the various online technology tools and forms electronic communication via the Internet, such as websites for social networking and micro blogging through which users create online communities to share information, ideas, personal messages and other content”.

In accordance with the Films and Publications Act, a Film and Publications Board (referred to as the Board) acts as a regulator of content (Wrench, 2022). The Films and Publications Act considers everyone a distributor once they post content on online mediums. A distinction is drawn between two categories of distributors, namely

- a non-commercial online distributor who posts content intended for private or personal use; and
- a commercial online distributor who distributes via the internet for commercial purposes.

The emphasis in this discussion is on the non-commercial distributor who does not have to register as a distributor with the Board nor have their content classified (Wrench, 2022). However, the non-commercial distributor is not exempted from liability and may incur liability if:

- a private individual posts a communication that falls within the realms of prohibited content, and
- a member of the public reports this communication to the Board.

'Prohibited content' means content which amounts to propaganda for war, incitement of imminent violence, advocacy of hatred that is based on an identifiable group characteristic, and that constitutes incitement to cause harm. How harm and harmful are defined is also very important. Harm and harmful are defined as "*causing emotional, psychological or moral distress to a person*".

The Films and Publications Act provides for the following communication offences:

1. Any person who knowingly distributes private sexual photographs and films in any medium including the internet and social media, without prior consent of the individual or individuals in the said sexual photographs and films with the intention to cause the said individual harm shall be guilty of an offence and liable upon conviction to a fine not exceeding R150 000 or to imprisonment for a period not exceeding two years or to both a fine and such imprisonment.

The Films and Publications Act specifies that a photograph or film is 'private' if, judging from the context in which the photograph or film is taken or made, it was not intended by any individual in the photograph or film to be seen by others. Furthermore, a photograph or film is 'sexual' if such photograph or film:

- (a) it shows all or part of an individual's exposed female breasts, anus, genitals or pubic area;
 - (b) it shows something that a reasonable person would consider to be sexual because of its nature; or
 - (c) its content, taken as a whole, is such that a reasonable person would consider it to be sexual.
2. Any person who knowingly creates, produces or in any way contributes to or assists in any film or photograph which contains depictions, descriptions or scenes of sexual assault and violence against children, shall be guilty of an offence and liable upon conviction, to a fine not exceeding R150 000 or to imprisonment for a period not exceeding two years or to both a fine and such imprisonment.
 3. Any person who knowingly distributes in any medium, including the internet and social media, any film, game or publication which amounts to propaganda for war, incites imminent violence, or advocates hate speech, shall be guilty of an offence and liable upon conviction, to a fine not exceeding R150 000 or to imprisonment for a period not exceeding two years or to both a fine and such imprisonment.

The Films and Publications Amendment Act defines "hate speech" as "*any speech, gesture, conduct, writing, display or publication, made using the internet, which is prohibited in terms of section 16(2) of the Constitution of the Republic of South Africa, 1996, which propagates, advocates or communicates words against any person or identifiable group, which words could reasonably be construed to demonstrate a clear intention to be harmful, to incite harm and promote or propagate hatred against the said person or identifiable group.*"

Prior to 1 March 2022 the perpetrator of hate speech could be held civilly liable in terms of the Promotion of Equality and Prevention of Unfair Discrimination Act 4 of 2000 (referred to as the Equality Act) or criminally liable for the common law crime, *crimen iniuria* which is defined as the unlawful and intentional violation of dignity or privacy (Watney, 2021). The legal position since 1 March 2022 is that a person may be held civilly liable in terms of the Equity Act or criminally liable for the common law crime, *crimen iniuria*, or the statutory crime, hate speech. In the instances in which a perpetrator is prosecuted and convicted, it will result in a criminal record for such a perpetrator (Watney, 2021).

Much has been written on this specific form of communication (Watney, 2021). In November 2022 a white South African woman made the following voice note on a WhatsApp group: "...ban the black man. They rape, they steal, they kill, worse than any pit bull could, and they get away with it. Ban those who are making the laws, ban Ekurhuleni, ban the black man. Get all the black women and cut out their uteruses and their ovaries [so] that they can't procreate, because they will all turn out the same because they are all the same" (Tshkalanga, 2022). This may constitute an example of hate speech and she may be prosecuted either in terms of the common law crime, *crimen iniuria*, or the statutory crime, hate speech, in terms of the Films and Publications Act.

3.1.4 General observations

A piecemeal approach to criminalisation must be avoided. Against this proviso, it is not clear why the legislator decided to provide for specific forms of criminalisation in the Films and Publications Act. The offence of distribution of non-consensual images, already exist in other legislation, namely the Cybercrimes Act. The other specific forms could have been incorporated in existing legislation. The sentencing provision for the crime of non-consensual sexual images in the Cybercrimes Act provides for a 3 year imprisonment and/or fine upon conviction whereas in terms of the Films and Publications Act it provides for a 2 year imprisonment and/or fine

upon conviction. The latter sentencing provision for the same crime in different legislations causes legal uncertainty.

3.2 United Kingdom (UK)

3.2.1 Online Safety Act

The final version of the Online Safety Act has not yet been finalised (see <https://www.gov.uk/government/news/new-protections-for-children-and-free-speech-added-to-internet-laws> and <https://publications.parliament.uk/pa/bills/cbill/58-03/0209/220209.pdf>). One of the main aims of the Online Safety Act is to provide strong protection for children against harmful content.

In its November 2022 report, the Law Commission recommended the following new or reformed criminal offences to protect victims against online abuse and safeguard freedom of expression (see <https://www.lawcom.gov.uk/law-commission-recommendation-targeting-the-encouragement-of-serious-self-harm-to-be-included-in-online-safety-bill/>):

- a “harm-based” communications offence to replace the offences within section 127(1) of the Communications Act 2003 (“CA 2003”) and the Malicious Communications Act 1988 (“MCA 1988”);
- an offence of encouraging or assisting serious self-harm;
- an offence of cyberflashing *which involves sending obscene pictures to strangers online*;
- an offence of sending knowingly false communications, threatening communications, and making hoax calls to the emergency services, to replace aspects of the MCA 1988 and section 127(2) of the CA 2003; and
- an offence of epilepsy trolling which refers to intentionally sending flashing images to a person with epilepsy with the intention of inducing a seizure;

Since 2015, it has been an offence in England and Wales for someone to share a private sexual image or video (online or offline) of someone without their consent and with the intention of causing them distress. Under Section 33 of the Criminal Justice and Court Act 2015, this offence is punishable by up to two years in prison (see <https://www.gov.uk/government/publications/domestic-abuse-bill-2020-factsheets/threats-to-disclose-private-sexual-photographs-and-films>). Hate crimes are covered by legislation, namely the Crime and Disorder Act 1998 and section 66 of the Sentencing Act 2020. The police and the Crown Prosecution System have agreed on the following definition for identifying and flagging hate crimes: “Any criminal offence which is perceived by the victim or any other person, to be motivated by hostility or prejudice, based on a person's disability or perceived disability; race or perceived race; or religion or perceived religion; or sexual orientation or perceived sexual orientation or transgender identity or perceived transgender identity.” Since there is no legal definition of hostility, the everyday understanding of the word is used which includes ill-will, spite, contempt, prejudice, unfriendliness, antagonism, resentment and dislike (see <https://www.cps.gov.uk/crime-info/hate-crime>; also see <https://www.gov.uk/government/statistics/hate-crime-england-and-wales-2021-to-2022/hate-crime-england-and-wales-2021-to-2022>).

3.2.2 General observations

Providing for specific communication offences in different legislation makes for legal uncertainty. In my opinion, the South African reference to harm in the criminalisation of hate speech is preferable to the use of hostility. South Africa may take note of the proposed offences relating to cyberflashing, false communications and epilepsy trolling.

4. Role of service provider in assisting the police in the investigation of communications offences

4.1 South Africa

In terms of the Electronic Communications and Transactions Act 25 of 2001 the service provider does not have a general monitoring obligation. The Films and Publications Act provides that if an Internet access provider has knowledge that its services are being used for the hosting or distribution of child pornography, propaganda for war, incitement of imminent violence or advocating hatred based on an identifiable group characteristic, it must take all steps to report the presence of this content to the police. The Internet access provider must report the

particulars of the person maintaining, hosting, distributing or contributing to the internet address, to a police official, and take all reasonable steps to preserve evidence for purposes of investigation and prosecution by the relevant authorities. The Board has issued a legal notice to Internet service providers demanding that ISPs register and provide information on how they are preventing the use of their services for hosting prohibited material (Vermeulen, 2022).

Pertaining to the communication offences in the Cybercrimes Act, a complainant must lay a charge with the police and may apply to a magistrate's court for

- a protection order to prohibit any person to disclose or further disclose the data message; or
- an order that an electronic communications service provider whose electronic communication service is used to host or disclose the data message, remove or disable access to the data message.

A court may also order the service provider to furnish further particulars to the court in respect of the communication offence.

Although legislation provides for assistance by the service provider, this assistance can only be provided if it is aware that a communications offence has been committed or a complaint has been lodged with the police. In March 2021 a South African mother of five children was arrested after allegedly selling naked pictures of her 4-year-old daughter on the dark web. The FBI agent tracked the mother to Cape Town after she was allegedly paid through PayPal (Serra, 2022). In 2021 the United States (US) Homeland Security dispatched an agent to pretend to be a buyer in the transaction. The minister of police, Cele, indicated in 2022 that the South African police did not have the capacity to probe crimes committed through social media apps such as WhatsApp and Facebook, as these were "managed" in the US (Maliti, 2022). The latter submission is not correct. If a communication offence on social media is reported to the police, it can be investigated but the police is not capable of policing crimes committed on the Internet or dark web which is done in secret and does not result in a complaint. Unfortunately, the police may not have the expertise to investigate cybercrimes, let alone communication offence. The South African police will have to set up a dedicated cybercrime and communication offences unit to investigate online crimes (Vermeulen, 2022).

4.2 The UK Online Safety Act

The aim of the Act is to protect Internet and social media users against harmful content (see par. 3.2). In accordance with the Online Safety Act social media firms need to have a clear, easy to understand and consistently enforced terms of service. The Online Safety Act introduces what amounts to a general monitoring requirement and the mere conduit and liability shield provisions are not applicable (Horton, 2022). Service providers will be legally required to remove illegal content, take down material in breach of their own terms of service, and provide adults with greater choice over the content they see and engage with. The Act explicitly prohibits the service provider from removing or restricting user-generated content, or suspending or banning users in instances in which the users did not breach their terms of service or the law. The Act also introduce imprisonment of up to two years for directors of service provider companies who fail in their duty to protect children or who allow terrorist groups to exploit their platforms. The latter provides for corporate criminal liability and emphasises how serious the government is ensuring online safety.

4.3 European Union (EU) Digital Services Act

The Digital Safety Act updates the process by which digital service providers must act to rapidly delete illegal content based on national or EU law (see <https://eur-lex.europa.eu/legal-content/en/ALL/?uri=COM:2020:825:FIN>). The Act does not define what the illegal content would be, as the EU does not have competence over criminal law in the Member States. It will be defined by the Member States who will establish the precise content to be restricted according to their national law. Online platforms will not have to make the assessment of illegality, but will be asked to act on reports or notices submitted to them, which is referred to as the "notice and action procedure" (Horton, 2022). The Digital Services Act concentrates on "illegal" content and largely steers clear of regulating "harmful" content (Horton, 2022). It also reinforces an EU-wide ban on general content monitoring, such that platforms will not be forced to systematically police their platforms to the detriment of free speech (Horton, 2022). Platforms must provide affected users with detailed explanations if ever they block accounts, or else remove or demote content. Users will have new rights to challenge these decisions with the platforms and seek out-of-court settlements if necessary.

4.4 General observations regarding the role of the service provider in assisting the police

The aim of the Digital Service Act and Online Safety Act is to ensure illegal communication does not appear or is removed but the approaches differ. Horton (2022) refers to the Online Safety Act which provides for a general monitoring requirement unlike the legal position outlined in South Africa and the Digital Safety Act. Monitoring may be done by means of an upload filter. An upload filter intercepts content while the user is uploading it onto the platform, and it checks to see if there is a match for illegal content (Horton, 2022). This would occur continuously for all content. When it finds a match, it removes the content, effectively making it disappear before the user even knows what has happened. Taking into account that the amount of user-generated content has increased exponentially, such limited monitoring may be justifiable. Although a user has a right to free speech (see par.5 hereafter), such a right does not extend to illegal communication.

5. Human rights

There have always been conflicting positions on freedom of speech versus the right to dignity, privacy and security. After a few too many abuses of the “freedom of speech” defence, many of which have since been ruled as instances of hate speech, defamation, and incitement to violence, there are now legal consequences to online communication.

While users have the right to freedom of speech, they do not have the right to freedom from consequences in the form of liability. Criminal liability is the most serious form of liability and should only be applicable to the most harmful of communication. In 2022 the latter was confirmed by Media Monitoring Africa (MMA) director, William Bird, who made the following observation to the SA Human Rights Commission “any criminal sanctions for speech risk having a chilling effect on the exercise of the right to freedom of expression [and] must be approached with heightened caution” (Pijsos, 2022).

Criminal liability should not be abused for political motives. An example of such abuse is the 2022 incident in Nigeria in which a Nigerian university student, Aminu Mohammed, was arrested and detained for more than two weeks after he allegedly defamed President Muhammadu Buhari's wife in a tweet (Khalid, 2022). Defamation is not such a serious form of online communication that it should result in criminal liability and it definitely does not warrant an arrest and detention. The latter example seriously violates the constitutional rights to freedom of movement, dignity and privacy.

The possibility of declaring a state of emergency in order to shut down specific communication towers to prevent social media communication during the 2021 South African violence, looting and arson, was mentioned but not implemented (Nxumalo 2021). Such a drastic step would have resulted in weighing the right to free speech and access to information against security. It may have been justified taking into consideration that the violence, looting and arson resulted in loss of life, huge economic damage and unemployment (Nxumalo, 2021).

6. Conclusion

Traditionally the focus was on cybercrime and the investigation of cybercrime was prioritised. The harm that communication may cause is now internationally recognised. The amount of user-generated content has increased exponentially which makes policing challenging. Service providers play a crucial role in addressing illegal communications. Not all illegal communication will result in criminal liability but only the most harmful communication.

Although the communication offences in the South African Cybercrimes Act are welcomed, enforcement presents a major challenge. In the latter regard, South Africa may take note of how other countries are dealing with the enforcement of communication offences with reference to the service provider’s legal duties and obligations in assisting with the police investigation.

Addressing illegal communication in an effective and consistent manner may be challenging, but it is commendable that countries are legislating communication offences and setting up legal structures to deal with it.

References

de Urquia, B.V. (2022) “Human rights lawyer calls for ‘total rewrite’ of Online Safety Bill”, “[online], <https://eandt.theiet.org/content/articles/2022/10/human-rights-lawyer-calls-for-total-rewrite-of-online-safety-bill/>”.

- Ellerbeck, D. (2022) "Internet censorship? A look at the Films and Publications Amendment Act's criminalisation of "hate speech", [online], <https://forsa.org.za/internet-censorship-a-look-at-the-films-and-publications-amendment-acts-criminalisation-of-hate-speech/>.
- Horton, M. (2022) "Regulating big tech platforms: Content moderation requirements in the UK Online Safety Bill and the EU Digital Services Act", [online], <https://eu.boell.org/en/regulating-big-tech-platforms>.
- Khalid, I. (2022) "Nigerian student Aminu Adamu Mohammed accused of defaming Aisha Buhari", [online], <https://www.bbc.com/news/world-africa-63805455>.
- Malinga, S. (2022) "Half of SA's population now active on social media", [online], <https://www.itweb.co.za/content/rW1xLv5nGyP7Rk6m>.
- Maliti, S. (2022) "SA cops still in the dark after FBI intercepted the 'sale' of a 4-year-old Bonteheuwel child", [online], <https://www.iol.co.za/capeargus/news/sa-cops-still-in-the-dark-after-fbi-intercepted-the-sale-of-a-4-year-old-bonteheuwel-child-6a5751e6-5d61-4020-ab7c-ecb84df27c00>.
- Nxumalo, L. (2022) "July unrest: 'Social media fuelled unrest' [online], <https://www.iol.co.za/sunday-tribune/news/july-unrest-social-media-fuelled-unrest-481bbafe-1ce1-4ca7-87c9-7da6cfc652eb>.
- Pijoo, I. (2022) "Harmful disinformation sowed anger, violence, and anarchy during July unrest - media expert <https://www.news24.com/news24/southafrica/news/harmful-disinformation-sowed-anger-violence-and-anarchy-during-july-unrest-media-expert-20220304>
- Serra, G. (2022) "Case of mom accused of selling naked pictures of her daughter delayed by power outages", [online], <https://www.iol.co.za/weekend-argus/news/case-of-mom-accused-of-selling-naked-pictures-of-her-daughter-delayed-by-power-outages-7f8d0d81-c203-4944-a8f4-78ed1a95456e>
- Tshkalanga, S. (2022) "Woman who allegedly said black men were the problem, not pit bulls, arrested", [online], <https://www.dispatchlive.co.za/news/2022-11-27-woman-who-allegedly-said-black-men-were-the-problem-not-pit-bulls-arrested/>.
- Vermeulen, J. (2022) "Proposal to amend South Africa's constitution for Cyber Commissioner", [online], <https://mybroadband.co.za/news/security/468359-proposal-to-amend-south-africas-constitution-for-cyber-commissioner.html>.
- Watney, MM. (2021) "Regulation of hate speech on social media: a legal perspective" in Karpasitis, C *Proceedings of the 8th European Conference on Social Media (ECSM-2021)*, Reading, UK, pp.244 – 251.
- Wrench, J. (2022) "Alert | The Film and Publications Amendment Act is here – now what?" [online], <https://www.michalsons.com/blog/alert-the-film-and-publications-amendment-act-is-here-now-what/56248>.

Selfies as Practices of Care-Taking (and Giving)

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Abstract: Research on selfies finds that negative feedback in comments and the currency of likes reinforce and police dominant feminine or masculine beauty ideals, including binary gender ideals. For example, Döring et al. (2016) analysed 500 Instagram selfies to explore if they conform to gender stereotypes as identified in Erving Goffman's 1976 *Gender Advertisements*. The study revealed that gender stereotypical behaviours found in adverts are repeated in selfies, and that some of the behaviours feature in selfies more frequently than in magazine adverts. The prevalence of dominant beauty ideals in selfies is demonstrated in #bodypositivity and #curvyfit posts that tend to depict slender female and muscular male bodies (Webb et al, 2017). However, selfies are an important mode of self-presentation. Research on queer and fat activist selfies has highlighted their role in enhancing visibility, raising awareness of oppression and challenging stereotypes. In research with trans and gender-fluid Tumblr users, Vivienne (2017) found positive comments on selfies helped promote body acceptance and that users viewed trans and gender-fluid selfies as defying industries that promote binary beauty ideals and capitalise on consumer's insecurities. In my book *Consuming the Body: Capitalism, Social Media and Commodification* I argue that fat activist selfies challenge dominant modes of self-presentation and looking. This paper will draw on my research into selfie taking practices, and also a participatory research project around queering the gender binary (*Bois of Isolation* co-produced with Dr AC Davidson) to identify methods of producing creative selfies that evade commoditisation and discipline (#EmpoweringPresence, new project), and consider selfie taking and sharing as practices of care.

Keywords: Selfies, Care, LGBTQI+, Fat Activism, Body positivity, Neoliberal, Participatory Research.

1. Introduction

Research into selfie taking and sharing practices finds that negative feedback in comments and the currency of likes reinforce and police dominant feminine or masculine beauty ideals and binary gender stereotypes. Despite these negative impacts, selfies are an important mode of self-presentation. This paper draws on my research into selfie taking practices and a participatory research project around queering the gender binary to consider selfie taking and sharing as practices of care.

On social networking sites, selfies are viewed as 'advertisements for the self' and an important tool in the construction of a self-brand (Marwick, 2013 142). To produce a self-brand, an individual must view 'the self as a commodity for sale in the labour market, which must generate its own rhetorically persuasive packaging, its own promotional skin' (Hearn, 2008 201). As adverts, selfies reproduce the visual language of adverts. Veum and Undrum analysed the text accompanying selfie posts on Instagram and found that 'consumers are...applying the advertising style to their own texts' (2018 98). In stock photographs people tend to be depicted in a 'generalized, decontextualized and stylized way' so they appear to be symbols of a lifestyle, and this is replicated in the visual norms of selfies (Veum and Undrum, 2018 99). Users present themselves as decontextualised, generalised symbols: brands. Veum and Undrum conclude:

Individuals who publish self-portraits on social media networks such as Instagram (usually) do not have to fulfil commercial targets. Still ... they seem to adapt the homogenized multimodal language, thereby contributing to spreading values and interests of global corporations. As a consequence, SNS users get a rather narrow impression of how people, especially young girls, should behave and could look (2018 15).

The standards for socially acceptable selfies are informed by multiple codes and norms relating to gender, race, sexuality, class, and numerous other identity markers. For example, selfie-taking by white men is heavily stigmatised as narcissistic by white women who view male bathroom selfies as an extreme violation of acceptable masculine behaviour. In contrast, black and Latino men are not stigmatised for taking selfies, provided their selfies reinforce their community's masculine ideal and they do not take too many (Williams and Marquez, 2018 1781). Selfie-taking and sharing produce positive feelings that may also shield the selfie-takers from experiences of racism and discrimination (Williams and Marquez, 2018).

In his research into the selfie-taking practices of Moroccan-Dutch youths in Amsterdam, Koen Leurs found that gender stereotypes are 'powerful ideological models, to which users aspire in order to achieve social acceptance, make new friends, find romance and gain popularity' (Leurs, 2018 212). Leurs concludes that the participants may feel empowered by the attention and popularity that stereotypical gender performances produce, but there are also negative consequences because:

versions of femininity are increasingly becoming unattainable, leading to frustration and a loss of (peer-generated) self-worth. Additionally, exposing oneself implies susceptibility to victimization practices [...] that may put an end to the sense of agency users may have affectively felt (Leurs, 2018 212).

The exaggeration of gendered ideals in selfies is implied in research by Nicola Döring, and colleagues, who conducted content analysis of 500 selfies on Instagram to determine if they conform to the gender stereotypes identified by Erving Goffman in his 1976 study of photographs in magazines (Döring et al., 2015). In addition to Goffman's five categories, Döring added Kang's category of bodily display, which classifies how much of the body is revealed by the individual's clothing (Kang, 1997), and three categories deriving from selfies: muscle display; kissing or pouting face; and faceless portrayal. The study revealed that the gender stereotypical behaviours found in adverts are repeated in selfies and that some are featured in selfies more frequently than in the magazine adverts. These findings suggest that an intensification of gender stereotypes has taken place on social networking sites.

Although selfies allow an individual to produce an image of their choosing, they also increase self-surveillance and foreground the value of appearance, encouraging 'unhelpful body critique' (Grogan et al., 2018 24). Furthermore, 'the prolonged and intense interactions taking place on social media could amplify the impact of peer influence, as the judgment that each girl receives is collective, enduring, and public' (Chua and Chang, 2016 196).

Evidence of this is suggested by articles recently published in *The Wall Street Journal* reporting leaked information from Facebook relating to the impact of Instagram on mental wellbeing. Facebook employees with backgrounds in computer science, psychology, and quantitative and qualitative analysis carried out a 'teen mental health deep dive' (Wells et al., 2021 Online). The findings confirm conclusions already reached by researchers examining social media and selfies: selfies intensify self-scrutiny and peer comparisons which can contribute to low self-esteem and poor body image. However, spokespeople for the platforms continue to downplay the impact on young people's mental health. At a congressional hearing in March 2021 Mark Zuckerberg said: 'The research that we've seen is that using social apps to connect with other people can have positive mental-health benefits', and Adam Mosseri, the head of Instagram told reporters in May 2021 that negative effects on mental health were likely to be 'quite small' (Wells et al., 2021 Online). This brings to mind a description used by The Care Collective in their *Care Manifesto*, which paraphrases Hannah Arendt, saying 'a systematic level of *banality* permeates our everyday carelessness' (2020 45).

2. Body Positivity and Fat Acceptance Selfies

In popular visual culture, fat bodies are absent or subjectively erased (Woolley, 2023). However, since the 1960s, fat activists have fought to make fat bodies visible and valued. They organise demonstrations against fat prejudice, challenge dominant views, advocate for fat people and lobby companies accused of prejudice. Activists also reclaimed the word 'fat' as a descriptive term that does not carry the moral stigma or medicalisation of 'overweight' and 'obese' (LeBesco, 2004). In 1969, the National Association to Advance Fat Acceptance (NAAFA) was established in the USA and in the 1970s, former NAAFA members in San Francisco formed Fat Underground (FU), a radical feminist group. FU's 1973 Fat Liberation Manifesto asserts that fat women are ridiculed and exploited by 'commercial and sexist interests [...] thereby creating an immensely profitable market selling the false promise of avoidance of, or relief from, that ridicule' (Freespirit and Aldebaran, 1973 Online). Contemporary fat activists continue to draw attention to the prejudice experienced by fat people and challenge the assumed link between thinness and health. The Health at Every Size (HAES) movement emerged in the 1960s alongside the fat activist movement. HAES practitioners do not prescribe weight-loss treatments and instead focus on improving the emotional and physical well-being of fat people, in order to achieve good health at 'the weight you turn out to be when you are living a good life' (Burgard, 2009 44). In the 1990s, the Body Positivity movement became popular, using feminist discourse of empowerment and a rhetoric of self-love to reduce social stigma and increase the visibility of fat bodies. However, in her discussion of three Body Positivity websites featuring user-generated content, Alexandra Sastre says the websites

frequently function as spaces where a particular mode of acceptability is modeled to those liminal bodies that...[are] not-quite thin enough to stand in as an ideal, not-quite large enough to incite panic, and not-quite visible enough to merit attention. Therefore, many of these sites problematically emerge as channels through which to construct proprietary boundaries around

normativity despite their paradoxical emphasis on dismantling bodily standards altogether (Sastre, 2014 930).

By expanding but not rejecting the definitions of an acceptable body, the movement 're-inscribes, rather than liberates, the body' (Sastre, 2014 930). Many of the photographs published on the websites present bodies as fragments, predominantly the torso but also 'other body parts, often identified as the area of the body the subject feels most insecure about' (Sastre, 2014 936). The bodies are presented in a manner reminiscent of the magnifying, dissecting gaze commonly found in advertising in which the 'flawed' body parts are the only parts that are shown (Woolley, 2023).

Research shows that #HealthAtEverySize, #CurvyFit, and #Fatspiration posts contain greater racial and body diversity than #BodyPositivity and #Fitspiration posts (Webb et al, 2017). In #HealthAtEverySize and #Fatspiration posts, full or ¾ body length shots are common and body fragmentation is rare. However, like body positivity images, #HealthAtEverySize and #Fatspiration photographs predominantly show high 'normal weight' and low 'overweight' bodies, and so they marginally extend the boundaries of acceptable bodies without challenging them. Disturbingly, HAES posts have been found to contain the same amount of fat stigmatising content as fitspiration posts (Webb et al, 2017). Similarly, #CurvyFit photographs do not depict very fat bodies, and like #Fitspiration, present 'a stronger appearance-focus orientation to "fitness" and "health"' and often emphasise 'weight loss, body modification (e.g., before-and-after images), and objectification (e.g., exposing bare midriff and visible cleavage)' (Webb et al, 2018 Online). HAES content tends to focus on exercise and healthy eating, whereas #Fatspiration posts are more likely to present fashion and beauty content 'exemplifying how beauty and style are attainable and not privileges reserved only for thin women' (Webb et al, 2017).

Fat Acceptance selfies have been found to critique the positive and negative aspects of creating and sharing selfies. Afful and Ricciardelli analysed the content of four fat acceptance blogs and found that gender stereotypical beauty ideals are reproduced in some of the posts (Afful and Ricciardelli, 2015). Marianne Kirby, one of the bloggers that features in the study writes:

No bold colors, no stripes, nothing that would ever make us look bigger. [...] we draw less attention to ourselves when we comply with fashion rules. We occupy less space, metaphorically if not physically. We minimize ourselves for the comfort of other people. It reinforces the sense of shame we're supposed to feel because of our bodies, until we police ourselves (Afful and Ricciardelli, 2015 463).

However, Kirby does not feel shame because she rejects and disrupts dominant social ideals: 'sometimes I like to dress to piss people off – I like to use color and texture and certain pieces of clothing really aggressively to provoke reactions' (Afful and Ricciardelli, 2015 464). She demands the right to be visible and in doing so, Kirby, and other fat activists

extend modes of fat embodiment [...] by refusing to present their size as an unfortunate reality that thinner people should tolerate, and instead embrace their bodies by performing their fatness (e.g., wearing clothes that highlight it) to pressure their audience to confront their own fat biases (Afful and Ricciardelli, 2015 463–4).

Fat Acceptance activists reject the shameful fat identity. They demand to be seen as complex individuals and in forcing viewers to confront their own prejudice they may be viewed as empowering. Tiidenberg writes that selfies may be empowering, rather than offering rewards to the selfie-taker for conforming to social ideals, if they produce 'a personal sense of power and control, which carries the potential for social impact through exerting influence on existing discourses and ways of looking' (Tiidenberg, 2018 95).

3. Queer Selfies and Care

On social networking sites, selfies are viewed to be liberatory, but they are double-edged swords: Peer pressure, social expectation, and shame, compel people to post selfies, and the types of selfies they take are constrained by complex social expectations and ideals. They contribute to the competitive neoliberal environment in which the body is a sign of success and source of bodily capital (Woolley, 2023). They can also reinforce social hierarchies and inequalities because being visible is experienced as empowering or disciplining depending on the individual's social status and the type of body they possess. Those who are white, able-bodied, middle-class, heterosexual, and thin are likely to be visible for praise but less visible to negative scrutiny. Marginalised people are likely to be visible for criticism and overlooked in terms of their needs, desires, and values (Gailey, 2014).

Online aggression is also common, and LGBTQI+ people are 2 to 4 times more likely to be attacked online than heterosexual people (Felmlee, 2020 17).

Selfie practices and the social media platforms on which they are shared seem to produce risk and harm, rather than care. As adverts for the self, selfies reinforce the neoliberal ideal of an individual working alone in competition with others. They seem to exclude the mutual dependency and vulnerability that care taking and giving require. Indeed, Hil Malatino writes that a 'care web' specifically isn't 'exploitative, appropriative, or alienated... it challenges us to be deliberate, to communicate capacity, to unlearn the shame that has become attached to asking for, offering, and accepting help when we've been full-body soaked and steeped in the mythos of neoliberal, entrepreneurial self-making' (2020 2).

However, communities of care do coalesce around selfie-taking and sharing practices, particularly in LGBTQI+ communities. Research has found that selfie-takers are empowered to present themselves in a manner that challenges stereotypes, affirms the complexity of gender-fluidity, and provides visibility for people who are under-represented in mainstream media (Duguay, 2016). Vivienne undertook research with trans and gender-fluid Tumblr users, who report that positive comments from other users are self-affirming and enable body acceptance. The participants benefit from seeing diverse bodies online, and view trans and gender-fluid selfies as empowering expressions of defiance against beauty industries that promote binary beauty ideals and capitalise on consumer's insecurities (Vivienne, 2017). In this respect, selfies that unashamedly present diverse bodies, genders, and sexualities disrupt the disciplinary aspect of social networking sites. Additionally, sequential selfies by trans participants enable individuals to closely examine their bodily changes. One of the participants in Vivienne's research, took a selfie each month to 'analyse the soft-tissue changes around her face that are hard to see in daily observation', and shared the photographs on Facebook so her friends and family can follow her transition (LB quoted in Vivienne, 2017 136). In this respect, the selfies contribute to 'forms of care that enable co-constituted, interdependent subjects to repair, rebuild, and cultivate resilience in the midst of, and in the aftermath of, experiences of overwhelming negative affect' (Malatino, 2020 43).

Research shows that selfies raise awareness and challenge stereotypes, *and* reinforce dominant ideals. They can contribute to a more inclusive visual culture online and disrupt existing power hierarchies that determine who is worthy of being seen, but they also increase opportunities for surveillance and hostility. In their selfies, individuals are encouraged to assimilate to dominant social ideals that are gender-stereotypical, ableist, sizeist, and predominantly white, middle-class, and heteronormative. These conflicting characteristics of selfies bring to mind Baraitser's description of care as:

durational practices that keep "things" going...These durational practices are forms of labour that maintain the material conditions of ourselves and others, maintain connections between people, people and things, things and things, people and places, and social and public institutions, along with the anachronistic ideals that often underpin them, and that constitute the systems of sustenance and renewal that support "life". Maintenance is in part generated by conditions of vulnerability that we all share, and in part by the excesses and internal logics of capitalist cultures that make maintenance so necessary (Baraitser, 2015b 21).

Selfies enable maintenance activities: liking, commenting and sharing are acts that maintain supportive networks and online communities, but selfies can also maintain anachronistic ideals in the form of binary gender and beauty ideals. Therefore, it is important to find ways to participate in selfie cultures online that are resilient to these ideals, and resist assimilation and discipline.

4. @BoisOfIsolation

My current research considers how creative methods can be used to increase visual literacy around gender stereotypes and visual power imbalances so that selfie taking practices might also be practices of care. In the Bois of Isolation Instagram project, that took place during lockdown in collaboration with Dr AC Davidson, we aimed to explore how selfies might disrupt dominant visual representations of the gender binary. We created a space in online workshops in which participants could choose to remain invisible if they wished to (not switching their webcam on) and were under no pressure to share the selfies they took. We wanted to create what Cowan and Rault describe as 'public space [...] constituted by something like the negotiated intimacies and ethics of risk' in which participants are enabled to express their vulnerabilities but continue to feel safe (Cowan and Rault, 2018 130).

We also shared resources in the form of a series of our own ‘spoof’ self-portraits that identify gender stereotypes and visual power imbalances.

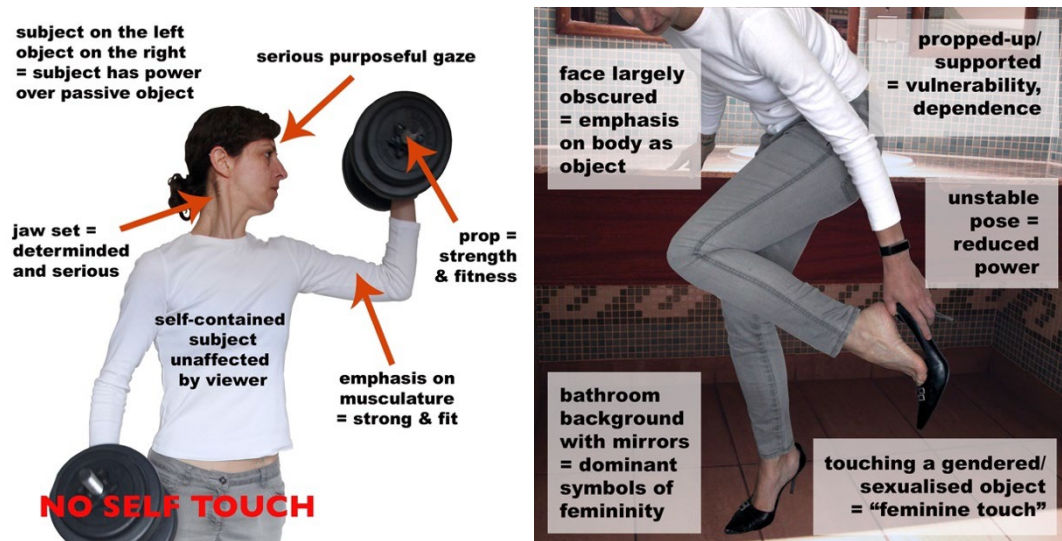


Figure 1: Spoof Instructional Selfies by AC. Davidson and D. Woolley. *Bois of Isolation Instagram Project* (<https://www.instagram.com/boisofisolation/>), UK (2020)

These annotated images aimed to enhance visual literacy and were informed by the content-analytical schemes devised by Goffman, Kang, Döring and others. In many ways these spoof images mimic and parody the binary gender performances that we hoped to disrupt in our project.

We also took selfies and shared them online in order to learn from the experience and to reduce the power imbalance between researchers and participants. It was our intention to work collaboratively with participants to co-produce knowledge through our discussions in workshops and on Instagram regarding the visual patterns and tropes we observed in the selfies participants shared. We invited participants to comment on groupings of selfies that displayed similar or different but related characteristics. This produced limited responses on Instagram, but during workshops participants gave written and verbal descriptions of their intentions and interpretations of the images and in email conversations some participants said they planned to use the methodologies in their own research projects in the future. The intention to develop ideas in collaboration with participants resembles the circular system of research that values process over product, called for by Dorothy Kim and Eunsong Kim in their “#TwitterEthics Manifesto”, which they describe as ‘sharing and shuffling the analysis feedback loop so it allows folks to ask questions to the data themselves’ (Kim and Kim, 2018 Online).

To allow for a range of gender expressions, we asked people to submit multiple selfies that queer the gender binary. We wanted to defy the idea of a single, coherent identity and avoid pairs of images that might imply a gender binary or the ‘before’ and ‘after’ transformation common in adverts. The groups of selfies also enabled us to present gender and identity as something that may change over time and in differing contexts, therefore presenting our selves as ‘multiversal beings’ to use Barker and Iantaffi’s term (Barker and Iantaffi, 2019 202). Barker and Iantaffi suggest that using both/and thinking will help us to escape the binarism of either/or thinking that pits female against male, healthy against unhealthy, fat against thin and good against bad, leaving no space in between for nuance and variation. They write: ‘Both/and requires us to move away from the rigid binary of either/or—which closes down possibilities—to consider a binary that opens up more possibilities’ (Barker and Iantaffi, 2019 203). Employing this mode of thinking in selfies could result in montages or series of images showing different aspects of identity, lifestyle, pleasures, and displeasures. Multiversal beings present a challenge to social media platforms that require each user to present a singular, coherent identity in order to more effectively sell their data and attention. They would enable code switching: blending signs and values to express a range of identity markers and potentially destabilise dominant values in the process. These selfies could also challenge the human centrality of consumer culture, blending the self with different objects, places, and people, to give a complex impression of life in a moment in time.

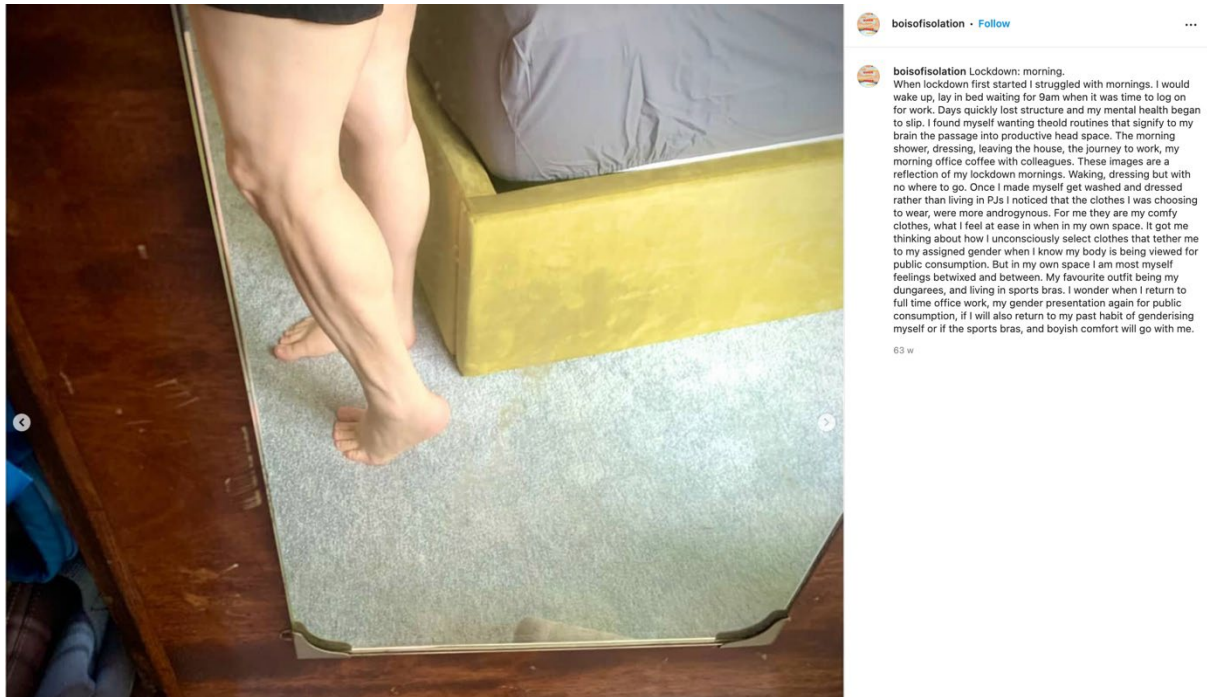


Figure 2: Selfie by A. Homes. Bois of Isolation Instagram Project (<https://www.instagram.com/boisofisolation/>), UK (2020)

In their selfies, participants creatively present their bodies, whole or as fragments that challenge binary gender expectations and body ideals. They also focus on body hair, facial expressions and props to destabilize normative ideals. Like the fat acceptance activists who extend modes of fat embodiment in their selfies in order to challenge fat prejudice, these selfies extend modes of presentation by foregrounding their marginalized gender and sexualities. However, presenting selfies that highlight marginalized characteristics in which individuals are identifiable leaves those individuals open to hostility and censure from other users.

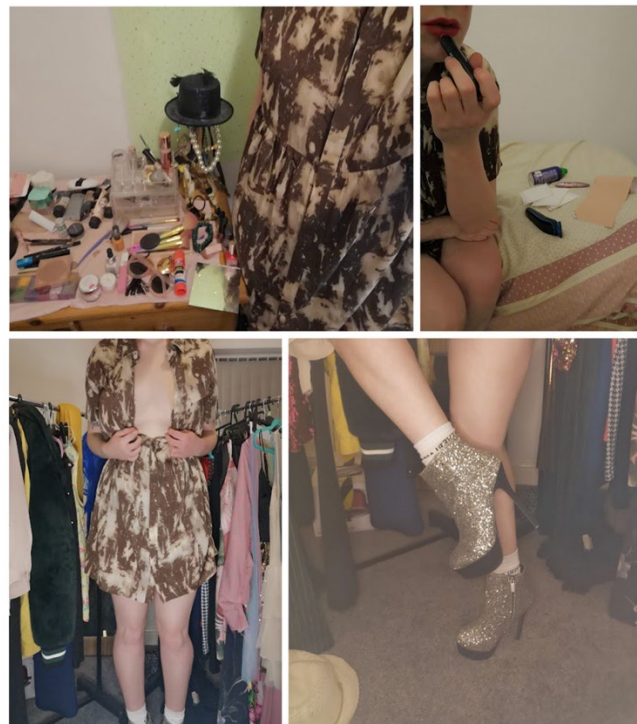


Figure 3: Selfie by H. Nona. Bois of Isolation Instagram Project (<https://www.instagram.com/boisofisolation/>), UK (2020)

5. Abstracted and Empowering Presence

During the process of making selfies AC and I unexpectedly received glitchy selfies produced by our smartphones when uploads to Instagram fail. Legacy Russell, a curator, writes that queer bodies are glitchy because they 'are encrypted' and 'not meant to be easily read' (2020 147). The glitch dissolves the body and renders 'our factual fragments [...] scrambled, [and] unreadable' (Russell, 2020 68).



Figure 4: Glitch Selfie by D. Woolley and AC. Davidson. *Bois of Isolation Instagram Project* (<https://www.instagram.com/boisofisolation/>), UK (2020)

Image degradation, such as glitch, blur and pixelation, may also produce images that disrupt the dominant modes of looking. Artist Hito Steyerl writes:

Focus is identified as a class position, a position of ease and privilege, while being out of focus lowers one's value as an image. The contemporary hierarchy of images, however, is not only based on sharpness, but also and primarily on resolution [...] a high resolution image looks more brilliant and impressive, more mimetic and magic, more scary and seductive than a poor one. It is more rich, so to speak (Steyerl, 2012 33).

Low resolution, blurred images are outside the system of value that preferences sharpness and high resolution, and so 'their status as illicit or degraded grants them exemption from its criteria' (Steyerl, 2012 38). Pixelated, blurred selfies may be exempt from comparison against neoliberal white, ableist, thin, and heteronormative body ideals.

In *Trans Care* Malatino writes that 'there is comfort in abstraction ... It names the linguistic and epistemological crisis we regularly produce and also a fantasy structure of reprieve where we might, for just a moment, leave that crisis behind' (2020 29). In relation to an experience of viewing a billboard by Jonah Welch featuring an abstract design with a pro-trans message Malatino writes 'Anonymous, named but not represented, and hailed in the complexity of my need—to be seen and unseen simultaneously, to be comforted and also left alone, to, for once, feel held and witnessed within a public space without being made subject to other people's witness of me' (2020 29). Using glitch, montage, pixelation and blur in selfies, individuals can be visible and confrontational,

masked and obscured, while preventing categorisation and comparison in relation to white, ableist, heteronormative neoliberal ideals.

6. Conclusion

Selfies are an important mode of self-expression that provide positive affirmation and communities of care for marginalised communities. Fat acceptance selfies present fat bodies without shame, expanding the types of bodies seen online, without assimilating to sexualised, gendered norms. Similarly, queer selfies also contribute to a more diverse online visual culture of bodies while challenging binary gender stereotypes in relation to marginalised genders and sexualities. However, selfies that present marginalised bodies in which the selfie-taker is identifiable remain vulnerable to online hostility from other users expressing fat- homo- and transphobia. The visual methods of abstraction and ambiguity that I am developing aim to create a caring space similar to that described by Malatino. The images do not escape the need for self-presentation and self-exposure, and they carry the risks attached to being visible in the public sphere. However, they also present opportunities to play with identity and offer a way of being present, without being subjected to discipline and recuperation. They enable marginalised individuals to take part in caring communities with expressions of vulnerability while minimising risks associated with vulnerability.

References

- Afful A. A., and Ricciardelli, R. (2015) "Shaping the online fat acceptance movement: talking about body image and beauty standards", *Journal of Gender Studies* 24/4, pp. 453–472.
- Baraitser, L. (2015) "Touching Time: Maintenance, Endurance, Care", *Psychosocial Imaginaries: Perspectives on Temporality, Subjectivities and Activism*, ed. Stephen Frosh, Basingstoke: Palgrave, 2015, 21–47, p. 21.
- Baraitser, L. (2015b) "Touching Time: Maintenance, Endurance, Care", in *Psychosocial Imaginaries: Perspectives on Temporality, Subjectivities and Activism*, ed. Stephen Frosh, Basingstoke: Palgrave, 2015, 21–47.
- Barker, M-J. and Iantaffi, A. (2019) *Life Isn't Binary: On Being Both, Beyond, and In-Between* (London and Philadelphia, PA: Jessica Kingsley Publishers.
- Burgard, D. (2009) "What is 'health at every size'?", in Rothblum and Soloway (eds), *The Fat Studies Reader*, New York: New York University Press, pp. 42–53.
- The Care Collective, (2020) *The Care Manifesto: The Politics of Interdependence*, London and New York: Verso.
- Chua, T. H. H., and Chang, L. (2016) "Follow me and like my beautiful selfies: Singapore teenage girls' engagement in self-presentation and peer comparison on social media", *Computers in Human Behavior* 55, pp. 190–197.
- Cowan, T.L. & Rault J. (2018) "Onlining queer acts: Digital research ethics and caring for risky archives", *Women & Performance: a journal of feminist theory*, 28:2, 121-142, DOI: 10.1080/0740770X.2018.1473985.
- Döring, N., Reif A., and Poeschl, S. (2016) "How gender-stereotypical are selfies? A content analysis and comparison with magazine adverts", *Computers in Human Behaviour* 55, pp. 955–962.
- Duguay, S. (2016) "Lesbian, gay, bisexual, trans, and queer visibility through selfies: comparing platform mediators across Ruby Rose's Instagram and Vine presence", *Social Media + Society* April–June, pp. 1–12.
- Felmlee, D, Rodis P. I., and Zhang, A. (2020) "Sexist slurs: reinforcing feminine stereotypes online", *Sex Roles: A Journal of Research* 83/1–2, pp. 16–28.
- Frespirit, J. and Aldebaran (1973) "Fat liberation manifesto" (1973). Available at <https://laurietobyedison.com/body-impolitic-blog/tag/fat-liberation-manifesto/> (accessed 20 January 2019).
- Gailey, J. A. (2014) *The Hyper(in)visible Fat Woman: Weight and Gender Discourse in Contemporary Society*, New York: Palgrave Macmillan.
- Grogan, S., Rothery, L., Cole J., and Hall, M. (2018) "Posting selfies and body image in young adult women: the selfie paradox", *The Journal of Social Media in Society* 7/1, pp 15–36.
- Hearn, A. (2008) "'Meat, mask, burden': probing the contours of the branded 'self'", *Journal of Consumer Culture* 8/2, pp. 197–217.
- Kang, M-E. (1997) "The portrayal of women's images in magazine advertisements: Goffman's gender analysis revisited", *Sex Roles* 37/11–12, pp. 979–996.
- Kim, D., & Kim, E., (2014) The #TwitterEthics Manifesto: You don't need to speak for us -- we are talking, April 7th, <https://modelviewculture.com/pieces/the-twitterethics-manifesto>.
- LeBesco, K. (2004) *Revolt Bodies? The Struggle to Redefine Fat Identity*, Amherst, MA: University of Massachusetts Press.
- Leurs, K. (2015) *Migrant Youth 2.0: Diaspora, Gender and Youth Cultural Intersections*, Amsterdam: Amsterdam University Press.
- Malatino, H. (2020) *Trans Care*, Minneapolis and London: University of Minnesota Press.
- Marwick, A. E. (2013) "Instafame: luxury selfies in the attention economy", *Public Culture* 27/1, pp. 137–160.
- Russell, L. (2020) *Glitch Feminism: A Manifesto*, London and New York: Verso.
- Sastre, A. (2014) "Towards a radical body positive", *Feminist Media Studies* 14/6, pp. 929–943.
- Steyerl, H. (2012) *The Wretched of the Screen*, Berlin: Sternberg Press.

- Tiidenberg, K. (2018) *Selfies: Why We Love (and Hate) Them*, Bingley: Emerald.
- Veum, A. and Undrum, L. V. M. (2018) "The selfie as global discourse", *Discourse and Society* 29/1, pp. 86–103.
- Vivienne, S. (2017) "'I will not hate myself because you cannot accept me': problematizing empowerment and gender-diverse selfies", *The International Journal of Media and Culture* 15/2, pp. 126–140.
- Webb, J. B., Vinoski, E. R., Bonar, A. S., Davies A. E., and Etzel, L. (2017) "Fat is fashionable and fit: A comparative content analysis of Fatspiration and Health at Every Size® Instagram images", *Body Image* 22, pp. 53–64.
- Webb, J. B., Thomas, E. V., Rogers, C. B., Clark, V. N., Hartsell E. N., and Putz, D. Y., (2018) "Fitspo at every size? A comparative content analysis of #curvyfit versus #curvyvyyoga Instagram images", *Fat Studies*, n.p. Available at <https://doi.org/10.1080/21604851.2019.1548860> (accessed 2 August 2019).
- Wells, G., Horwitz J., and Seetharaman, D. (2021) "Facebook knows Instagram is toxic for teen girls, company documents show", *The Wall Street Journal*, 14 September, Available at <https://www.wsj.com/articles/facebook-knows-instagram-is-toxic-for-teen-girls-company-documents-show-11631620739> (accessed 20 September 2021).
- Williams, A. A., and Marquez B. A. (2015) "The lonely selfie king: selfies and the conspicuous prosumption of gender and race", *International Journal of Communication* 9, pp. 1775–1787.
- Woolley, D. (2023) *Consuming the body: Capitalism, social media and commodification*, Bloomsbury: London.

PhD Research Papers

Factors Influencing Information Adoption from Social Media About COVID-19 by Saudi Citizens

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Abstract: Social networking sites comprise an open world where anyone can share different types of information. During the Covid-19 pandemic, people's social isolation made social media particularly important, and it has emerged as an important platform for sharing health information. The credibility of the information, however, is questionable. Therefore, this study aims to understand attitudes towards using social media as an information source among social media users in Saudi Arabia. Specifically, it seeks to examine the propensity of individuals towards using health information from social media platforms and whether individuals demographic factors (such as gender) impact information adoption. Based on using an online questionnaire incorporating a novel vignette design to measure participants' perceptions of information sources on social media platforms. The findings revealed that there is a high use of social media platforms among the Saudi population and that verified accounts on social media platforms, same gender and nationality positively affect the propensity towards adopting information.

Keywords: Information Adoption, Verification Mark, Social Media, Vignettes.

1. Research background and questions

Nowadays with the increased use of social networking sites, it has become easy to access and share different types of information. The credibility of the information, however, is increasingly being called into question; credibility refers to the truth or believability of information. The dissemination of rumours and inaccurate information through social media has led researchers to investigate factors affecting the credibility of information. With the rapid development of social media, several new technical factors (e.g., verified accounts feature) play a role in the judgement of information credibility in this media. Furthermore, Yin et al (2018) stated that other factors, such as individual differences (e.g., gender) could be considered influential in evaluating information credibility. Hence, Yin et al. and Verma, Fleischmann & Koltai (2018) argue for the need for more studies to examine the role of gender differences and other demographic characteristics in credibility judgement, and in shaping the trust of Internet users.

A recent study by Allington et al (2021) focused on using social media as an information source about conspiracy theories about COVID-19 or general health information. In terms of COVID-19, the conspiracy theories refer to a set of beliefs about the virus's origin or beliefs that it is just a '*big trick*' (Allington et al., 2021). Their study revealed two interesting findings: 1) there is a negative relationship between using social media as an information source about COVID-19 and following health behaviours (e.g., hand-washing). 2) Social media use influences positively on believing in conspiracy theories about COVID-19. The findings from Allington et al.'s (2021) study were a motivation for the present study, as the use of social media as health information source may lead to the adoption of false information. Moreover, the individual differences between social media users could influence their attitudes towards evaluating information credibility. Thus, such differences need to be considered, in addition to other factors affecting evaluating information credibility, such as source credibility or message quality.

Furthermore, Sbaffi & Rowley (2017) argue for the need to conduct more studies about online health information credibility in non-Western countries, since most of the existing studies of online health information credibility have been conducted in Western countries (e.g., USA and UK). Conducting more studies in non-Western countries that have different cultures, such as Saudi Arabia, could lead to different findings concerning the information credibility of social media. Therefore, this study will focus on evaluating information credibility among social media platforms in Saudi Arabia. In particular, it aims to understand Saudi population's attitudes towards using social media as a health information source. Hence, two research questions are addressed as follows:

Q1. What factors influence the adoption of social media health information among social media platforms users in Saudi Arabia?

Q2. How do the demographic factors of individuals affect the evaluation of health information credibility on social media platforms?

This study aims to add to the knowledge base regarding information credibility on social media platforms by providing insightful findings to information systems field, researchers and health professionals. The findings will identify the Saudi population's attitudes towards published health information on social media platforms, and which factors influence their attitudes. Hence, the health sector in Saudi Arabia and health professionals can more effectively utilise social media platforms as information source. This study's results may also encourage scholars to carry out similar or comparative studies in the future. Finally, a practical contribution concerns social media usage in the middle east countries, since most of the studies in this field have been conducted in western countries.

2. Literature review and hypotheses

2.1 Information Adoption

A related concept to seeking and using information is information adoption, which is referred to in the Oxford dictionary as “choose to take up, follow, or use” (Stevenson, 2010,p22). This word have been used widely in information credibility studies in different contexts such as online environment (e.g., Hussain et al., 2018) and social media (e.g., Erkan & Evans, 2016). Adoption of information refers to the extent to which the veracity of perceived information is evaluated and accepted as meaningful (Watts & Zhang, 2008). It mainly focuses on the process which information receivers use, evaluate and accept information. Based on reviewing the literature we found that information adoption is influenced by different factors, in particular content quality and source credibility (Sussman & Siegal, 2003). Source credibility can be measured using source expertise which refers to a set of characteristics of the message source, such as skills and knowledge (Rieh, Bates & Maack, 2010). Previous studies found that source expertise has a positive relation with adopting online and social media information (e.g., Filieri, Hofacker & Alguezaui, 2018; Syn & Kim, 2013). Thus, the following hypothesis has been formulated:

H1. Source expertise has a significant positive influence on perceived information adoption.

Another important dimension to information adoption is homophily, which is defined by Shamhuyenhanzva et al (2016, p. 440) as “the tendency of individuals to associate and bond with similar others who possess the same attributes and characteristics”. It can be derived from perceived attributes (e.g., beliefs) or demographic factors (e.g., gender). Previous studies found that web and social media credibility and users' attitudes towards accepting information are significantly affected by homophily status (similarity) among internet users (e.g., Steffes & Burgee 2009). Studies revealed that receiving information from people who have **similar demographic factors (e.g., gender and nationality)** has a significant impact on the credibility of online information (Bracamonte & Okada, 2015; Hirvonen, Tirroniemi & Kortelainen, 2018). Thus, the following hypothesis has been formulated:

H2. The degree of similarity (in nationality & gender) between information source_receivers has a significant positive influence on perceived information adoption.

Moreover, with the recent development of social networking sites, account verification has become one of the influencing factors in the credibility of information published on verified accounts. Verified accounts refers to those accounts whose identity has been checked and validated by the platform management and granted a verification stamp (e.g., ). Previous studies found that individuals are more likely to seek and trust information from verified accounts than unverified accounts (e.g., AlMansour & Iliopoulos, 2015). This indicates that such technical feature as verification stamp could have an impact on adopting social media information among social media users. Thus, the following hypothesis has been formulated:

H3. The verification symbol on social media influence positively on perceived information adoption.

3. Research methodology

An online closed-ended questionnaire was used as the research method in this study for several reasons. First, Granjon & Benedic (2017) consider the online questionnaire as an appropriate method to reach computer literate users such as social media users. Hence, as this research will target social media users, publishing an online questionnaire will be a useful method for reaching a wide variety of respondents. Second, this research will target social media users in Saudi Arabia, which is one of the largest countries in the Middle East (Central

Intelligence Agency, 2020). Hence, as pointed out by Saunders, Lewis & Thornhill (2009), an online questionnaire could be a useful tool to reach respondents from geographically separated areas. Third, Saunders, Lewis & Thornhill (2009) state that questionnaires could be the most suitable method for examining relationships between variables. In this study, the questionnaire incorporates an experimental vignette design, which is defined as a collection of brief descriptions that can simulate the real world (Hou et al., 2021). Vignette is a valuable method for obtaining the participants' opinions or 'intended behaviour' toward multiple scenarios (Atzmüller & Steiner, 2010, p. 129). It is also a useful approach for combining different variables and manipulating them. Hence, using a vignette describing source characteristics within a questionnaire in this research could answer the research questions by investigating the relationship between various factors of information adoption on social media. Furthermore, Evans et al., (2015) suggest that bias may occur when asking participants direct questions or using closed-ended questions with predetermined answers. Therefore, implementing alternative methods, such as vignettes, may aid in preventing or reducing such bias. In other words, involving participants in hypothetical scenarios as vignettes may encourage them to carefully think and evaluate the situation, resulting in more realistic responses.

3.1 Questionnaire design

The questionnaire started with demographic questions about age, gender, education and social media usage. Also, a Five-point Likert scale from 1) strongly agree to 5) strongly disagree was used to measure information quality on social media. Questions of this scale were adopted from (Wixom & Todd, 2005; Hsu et al., 2016; Sulaiman, Adeyemi & Ayegun, 2020 & Steffes & Burgee, 2009).

In order to achieve the research aim and examine the factors that influence information adoption on social media platforms, a novel experimental design (vignettes) has been adopted in this study. Essentially, we designed different types of profiles of Twitter accounts. As been discussed in the literature review, we identified three characteristics of the source that influence assessments of information credibility on social media: expertise, verification mark and homophily. Since the accounts on social media platforms might be verified – have the verification stamp near the account holder, (e.g. blue check on Twitter) – or unverified, we used the verification feature as a main factor for designing the experiments patterns. Specifically, we have two patterns of experiments: pattern A for a verified account, and pattern B for unverified account, and under each pattern we have 3 groups of profiles. Group 1) Medical expertise: as we addressed in H1 source expertise is predicted to have a significant positive influence on perceived information adoption. Based on this hypothesis, we designed two profiles of accounts on social media platform. Both accounts have a medical expertise and the same nationality as the participants (Saudi). Group 2) Non-medical expertise: in order to make a comparison with group 1, we designed two accounts for non-medical people, and both are from the same nationality as the participants. Finally, Group 3) Different Nationality: as we addressed in H2 source_receivers being similar in nationality is predicted to have a significant positive influence on perceived information adoption. Based on this hypothesis and in order to make a comparison with group 1 (the same nationality accounts), we designed two accounts for non-Saudi people, and both have a medical expertise. In total,

we produced 6 samples of vignettes (6 profiles). The questionnaire was designed in such a way that only two sets of profiles will be shown to each respondent. Vignettes of Group 1 were presented to all participants while those of Groups 2 & 3 were manipulated. For instance, groups 1 and 2 of vignettes were presented to participant A, whereas groups 1 and 3 of vignettes were presented to participant B. Figure 1 shows illustrative structure for the designed vignettes and a vignette sample (A):

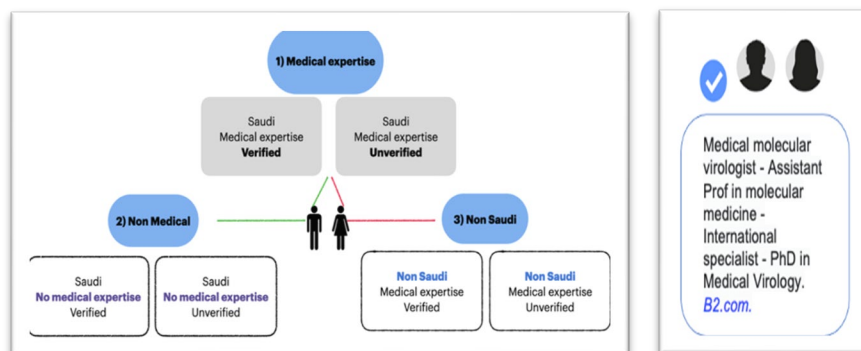


Figure1: Structure for the designed vignettes (6 profiles) & vignette sample.

To measure information adoption of the designed profiles, researchers used two dimensions: use and trust (e.g., Chen, Chua & Deng, 2018; Sussman & Siegal, 2003). The word use refers to “the action of using something or the state of being used for a purpose” (Stevenson, 2010, p. 612). Whereas trust is defined as “confidence in or reliance on some quality or attribute of a person or thing, or the truth in a statement” (Ibrahim et al., 2010, p.269). So we formulated two questions to examine information adoption: 1) how likely are you to trust the information provided by this source? and 2) how likely are you to use the information provided by this source? Then a scale of 5- points from 1) very likely – 5) very unlikely by (Martin et al., 2016; Goldsmith & Horowitz, 2006) was utilised to measure information trust and use. For the 1st experiment of (group1), we have 8 items as we used variables as (verified/ unverified), (same gender/ different gender) for the whole experiments. For the 2nd and 3rd experiments of (group 2 & 3), we have 4 items, as we combined the different gender source with a verified account and same gender source with an unverified account. An example of the asked items under vignettes is “if the account A belongs to a Saudi doctor/ he has same gender as you, how likely are you to trust the provided information from this source?”.

4. Findings

This study utilised an online questionnaire to examine people's attitudes towards using social media as health information source among Saudi users of social media. The questionnaire was filled out by 397 participants with 50.38% of males and 49.62% of females. For age groups of the participants: 18-24= (28%), 25-34 = (34%), 35-44 = (27%), 45-54 = (7%), 55-64 = (3%) and 65+ = (.25%). For education background: 52% of the participants have a bachelor's degree, 26% of the participants have a postgraduate degree, and 19% of the participants have a secondary school education. Although the researcher utilised multiple social media platforms to reach participants with as diverse demographic characteristics as possible, the majority of responders were from young and adult age groups (18-44). This may suggest that the questionnaire was reached by younger and adult individuals. This could be related to the fact that Saudis aged 18 to 44 use social media platforms more frequently than those aged 55+. According to We Are Social statistics (June 2021), 88% of social media users in Saudi Arabia are between the age 18-44, namely 21% of the 18-24 age group, 51% of the 25-34 age group, 16% of the 35-44 age group and only around 8% of the 45+ age group. Findings also showed that there is a high use of social media platforms among the study sample. For the period of using social media platforms, a majority of the respondents, around 96%, stated that they have used social media platforms for more than two years, only 2.8% of respondents stated that they have used social media platforms between a year and two years. Google and social media platforms were found to be the most used sources of health information among participants. Findings also revealed that timeliness, completeness, relevance and accuracy of information were found to be influential on attitudes toward adopting social media information.

4.1 Data analysis

4.1.1 Reliability

To measure the reliability of 5-point Likert scale questions, Cronbach's Alpha was used. The values of Cronbach's Alpha in Table 1 show that there is an acceptable degree of reliability of study dimensions (information quality, information adoption of experiment 1, 2 & 3) where Cronbach's Alpha > 0.6.

Table 1: Cronbach's Alpha for Reliability

Dimensions	Number of Items	Cronbach's Alpha
Information quality	6	0.600
Information adoption of (Experiment of group 1)	8	0.869
Information adoption of (Experiment of group 2)	4	0.839
Information adoption of (Experiment of group 3)	4	0.848

4.1.2 Mann-Whitney test for measuring information adoption for experiments

In the vignettes, we want to understand what factors influence people's attitudes towards adopting social media information. The Mann-Whitney test was used to test the hypotheses and check the differences between groups.

Table 2: Mann-Whitney test for measuring information adoption

Group		N	Mean Rank	Sum of Ranks	z	p-value
Information adoption * Verification	Unverified	397	346.35	137499.50	-6.302	0.0001
	Verified	397	448.65	178115.50		
Information adoption * Medical expertise	No Medical	182	229.23	41949.50	-6.006	0.0001
	Medical	397	318.74	126540.50		
Information adoption * Nationality	Non-Saudi	215	276.84	59520.00	-3.073	0.002
	Saudi	397	322.56	128058.00		

According to table 2, there is a significant difference in information adoption according to the verification feature where $p\text{-value} < 0.05$. The mean rank for verified accounts (448.65) is higher the mean rank for unverified accounts (346.35). There is a significant difference in information adoption according to the medical expertise where $p\text{-value} < 0.05$. The mean rank for medical accounts (318.74) is higher the mean rank for non-medical accounts (229.23). Finally, there is a significant difference in information adoption according to the nationality, where $p\text{-value} < 0.05$. The mean rank for Saudi accounts (322.56) is higher the mean rank for non-Saudi accounts (276.84).

4.1.3 Effects of demographic characteristics of the participants on information adoption

To measure the influence of demographic factors on information adoption, the Mann-Whitney test and Kruskal Wallis test were performed. The findings as seen in Tables 3, 4, 5 & 6 show that only gender has a significant influence on adopting information from verified and same gender accounts where ($p\text{-value} < 0.05$). Specifically, female participants were found to be more likely to adopt information from verified accounts and same gender source compared to males. For other demographic characteristics (age, education & use frequency of social media), no significant differences between demographic groups were found.

Table 3 & 4: Mann-Whitney results for gender & age

Information Adoption	Gender	N	Mean Rank	Mann-Whitney	P-value	Adoption	Age	N	Mean Rank	Mann-Whitney	P-value
Information adoption * Verification feature	Male	200	182.66	-2.87	0.004	Information adoption * verification	18-34 years	246	200.63	-0.362	0.717
	Female	197	215.59				35 and more	151	196.35		
	Total	397					Total	397			
Information adoption * Medical expertise	Male	200	192.72	-1.1	0.26	Information adoption * Medical expertise	18-34 years	246	198.82	-0.04	0.968
	Female	197	205.37				35 and more	151	199.29		
	Total	397					Total	397			
Information adoption * Same gender	Male	200	186.23	-2.243	0.025	Information adoption * Same gender	18-34 years	246	204.08	-1.129	0.259
	Female	197	211.97				35 and more	151	190.73		
	Total	397					Total	397			
Information adoption * Same nationality	Male	200	192.72	-1.1	0.269	Information adoption * Same nationality	18-34 years	246	198.82	-0.04	0.968
	Female	197	205.37				35 and more	151	199.29		
	Total	397					Total	397			

Table 5 & 6: Kruskal Wallis results for education and frequency of use

Information Adoption	Education	N	Mean Rank	Kruskal - Wallis	p-value	Information Adoption	How often do you use social media?	N	Mean Rank	Kruskal - Wallis	p-value
Information adoption *Verification	Primary	1	367.00	3.64	0.45	Information adoption *Verification	Several Times a day	378	201.26	3.9	0.63
	Intermediate	6	185.17				Once A Day	10	156.75		
	Secondary	77	189.54				3-5 Times/week	4	187.00		
	Bachelor	208	197.04				Every few weeks	2	144.25		
	Postgraduate	105	209.01				Less often	1	97.00		
	Total	397					Other	2	112.25		
Information adoption * Medical expertise	Primary	1	386.00	8.58	0.07	Information adoption * Medical expertise	Total	397		2.6	0.75
	Intermediate	6	128.83				Several Times a day	378	200.95		
	Secondary	77	177.54				Once A Day	10	153.70		
	Bachelor	208	205.68				3-5 Times/week	4	186.13		
	Postgraduate	105	203.73				Every few weeks	2	160.25		
	Total	397					Less often	1	171.00		
Information adoption * Same gender	Primary	1	389.00	3.16	0.53	Information adoption * Same gender	Other	2	136.00	3.5	0.55
	Intermediate	6	188.67				Total	397			
	Secondary	77	192.06				Several Times a day	378	200.87		
	Bachelor	208	199.51				Once A Day	10	165.20		
	Postgraduate	105	201.86				3-5 Times/week	4	177.13		
	Total	397					Every few weeks	2	158.50		
Information adoption * Same nationality	Primary	1	386.00	8.58	0.07	Information adoption * Same nationality	Less often	1	229.50	2.6	0.75
	Intermediate	6	128.83				Other	2	84.50		
	Secondary	77	177.54				Total	397			
	Bachelor	208	205.68				Several Times a day	378	200.95		
	Postgraduate	105	203.73				Once A Day	10	153.70		
	Total	397					3-5 Times/week	4	186.13		

5. Discussion and Conclusion

This study aims to examine factors influencing health information adoption from social media platforms among Saudi users. The findings revealed that there is an established use of social media platforms as a health information source. The novel vignette design allowed us to measure participants' perceptions of information sources with different characteristics. For all the users, it was found that the verification mark and receiving information from a source with medical expertise had a significant influence on user adoption of the social media health information, and similarity in nationality and gender also positively influenced participants' attitudes towards adopting health information. Furthermore, adoption of social media information was found to be affected by characteristics of information quality such as timeliness, completeness, relevance, and accuracy. For the female participants, the positive influence of verification mark and same gender source were stronger than for male participants, suggesting there may be differences in the information seeking behaviour of male and female information seekers in Saudi Arabia.

Although we had expected that the source expertise would positively impact attitudes towards adopting information, the response to the verification mark in the Group 2 results, without medical expertise, was also very strong. Gender also affected the response to verification mark. However, the survey results did not provide any data that could explain these phenomena. Therefore, a second phase of the study is currently underway in which selected participants of both genders have been interviewed. This may help to gain a deeper understanding of the rationale underlying their information seeking behaviours and which other sources they use to find medical information.

We believe that our study findings provide helpful insights to health organisations regarding utilising social media platforms to convey health information to the Saudi population. For example, female experts with verified accounts are likely to be the best sources for providing health messages to Saudi females.

This work makes a practical contribution to the study of social media usage in middle east countries which have been under researched compared to western countries. Future work should include comparative studies of social media usage across different cultures. Furthermore, a methodological contribution could be provided to the literature regarding using vignettes experiment design. We found that vignettes are a valuable tool as they enabled us to combine and manipulate different variables, such as source expertise and nationality with verification mark. Consequently, the approach is recommended for future research that aims to manipulate variables or examine individuals' attitudes towards different characteristics or situations in which social media is used.

References

- Allington, D., Duffy, B., Wessely, S., Dhavan, N. and Rubin, J. (2021) Health-protective behaviour, social media usage and conspiracy belief during the COVID-19 public health emergency. *Psychological medicine*, Vol 51, No.10, pp 1763-1769.

- AlMansour, A.A. and Iliopoulos, C.S. (2015) August. Using Arabic microblogs features in determining credibility. In Proceedings of the 2015 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining 2015, pp 1212-1219.
- Atzmüller, C. and Steiner, P.M. (2010) Experimental vignette studies in survey research. *Methodology: European Journal of Research Methods for the Behavioural and Social Sciences*, Vol 6, No. 3, pp 128.
- Bracamonte, V., and Okada, H. (2015) Impact of nationality information in feedback on trust in a foreign online store. *Journal of socio-informatics*, Vol 8, No. 1, pp 1-12.
- Central Intelligence Agency. (2020) The World Factbook: Middle East: Saudi Arabia. [Online], Retrieved from: <https://www.cia.gov/library/publications/the-world-factbook/geos/sa.html> [Accessed 29 June 2020]
- Chen, X., Chua, A. and Deng, S. (2018) Comparing the web and mobile platforms of a social Q&A service from the user's perspective. *Aslib Journal of Information Management*, Vol 70, No. 2, pp 176-191.
- Erkan, I. and Evans, C. (2016) The influence of eWOM in social media on consumers' purchase intentions: An extended approach to information adoption. *Computers in Human Behaviour*, Vol 61, pp 47-55.
- Evans, S., Roberts, M., Keeley, J., Blossom, J., Amaro, C., Garcia, A., Stough, C., Canter, K., Robles, R. and Reed, G. (2015) Vignette methodologies for studying clinicians' decision-making: validity, utility, and application in ICD-11 field studies. *International Journal of Clinical and Health Psychology*, Vol 15, No. 2, pp 160-170.
- Filieri, R., Hofacker, C. F., & Alguezau, S. (2018) What makes information in online consumer reviews diagnostic over time? The role of review relevancy, factuality, currency, source credibility and ranking score. *Computers in Human Behaviour*, Vol 80, pp 122-131.
- Goldsmith, R.E. and Horowitz, D. (2006) Measuring motivations for online opinion seeking. *Journal of Interactive Advertising*, Vol 6, No. 2, pp 2-14.
- Granjon, V., & Benedic, R. (2017). Instagram's Social Media Influencers: A study of Online Popularity from Source credibility to brand attitude (Dissertation). Retrieved from <http://urn.kb.se/resolve?urn=urn:nbn:se:uu:diva-328627>
- Hirvonen, N., Tirroniemi, A., and Kortelainen, T. (2018) The cognitive authority of user-generated health information in an online forum for girls and young women. *Journal of Documentation*, Vol 75, No. 1, pp 78-98.
- Hou, W.K., Liang, L., Hougen, C. and Bonanno, G.A. (2021) Regulatory flexibility of sustaining daily routines and mental health in adaptation to financial strain: A vignette approach. *International Journal of Environmental Research and Public Health*, Vol 18, No. 6, 3103.
- Hsu, Y.H., Li, C.K., Li, C.M. and Liu, N.T. (2016) The effect of website quality features and cognitive absorption on social network site usage: A cross-national study. *International Journal of Electronic Commerce Studies*, Vol 7, No. 2, pp 156-188.
- Hussain, S., Guangju, W., Jafar, R.M.S., Ilyas, Z., Mustafa, G. and Jianzhou, Y. (2018) Consumers' online information adoption behavior: Motives and antecedents of electronic word of mouth communications. *Computers in Human Behaviour*, Vol 80, pp 22-32.
- Ibrahim, E.N.M., Hamzah, W.N.I.I.W., Taslim, J. and Adnan, W.A.W. (2010) Evaluating trust elements in the context of Islamic based informational websites. In 2010 IEEE International Conference on User Science and Engineering (i-USER), pp 268-272.
- Martin, M.J., Hill, R.L., Van Sandt, A. and Thilmany, D.D. (2016) Colorado residents trusted sources of agricultural, biotechnology, and food information. *AgBioForum*, Vol 19, No. 1, pp 34-43.
- Rieh S., Bates M. and Maack M. (2010) *Credibility and cognitive authority of information* 3rd ed. Taylor and Francis Group, LLC New York: *Encyclopaedia of Library and Information Sciences*, pp 1337 – 1344
- Saunders, M., Lewis, P. and Thornhill, A. (2009) *Research methods for business students*, Pearson education, London
- Sbaffi, L. and Rowley, J. (2017) Trust and credibility in web-based health information: a review and agenda for future research. *Journal of Medical Internet Research*, Vol 19, No. 6, e7579.
- Shamhuyenhazva, R., Van Tonder, E., Roberts-Lombard, M., and Hemsworth, D. (2016) Factors influencing Generation Y consumers' perceptions of eWOM credibility: a study of the fast-food industry. *The International Review of Retail, Distribution and Consumer Research*, Vol 26, No. 4, pp 435-455.
- Steffes, E. and Burgee, L. (2009) Social ties and online word of mouth. *Internet Research*, Vol 19, No. 1, pp 42-59.
- Stevenson, A. ed., (2010) *Oxford Dictionary of English*, Oxford University Press, USA.
- Sulaiman, K., Adeyemi, I. and Ayegun, I. (2020) Information sharing and evaluation as determinants of spread of fake news on social media among Nigerian youths: Experience from COVID-19 pandemic. *International Journal of Knowledge Content Development & Technology*, Vol 10, No. 4, pp 65-82.
- Sussman, S. W., and Siegal, W. S. (2003) Informational influence in organizations: An integrated approach to knowledge adoption. *Information Systems Research*, Vol 14, No. 1, pp 47-65.
- Syn, S. Y., and Kim, S. U. (2013) The impact of source credibility on young adults Health information activities on facebook: Preliminary findings. *Proceedings of the American Society for Information Science and Technology*, Vol 50, No. 1, pp 1-4.
- Verma, N., Fleischmann, K.R. and Koltai, K.S. (2018) Demographic factors and trust in different news sources. *Proceedings of the Association for Information Science and Technology*, Vol 55, No. 1, pp 524-533.
- Watts, S.A. and Zhang, W., 2008. Capitalizing on content: Information adoption in two online communities. *Journal of the association for information systems*, Vol 9, No. 2, p.3.

- Wixom, B.H. and Todd, P.A. (2005) A theoretical integration of user satisfaction and technology acceptance. *Information systems research*, Vol 16, No. 1, pp 85-102.
- Yin, C., Sun, Y., Fang, Y. and Lim, K. (2018) Exploring the dual-role of cognitive heuristics and the moderating effect of gender in microblog information credibility evaluation. *Information Technology & People*, Vol 31, No. 3, pp 741-769.

Resale HDB Price Prediction Considering Covid-19 through Sentiment Analysis

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Abstract: Twitter sentiment has been used as a predictor to predict price values or trends in both the stock market and housing market. The pioneering works in this stream of research drew upon works in behavioural economics to show that sentiment or emotions impact economic decisions. Latest works in this stream focus on the algorithm used as opposed to the data used. A literature review of works in this stream through the lens of data used shows that there is a paucity of work that considers the impact of sentiments caused due to an external factor on either the stock or the housing market. This is despite an abundance of works in behavioural economics that show that sentiment or emotions caused due to an external factor impact economic decisions. To address this gap, this research studies the impact of Twitter sentiment pertaining to the Covid-19 pandemic on resale Housing Development Board (HDB) apartment prices in Singapore. It leverages SNSCRAPE to collect tweets pertaining to Covid-19 for sentiment analysis, lexicon-based tool, VADER, is used for sentiment analysis, Granger Causality is used to examine the relationship between Covid-19 cases and the sentiment score, and neural networks are leveraged as prediction models. Twitter sentiment pertaining to Covid-19 as a predictor of HDB price in Singapore is studied in comparison with the traditional predictors of housing prices i.e., the structural and neighbourhood characteristics. The results indicate that using Twitter sentiment pertaining to Covid-19 leads to better prediction than using only the traditional predictors and performs better as a predictor compared to two of the traditional predictors. Hence, Twitter sentiment pertaining to an external factor should be considered as important as traditional predictors. In a micro sense, this paper demonstrates the use of sentiment analysis of Twitter data in urban economics. In a macro sense, the paper demonstrates the extent to which social media is able to capture the behavioral economic cues of a population.

Keywords: Sentiment Analysis, Covid-19, Housing Price Prediction, Tweets, Social Media, Singapore HDB, Economics, Neural Networks

1. Introduction

Homeownership is a very important aspect of economic well-being (Seiler et al. 2020). As over 80% of Singaporeans live in Housing Development Board (HDB) apartments (Joo & Wong 2008), their prices are a matter of national importance. The prices of new HDB apartments are determined by the government and the prices of resale HDB apartments are determined by the market (Phang & Wong 1997).

The Covid-19 virus was first detected in December 2019, and by September 2020, all the major economies of the world had hit a recession (Ryan 2020). Singapore was not an exception, and by April 2020, life had changed significantly for all its residents (Lim et al. 2021).

Sentiment analysis is a process of identifying subjective information in a text using the techniques of natural language processing (Wang et al. 2020). Tools such as VADER (Hutto & Gilbert 2014) can be used to identify the sentiment in social media text data resulting in a sentiment score.

Twitter, according to Wojcik & Hughes (2019), is the “modern public square where many voices discuss, debate and share their views”. Since Covid-19 affects not only daily life but also a country’s economy, it is possible to quantify the sentiment of the public during Covid-19 and study its impact on public economic decisions.

A plethora of literature has used Twitter sentiment to predict price values or study price trends both in the stock market (Bollen & Mao 2011) and in the housing market (Velthorst & Güven 2019). However, very little work considers the influence of Twitter sentiment pertaining to an external factor such as Covid-19 on housing prices. Therefore, this research examines the influence of Covid-19 on HDB apartment resale prices in Singapore.

The focus of the studies that used Twitter sentiments to predict price values or study price trends was on the algorithm used as opposed to the data that was collected. However, the results of a model are highly

dependent on the data that is given to it (Redman 2018). Therefore, an examination of the data gathering methods used is important.

This research leverages tweets collected during Covid-19 for sentiment analysis to compare the performance of sentiment of Covid-19 of HDB apartment resale prices in Singapore vis-à-vis other traditional factors.

The following are the contributions of this paper:

1. This paper has performed a survey on literature that used social media data to predict price values or study price trends through the lens of the data used and has made a classification of such literature.
2. It has discovered that there has been little work that considered the influence of sentiments pertaining to an external factor such as Covid-19 on housing prices.
3. To address this gap, it has examined the influence of Covid-19 on HDB apartment resale prices in Singapore through Twitter sentiment, compared with that of other predictors: the structural and neighborhood characteristics of the apartments.
4. The result of this research demonstrates that Twitter sentiments pertaining to Covid-19 is an important source of information for prediction of housing prices compared with the other traditional predictors during the pandemic.
5. To the best of our knowledge, this paper is the first research pertaining to housing prices and Covid-19 in Singapore.

The rest of the paper is organized as follows: Section II is the literature survey, Section III describes the data collection, Section IV examines the relationship between Covid-19 cases and sentiment pertaining to Covid-19, Section V examines the performance of the sentiment as a predictor of HDB resale prices and Section VI provides the conclusion, limitations, and future works.

2. Literature Survey

Humans are not entirely rational in their decision making and emotions, during the time of decision making, play an important part in economic decisions (Nofsinger 2005). Literature shows that stock market prices are impacted by sentiments caused by various external factors such as temperature on the day of trading (Cao & Wei 2005) and results in sports (Edmans et al. 2007). However, these works were unable to quantify public sentiment pertaining to the respective phenomenon or event and had to use a proxy known as a “mood variable” (Edmans et al. 2007). For example, Hirshleifer & Shumway (2003) had to use cloud cover on the day of trading at the location of the stock exchange as the mood variable. However, this method cannot be used universally because while more sunshine may have a positive effect on sentiment in New York, the reverse may be true in Singapore. Using sentiment analysis on Twitter data, the quantification of the sentiment of the public toward an event or phenomenon and the subsequent study of their impact on public economic decisions is possible. Bollen & Mao (2011) was the first to do so, in which Twitter sentiment was used to predict stock prices, drawing upon Hirshleifer & Shumway (2003) and Nofsinger (2005) and thus building a bridge between behavioral economics and natural language processing. Since then, there has been no shortage of similar research.

Literature that follows this trend can be classified into three categories based on the criteria used to collect tweets for sentiment analysis:

1. Generic collection
2. Topic-based collection
3. Object-based collection

In generic tweet collection, tweets are collected with no specific criteria except that the tweets express emotions. An example is Bollen & Mao (2011), in which tweets that “contain explicit statements of their author’s mood states” were collected, i.e, the following expressions: “i feel”, “i am feeling”, “i’m feeling”, “i don’t feel”, “i’m”, “I’m”, “I am” and “makes me”. In topic-based tweet collection, keywords pertaining to the topic are used for tweet collection. An example is Ozturk & Ciftci (2014), in which tweets that contain the following were collected: “USD/TRY”, “#USD/TRY”, “Dollar” and “#Dollar.” In object-based tweet collection, keywords pertaining to the object (companies) are used for tweet collection. An example is Ruan et al. (2018), in which tweets were collected that contain the following: “\$AAPL”, “\$FB”, “\$GOOG”, “\$NFLX”, “\$AMZN”, “\$GE”, “\$MSFT” and “\$GILD”.

However, research such as Hirshleifer & Shumway (2003) and Edmans et al. (2007) demonstrate that sentiment caused by external factors impact stock market prices. The works mentioned above do not study the impact of sentiment pertaining to an external factor on the stock market. Ilyas et al. (2020), which used Twitter sentiment pertaining to Brexit to study the impact of Brexit on the FTSE 100 Index, and Kinyua et al. (2021), which used the sentiment of President Trump's tweets to study their impact on the S&P 100 and DJIA indices, are examples of works that do so.

Literature shows that emotions impact house purchasing decisions as well (Jørgensen 2016). Although this was not drawn upon, the same tweet collection methods have been used to predict price values or study price trends in the housing market as well. Tan & Guan (2021), in which tweets were collected within the geographic location of the United States to study their impact on housing prices within the United States and within the geographic location of Manhattan to study their impact on housing prices within Manhattan, is an example of generic tweet collection. Velthorst & Güven (2019), in which tweets containing the Dutch words: "woningmarkt" and "huizenmarkt" (which both mean "housing market") and "huizenprijzen" (which means "housing prices") were collected to predict the market trends in the Dutch housing market, is an example of topic-based tweet collection. Hannum et al. (2019), in which tweets were collected that contain the name of at least one of the 39 districts of Istanbul to study their impact on housing prices within those 39 districts, is an example of object-based tweet collection.

Some studies use sentiment analysis of data from other social media platforms such as Weibo (Deng et al. 2018) and of financial news (Hu et al. 2021) to predict stock market prices and trends. There are also examples of the use of sentiment analysis of Weibo data (Li et al. 2022) and of news articles (Hausler et al. 2018) for predicting housing prices and trends. To the best of our knowledge there has been no study that has used sentiment analysis of social media data pertaining to an external factor such as Covid-19 to predict price values or study price trends in the housing market.

The Covid-19 pandemic has impacted the housing market across the world (Yiu 2021). It is possible to use Twitter data and sentiment analysis to quantify the public sentiment towards Covid-19 (Ridhwan & Hargreaves 2021). Subsequently, it is possible to study the impact of this sentiment on resale HDB prices in Singapore. To the best of our knowledge, there has been no study on the impact of Covid-19 on the housing market in Singapore.

3. Data Collection

3.1 HDB Data

The HDB resale data and the HDB resale price index data are taken from data.gov.sg and are filtered for the following dates: January 2018 to February 2022, which includes the peak period of the Covid-19 pandemic in Singapore. The resale price is deflated to Quarter I of 2018. Block and street names are combined to form the address and age is calculated from the lease commencement date. The list of primary schools is taken from moe.gov.sg; the list of MRT stations is taken from mrtmapsingapore.com; the list of bus interchanges is taken from landtransportguru.net; and the list of hawker centres is taken from sgclean.gov.sg with their addresses being taken from streetdirectory.com. Using the addresses and OneMapAPI (One Map API 2018), the longitude and latitude are calculated. The following are calculated for each apartment: Proximity to the Nearest Primary School, Proximity to the Nearest MRT Station, Proximity to the Nearest Bus Interchange, Proximity to the Central Business District (CBD) and Proximity to the Nearest Hawker Centre, using the GeoPy library (Esmukov 2021). The total number of instances in the dataset is 100,506.

This dataset is further divided into Pre-Covid, dating from January 2018 to December 2019, the period before the Covid-19 pandemic, and Covid, dating from May 2020 to February 2022, which falls within the peak period of the pandemic. The number of instances in the Pre-Covid dataset and in the Covid dataset are 43,743 and 50,830, respectively.

3.2 Twitter Data

Tweets were collected using the Python library SNSCRAPE (Snsrape 2022) for the dates: from 15th February 2020 to 15th February 2021 pertaining to the location: Singapore, language: English and using keywords such as: 'coronavirus', 'nCoV2019', '2019nCoV', 'COVID', 'SARS-COV-2', 'circuit breaker', 'Covid-19' as was done in

Ridhwan & Hargreaves (2021). Duplicated tweets were removed based on Tweet ID, @ mentions, retweet symbols, hyperlinks and special characters were removed.

Then sentiment scores were calculated for each tweet using VADER (Hutto & Gilbert 2014). Based on the sentiment scores, daily average sentiment scores were calculated.

3.3 Daily Covid-19 Cases Data

The daily Covid-19 case data from February 15th, 2020, to February 15th, 2022, was collected from moh.gov.sg.

4. Relationship Analysis: Covid-19 Cases and Covid-19 Sentiment

4.1 Adjusted VADER

Covid-19 has been a very negative experience in Singapore and has caused panic among the public (Ho et al. 2020). But the number of positive tweets pertaining to Covid-19 calculated using VADER far exceeds that of negative tweets as shown in Fig.1, which is in line with the results of Ridhwan & Hargreaves (2021). This could be because VADER being a lexicon-based sentiment analysis tool (Hutto & Gilbert 2014), is limited by its lexicon (Kannan et al. 2016) and is unable to handle neologisms.

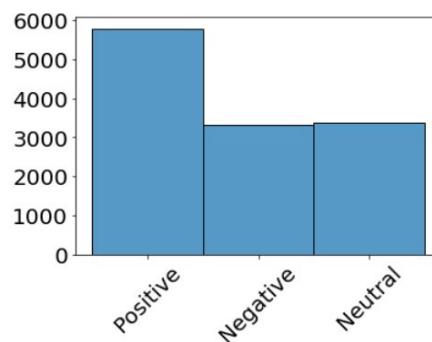


Figure 1: Histogram of Tweets – VADER

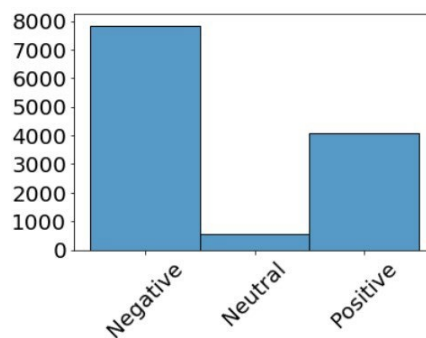


Figure 2: Histogram of Tweets - Adjusted VADER

Based on the keywords used for tweet collection, words and sentiment scores were added to VADER's lexicon. pertaining to Covid-19 such as : 'coronavirus', '2019nCoV', 'COVID -1', 'SARS-COV-2', 'circuit breaker', 'Covid-19', 'Covid19', 'covid', 'cases', 'circuitbreaker', 'stayhome', 'death and 'deaths' were considered negative, words that ameliorated the situation such as: 'vaccine' and 'vaccines' were considered positive and due to the negative im plications and ubiquity of the phrase 'Covid positive' the word 'positive' was considered neutral. This is called the Adjusted VADER. Then sentiment scores were calculated again for each tweet using this Adjusted VADER. Fig.2 shows that negative tweets exceed positive tweets as it is befitting of tweets pertaining to Covid-19

Table 1: Granger Causality - Cases on Adjusted VADER Sentiment

Lags	SSR based F Test	P - value	SSR based Chi2 Test	P - value
1	42.515	0.0000	42.690	0.0000
2	17.805	0.0000	35.855	0.0000
3	11.244	0.0000	34.060	0.0000
4	6.976	0.0000	28.253	0.0000
5	5.047	0.0001	25.625	0.0001
6	4.335	0.0003	26.487	0.0002

Table 2: Granger Causality - Adjusted VADER Sentiment on Cases

Lags	SSR based F Test	P - value	SSR based Chi2 Test	P - value
1	0.061	0.8056	0.061	0.8052
2	0.198	0.8207	0.398	0.8195
3	0.339	0.7969	1.028	0.7945
4	0.529	0.7143	2.144	0.7094
5	0.899	0.4811	4.565	0.4712
6	0.792	0.5760	4.841	0.5643

Table 3: Results of Model 1

Characteristics	F - statistic	P - value
Flat Type	535.43	0
Storey Range	528.46	0
Flat Model	1056.68	0
Floor Area	530.42	0
Age	13158.179	0
Proximity to Nearest Bus Interchange (Bus Interchange)	779.58	0
Proximity to Nearest MRT Station (MRT)	246.32	0
Proximity to Central Business District (CBD)	142.33	0
Proximity to Nearest Primary School (Primary School)	17.22	0
Proximity to Nearest Hawker Centre (Hawker Centre)	18.70	0

4.2 Granger Causality

Subsequently, daily average sentiment scores were calculated. As indicated by Table 1 and Table 2, at a 5% significance level, the daily Covid-19 case number Granger Causes the daily average Covid-19 sentiment score calculated using the Adjusted VADER, but the reverse is not true.

5. Performance Analysis and Discussion: Covid-19 Sentiment as a Predictor for HDB Resale Prices

5.1 Hedonic Price Model

Using the Hedonic Price Model, the price function of housing can be represented as follows: $P = f(S, N)$ where S is the structural characteristics of the house and N is the neighborhood characteristics (Rosen 1974). According to the Monocentric City Model, most business activity occurs around a single point i.e, the CBD. Therefore, housing prices decrease with distance from the CBD (Alonso 1964). HDB resale apartment prices in Singapore are influenced by the following structural characteristics: Floor Area, Apartment Type, Apartment Model, Apartment Age, Apartment Storey and the following neighborhood characteristics: Proximity to the CBD, Proximity to the Nearest Bus Interchange, Proximity to the Nearest MRT Station,

Proximity to the Nearest Hawker Centre and Proximity to the Nearest Primary School (Yuen 2005) (Belcher & Chisholm 2018).

$$\text{Price}_{it} = \alpha_i + \beta_1 \text{type}_i + \beta_2 \text{storey}_i + \beta_3 \text{area}_i + \beta_4 \text{apartmentmodel}_i + \beta_5 \text{age}_{it} + \beta_6 \text{interchange}_i + \beta_7 \text{MRT}_i + \beta_8 \text{CBD}_i + \beta_9 \text{school}_i + \beta_{10} \text{hawker}_i + \beta_{11} \text{dummy}_{\text{quarterly}} + \beta_{12} \text{dummy}_{\text{town}} + \epsilon_{it} \quad (1)$$

To confirm this, Model (1) is fit on the Pre-Covid dataset, whose results are shown in Table 3. At a 5% significance level, all the characteristics listed above influence the resale HDB apartment prices in Singapore ($R^2 = 0.848$).

Further, each of the characteristics is individually used as a predictor of resale HDB apartment prices. The training set and test set (test-train split = 0.25: 0.75), which are both taken from the Pre Covid dataset, are kept the same across the predictors. The prediction is carried out using neural networks of four hidden layers, using two different activation functions: Rectified Linear Unit (ReLU) and Scaled Exponential Linear Unit (SELU). The neural networks are built using the library Keras (Chollet 2015), and each network is trained across 1000 epochs with early stoppage whose results are shown in Fig.3 and Fig.4. The results show that the structural characteristics are better predictors of resale HDB apartment prices than the neighborhood characteristics.

1dummyquarterly captures the time variant effects on apartment prices and dummytown captures the effect on apartment prices that varies from one residential town in Singapore to as was done in Belcher & Chisholm (2018).

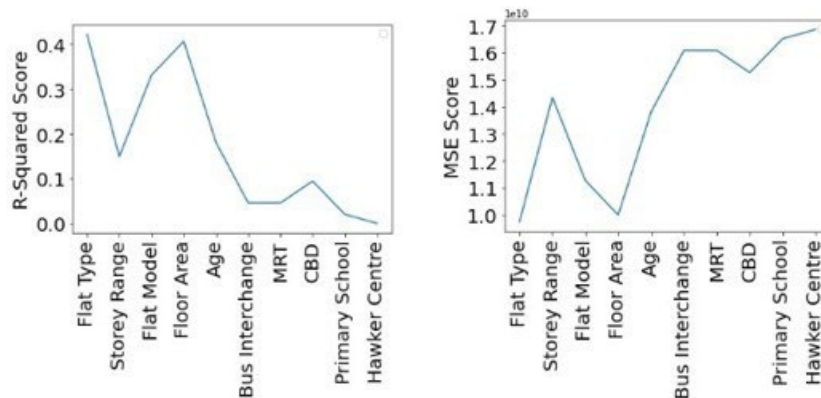


Figure 3: Prediction of Pre Covid HDB Prices using SELU Activation

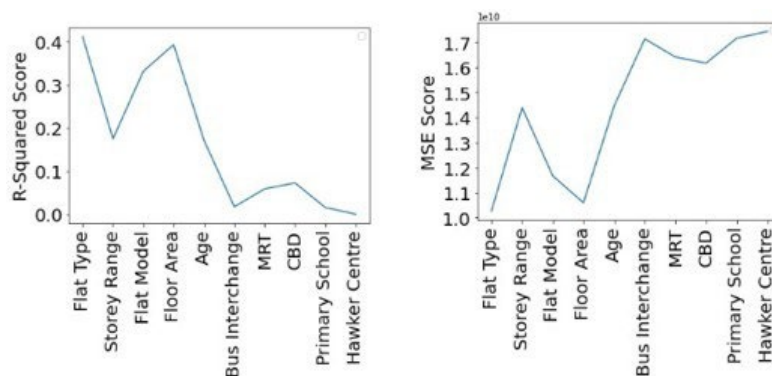


Figure 4: Prediction of Pre Covid HDB Prices using ReLU Activation

5.2 Covid-19 Sentiment as a predictor of HDB resale Prices

As the statistical significance of the traditional characteristics of housing that determine housing prices i.e., the structural and neighbourhood characteristics has been confirmed, their performance as predictors of HDB resale prices can be compared to that of Twitter sentiment pertaining to Covid-19.

The average time taken for housing purchase decisions in Israel was about 8.2 weeks in 2010 (Genesove & Han 2012), its local population in 2010 was 7.6236 million (Population, Total-Israel 2021), and that of Singapore in 2018 was 3.9942 million (Population trends 2018 2018). As the number of houses in a country is a function of the population of the country (Mulder 2006), it can be said that the time taken for housing purchase decisions depends on the population. Therefore, the estimated average time taken for housing purchase decisions in Singapore is about 4.3 weeks, or approximately a month. Hence, the monthly average Covid-19 sentiment score calculated using the Adjusted VADER is chosen as a predictor.

Before prediction, Model (2) is fit on the Covid dataset, whose results are shown in Table 4. At a 5% significance level, the monthly average Covid-19 sentiment score calculated using the Adjusted VADER is statistically significant even though two traditional neighbourhood characteristics: Proximity to Nearest Primary School and Proximity to Nearest Hawker Centre are not ($R^2 = 0.902$).

$$\text{Price}_{it} = \alpha_i + \beta_1 \text{type}_i + \beta_2 \text{storey}_i + \beta_3 \text{area}_i + \beta_4 \text{apartmentmodel}_i + \beta_5 \text{age}_{it} + \beta_6 \text{interchange}_i + \beta_7 \text{MRT}_i + \beta_8 \text{CBD}_i + \beta_9 \text{school}_i + \beta_{10} \text{hawker}_i + \beta_{11} \text{sentiment}_t + \beta_{12} \text{dummy}_{\text{quarterly}} + \beta_{13} \text{dummy}_{\text{town}} + \epsilon_{it} \quad (2)$$

The monthly average Covid-19 sentiment score's performance as a predictor of resale HDB apartment prices is compared with that of the structural and neighborhood characteristics listed above. This was done on Covid dataset using the same approach as was done for the Pre Covid dataset, using the same test-train split (0.25–0.75), whose results are shown in Fig.5 and Fig.6.

Furthermore, using the same training and test set, the R-squared of a combined predictor which uses the traditional structural and neighbourhood characteristics, and the monthly average Covid-19 sentiment score is

Table 4: Results of Model 2

Characteristics	F - statistic	P - value
Flat Type	67.073	0
Storey Range	582.523	0
Flat Model	461.486	0
Floor Area	4806.183	0
Age	24522.495	0
Bus Interchange	712.039	0
MRT	237.220	0
CBD	150.860	0
Primary School	1.436	0.231
Hawker Centre	0.027	0.870
Monthly Average Covid-19 Sentiment Score (Sentiment)	57.275	0

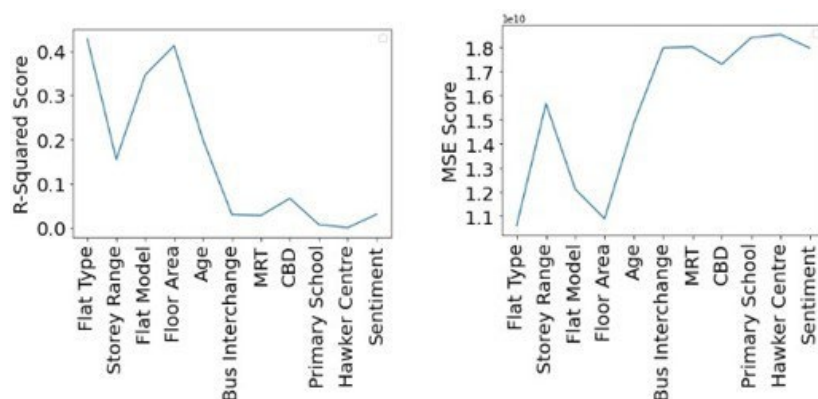


Figure 5: Prediction of Covid HDB Prices using SELU Activation

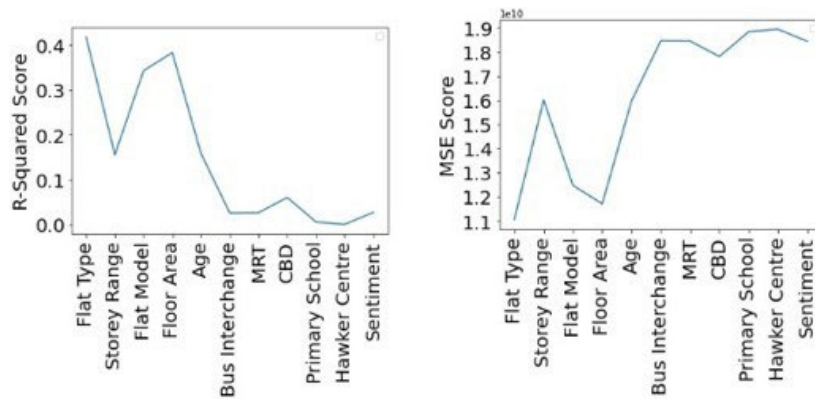


Figure 6: Prediction of Covid HDB Prices using ReLU Activation

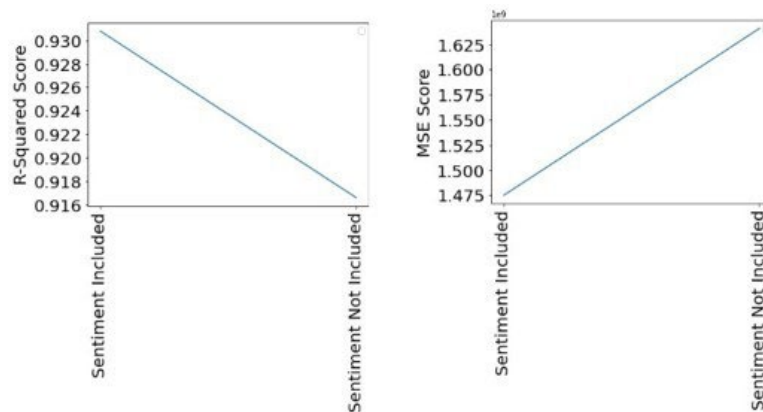


Figure 7: Prediction of Covid HDB Prices using SELU Activation with and without Sentiment

compared to a combined predictor which uses only the traditional structural and neighbourhood characteristics. The results of this comparison are shown in Fig.7 and Fig.8. The results indicate the following:

1. The monthly average Covid-19 sentiment score is a better predictor than the neighbourhood characteristics: Proximity to the Nearest Primary School and Proximity to the Nearest Hawker Centre i.e., higher R- Squared score and lower Mean Squared Error.
2. The combined predictor that uses the monthly average Covid-19 sentiment score performs better than the one that does not i.e., higher R- Squared score and lower Mean Squared Error.

The results indicate that sentiment pertaining to Covid-19 leads to better prediction of housing prices in Singapore during the Covid-19 pandemic than only using traditional predictors. This is notable because it is well established in literature that structural characteristics and neighborhood characteristics influence housing prices (Belcher & Chisholm 2018) (Yuen 2005), but there is no literature precedent for an external factor such as Covid-19 influencing housing prices.

6. Conclusion, Limitations and Future Works

6.1 Conclusion

An examination of the literature that uses sentiment analysis of social media data to either predict price values or study price trends showed that sentiment pertaining to an external factor such as Covid-19 has never been used to predict housing prices. This research addressed this gap and proposed to study the resale HDB apartment price considering Twitter sentiment during the Covid-19 pandemic. It examines the influence of Covid-19 on HDB resale prices in Singapore through Twitter sentiment analysis in comparison with other traditional predictors of housing price: the structural and neighbourhood characteristics. The results show that Twitter sentiment pertaining to Covid- 19 can be an important predictor of HDB resale prices vis-à-vis other traditional predictors. In a micro sense, this paper demonstrates the use of sentiment analysis of Twitter data in urban economics. In a macro sense, the paper demonstrates the extent to which social media

is able to capture the behavioral economic cues of a population. This research draws on works in natural language processing, behavioral economics and urban economics and opens opportunities for future interdisciplinary research.

6.2 Limitations

Although this research provides useful insights and practical insights about the application of twitter sentiment analysis during the Covid-19 pandemic to resale HDB apartment price prediction, it has its limitation in that it has only considered HDB resale prices in Singapore and not private property prices.

6.3 Future Works

Future work could include private property data and compare the impact of the two through the lens of property rights theory. Future works could also examine what exactly does Twitter sentiment pertaining to Covid-19 represents from an economic perspective. Future works could examine how social media sentiment fits into the area of urban economics. Future works could also examine how the impact of this sentiment on housing prices varies through the different phases of the pandemic.

References

- Alonso, W. (1964), *Location and Land Use: Toward a General, East-West Center Press*.
- Belcher, R. N. & Chisholm, R. A. (2018), 'Tropical Vegetation and Residential Property Value: A Hedonic Pricing Analysis in Singapore', *Ecological Economics* 149, 149–159.
- Bollen, J. & Mao, H. (2011), 'Twitter Mood as a Stock Market Predictor', *Computer* 44(10), 91–94.
- Cao, M. & Wei, J. (2005), 'Stock Market Returns: A Note on Temperature Anomaly', *Journal of Banking & Finance* 29(6), 1559–1573.
- Chollet, F. (2015), 'Keras'.
- URL: <https://github.com/fchollet/keras>, 2015
- Deng, Y., Xie, Q. & Wang, Y. (2018), Research on Investor Sentiment and Stock Market Prediction based on Weibo Text, in '2018 International Conference on Security, Pattern Analysis, and Cybernetics (SPAC)', IEEE, pp. 1–5.
- Edmans, A., Garcia, D. & Norli, Ø. (2007), 'Sports Sentiment and Stock Returns', *The Journal of Finance* 62(4), 1967–1998.
- Esmukov, K. (2021), 'Geopy'.
- URL: <https://pypi.org/project/geopy/>.
- Genesove, D. & Han, L. (2012), 'Search and Matching in the Housing Market', *Journal of Urban Economics* 72(1), 31–45.
- Hannum, C., Arslanli, K. Y. & Kalay, A. F. (2019), 'Spatial Analysis of Twitter Sentiment and District-level Housing Prices', *Journal of European Real Estate Research* 12(2), 173–189.
- Hausler, J., Ruschinsky, J. & Lang, M. (2018), 'News-based Sentiment Analysis in Real Estate: a Machine Learning Approach', *Journal of Property Research* 35(4), 344–371.
- Hirshleifer, D. & Shumway, T. (2003), 'Good Day Sunshine: Stock Returns and the Weather', *The Journal of Finance* 58(3), 1009–1032.
- Ho, C. S., Chee, C. Y., Ho, R. C. et al. (2020), 'Mental Health Strategies to Combat the Psychological Impact of Covid-19 beyond Paranoia and Panic', *Ann Acad Med Singapore* 49(1), 1–3.
- Hu, Z., Wang, Z., Ho, S.-B. & Tan, A.-H. (2021), Stock Market Trend Forecasting based on Multiple Textual Features: A Deep Learning Method, in '2021 IEEE 33rd International Conference on Tools with Artificial Intelligence (ICTAI)', IEEE, pp. 1002–1007.
- Hutto, C. & Gilbert, E. (2014), Vader: A Parsimonious Rule-based Model for Sentiment Analysis of Social Media Text, in 'Proceedings of the International AAAI Conference on Web and Social Media', Vol. 8, pp. 216–225.
- Ilyas, S. H. W., Soomro, Z. T., Anwar, A., Shahzad, H. & Yaqub, U. (2020), Analyzing Brexit's Impact using Sentiment Analysis and Topic Modeling on Twitter Discussion, in 'The 21st Annual International Conference on Digital Government Research', pp. 1–6.
- Joo, T. T. K. & Wong, T.-C. (2008), 'Public Housing in Singapore: A Sustainable Housing form and Development', *Spatial Planning for a Sustainable Singapore*, p. 135.
- Jørgensen, C. J. (2016), 'The Space of the Family: Emotions, Economy and Materiality in Homeownership', *Housing, Theory and Society* 33(1), 98–113.
- Kannan, S., Karuppusamy, S., Nedunchezian, A., Venkateshan, P., Wang, P., Bojja, N. & Kejariwa, A. (2016), 'Big Data Analytics for Social Media', *Big Data: Principles and Paradigms*, Cambridge-MA, Morgan Kaufmann-Elsevier pp. 63–94.
- Kinyua, J. D., Mutigwe, C., Cushing, D. J. & Poggi, M. (2021), 'An Analysis of the Impact of President Trump's Tweets on the DJIA and S&P 500 using Machine Learning and Sentiment Analysis', *Journal of Behavioral and Experimental Finance* 29, 100447.

- Li, J., Wang, Y. & Liu, C. (2022), 'Spatial Effect of Market Sentiment on Housing Price: Evidence from Social Media Data in China', *International Journal of Strategic Property Management* 26(1), 72–85.
- Lim, V. W., Lim, R. L., Tan, Y. R., Soh, A. S., Tan, M. X., Othman, N. B., Dickens, S. B., Thein, T.-L., Lwin, M. O., Ong, R. T.-H. et al. (2021), 'Government Trust, Perceptions of Covid-19 and Behaviour Change: Cohort Surveys, Singapore', *Bulletin of the World Health Organization* 99(2), 92.
- Mulder, C. H. (2006), 'Population and Housing: a Two-sided Relationship', *Demographic Research* 15, 401–412. Nofsinger, J. R. (2005), 'Social Mood and Financial Economics', *The Journal of Behavioral Finance* 6(3), 144–160. One Map API (2018).
URL: <https://www.onemap.gov.sg/home/>.
- Ozturk, S. S. & Ciftci, K. (2014), 'A Sentiment Analysis of Twitter Content as a Predictor of Exchange Rate Movements', *Review of Economic Analysis* 6(2), 132–140.
- Phang, S.-Y. & Wong, W.-K. (1997), 'Government Policies and Private Housing Prices in Singapore', *Urban Studies* 34(11), 1819–1829.
- Population, Total-Israel (2021).
URL: <https://data.worldbank.org/indicator/IL>.
- Population Trends 2018 (2018).
URL: <https://www.singstat.gov.sg/-/media/files/publications/population/population2018.pdf>.
- Redman, T. C. (2018), 'If Your Data is Bad, Your Machine Learning Tools are Useless', *Harvard Business Review* 2.
- Ridhwan, K. M. & Hargreaves, C. A. (2021), 'Leveraging Twitter Data to Understand Public Sentiment for the Covid-19 Outbreak in Singapore', *International Journal of Information Management Data Insights* 1(2), 100021.
- Rosen, S. (1974), 'Hedonic Prices and Implicit Markets: Product Differentiation in Pure Competition', *Journal of Political Economy* 82(1), 34–55.
- Ruan, Y., Durrezi, A. & Alfantoukh, L. (2018), 'Using Twitter Trust Network for Stock Market Analysis', *Knowledge- Based Systems* 145, 207–218.
- Ryan, J. M. (2020), Covid-19: Global Pandemic, Societal Responses, Ideological Solutions, in 'COVID-19', Routledge, pp. 1–8.
- Seiler, M. J., Zhang, Y. & Zhao, L. (2020), 'The Effect of Real Estate Ownership on Subjective Well-Being', *Journal of Real Estate Portfolio Management* 25(2), 128–137.
- Snscape (2022).
URL: <https://github.com/JustAnotherArchivist/snscape>
- Tan, M. J. & Guan, C. (2021), 'Are People Happier in Locations of High Property Value? Spatial Temporal Analytics of Activity Frequency, Public Sentiment and Housing Price Using Twitter Data', *Applied Geography* 132, 102474.
- Velthorst, M. & Güven, Ç. (2019), Predicting Housing Market Trends using Twitter Data, in '2019 6th Swiss Conference on Data Science (SDS)', IEEE, pp. 113–118.
- Wang, Z., Ho, S.-B. & Cambria, E. (2020), 'Multi-level Fine-scaled Sentiment Sensing with Ambivalence Handling', *International Journal of Uncertainty, Fuzziness and Knowledge-Based Systems* 28(04), 683–697. Wojcik, S. & Hughes, A. (2019), 'Sizing up Twitter Users', PEW Research Center 24.
- Yiu, C. Y. (2021), 'Why House Prices Increase in the Covid-19 Recession: A Five-country Empirical Study on the Real Interest Rate Hypothesis', *Urban Science* 5(4), 77.
- Yuen, B. (2005), 'Romancing the High-Rise in Singapore', *Cities* 22(1), 3–13.

Factors Influencing eWOM Review Adoption: An Empirical Evidence from Vietnam Tourism Website

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Abstract: Based on the cognition-affection-behaviour model, this study investigates the effects of tie strength, homophily, source trustworthiness, and source expertise on e-WOM credibility (EWC), which in turn affects the attitude toward the product (ATP), the attitude toward the website (ATW), and the adoption of eWOM review (ERA). The study sample includes 527 travellers who purchased a full trip via the Viet travel website. This study used Structural Equation Modelling (SEM) to assess the suggested model, demonstrating a good fit. The findings show that tie strength, homophily, source trustworthiness, and source knowledge all have a substantial and favourable influence on EWC. Furthermore, homophily has a considerable and favourable influence on the source's strength and trustworthiness. The findings also show that EWC has a substantial and favourable influence on ATP, ATW, and ERA. This research adds to the literature by including several viewpoints and aspects from informational and interpersonal drivers. Furthermore, this research argues that these variables influence ERA via EWC and dual mind-sets (ATP and ATW).

Keywords: eWOM Credibility, eWOM Review Adoption, Attitude Toward The Product, Attitude Toward Website, Cognition-Affection-Behaviour Model

1. Introduction

1.1 Background and Rationale

The tourism industry is one of the most important sectors of the global economy and is a major contributor to the Gross Domestic Product of many countries. The success of the tourism industry is largely dependent on the ability of providers to attract and retain customers. In recent years, the emergence of new technologies and the digitization of the tourism industry have changed how businesses market and promote their services.

Given the importance of eWOM in the tourism industry, it is essential to understand the factors that influence consumers' adoption of online reviews and recommendations. eWOM has been found to have a significant impact on consumers' purchase decisions. Therefore, it is important to understand the factors influencing eWOM adoption to develop more effective marketing strategies (Ismagilova et al., 2021).

The focus of this research project is on the Vietnam tourism website. Vietnam is one of the fastest-growing tourism destinations in the world, and it has seen a rapid increase in the number of tourists in recent years. Therefore, it is important to understand the factors influencing eWOM adoption among consumers in this market to promote and market the destination to potential customers effectively.

This research project explores and analyses the factors influencing consumer eWOM review adoption, focusing on the Vietnam tourism website. This research project is important as the results from this research can be used by businesses to understand better the factors influencing eWOM review adoption and how they can leverage these factors to increase customer satisfaction and success. The research project is based on an empirical evidence approach, in which both qualitative and quantitative data will be collected and analyzed. This research project aims to provide a comprehensive understanding of the factors influencing eWOM review adoption and how this phenomenon can be used to improve the effectiveness of marketing strategies in the tourism industry.

1.2 Overview of the Vietnam Tourism Website

The Vietnam Tourism website is interactive and informative, providing tourists with information about the country, its attractions, and the best places to visit. It features a variety of interactive maps, guides, and resources to assist travelers in planning their trips. It also provides information about the country's history,

culture, and customs. The website also provides information about the different types of accommodations and transportation available in the country. Additionally, it provides information about the different activities, attractions, and attractions tourists can enjoy in Vietnam.

The website also has a section devoted to the various festivals and events that occur throughout the year in the country. It includes information about the various music, art, and cultural events in Vietnam. It also provides information about the different activities tourists can participate in while in the country. Additionally, the website provides a directory of restaurants, hotels, and other attractions available in the country. In addition, the website also provides a range of tools and resources to help tourists plan their trip, including a travel planner and a currency converter. It also provides travel tips and advice for tourists planning a trip to Vietnam. Additionally, the website offers information about the different types of visas, visa requirements, and the documents required to access the different attractions and activities in the country.

1.3 The importance of eWOM reviews in the tourism industry

eWOM (electronic word-of-mouth) reviews are a powerful tool for the tourism industry. They are essentially online reviews created by customers who have used the services of a particular company or visited a particular destination. The power of eWOM reviews lies in the fact that they serve as a way of disseminating information on a large scale. They are also considered more credible than traditional marketing materials, as they come from real customers with real experiences. It means that potential customers can get a more accurate view of what they can expect from a particular company or destination before they make a decision.

EWOM reviews have particularly influenced the tourism industry. It is because customers are more likely to trust reviews from other customers who have experienced the same thing rather than trusting marketing claims made by the company itself. It can be particularly important for destinations and companies trying to attract new customers from different countries, as potential customers may not be as familiar with the destination or company as those who have already visited it. eWOM reviews can also provide valuable feedback to a company or destination. It can be used to make improvements and to serve customers in the future better (Williams et al., 2017). Companies can also use eWOM reviews to gauge customer satisfaction and gain insights into customer preferences.

2. Literature review

The cognition-affection-behavior (CAB) paradigm is made up of three parts. Cognition is the production of awareness, viewpoint, acknowledgment, and comprehension of a person's cognitive state towards a specific event via her/his conscience and the acquiring of information, product description comparison, progress of perceptions, insight, and perceived benefits. Affection is a psychological sentiment experienced by a person whenever there is strong relationship among his/her assessment and mental condition (subjectively affection, sensation, or experience) toward a particular event. S/he is driven by good or negative emotions such as like, disliking, loving, or hating this occurrence. After the creation of cognition and attachment for a certain event, conduct is an individual's actual activity or behavioral goal (Mikulincer et al., 2003). The CAB model has been used to look into the connections among both consciousness, emotions and attitudes in social network site (Huang & Sarigöllü, 2014; Lu et al., 2022) as well as to explore customers' behavior from the viewpoint of WOM (Abubakar et al., 2017; Park & Kim, 2008).

Tie Strength indicates that the social structure and the SNSs has an interactive relationship from different perspectives and they depict the strengths of their relationship in the SNSs concept (Lim et al., 2022). There are four basically known components of tie strength which include similarity, familiarity, support and partnership. The interaction of the message that is conveyed through the use of the electronic word of mouth can be sent and received from a weak tie all the way to stronger tie based on the mentioned components. According to (Shan & King, 2015), the tie strength can be described as the intensive interaction and a very close relationship among the tourists and the tourism website users. Tie strength plays a significant and different roles where they help in connecting WOM processes by acting as a network on the perspective for of interpersonal network and is considered as the most important concept for EWC. Through this concepts, the consumers and the customers who in this case are the tourists, are ready and can collect on the different positive comments about the experience on their destinations through the use of SNSs in relation to positive review adoption.

H1: Users' tie strength positively affects EWC

In most cases in their lifetime, people tend to choose and select friends whom they are likely to know very well and are comfortable with. Homophily is in a position to explain a situation where consumers and tourists have similar characteristics as well as the attributes that are to some extent tend to be similar like age, sex or even race (Chu & Kim, 2011). The homophily between the person who is looking for information or basically a researcher, and the source of the information are directly related in a relationship that is influenced by the EWC. The communication between the information seeker and the information sender are likely by high chances to occur and this happens with the individuals who have similar characteristics. Using the SNSs the user or the customer who wants to search for information can choose their desired contacts to which they want to communicate with (Suwandee et al., 2019).

H2: Users' homophily positively affects EWC.

Source of Trustworthiness can be defined as the accessing of information sources to perceive are said to be more authentic and credible where most of the consumers and tourists review that the electronic word of mouth is trustworthy (Verma & Dewani, 2021). However, through this concept, the message senders believe in using the EWC in relation to electronic word of mouth. On the other side, the message or the information receivers can easily believe and trust on the positive information and that the information comes from a trustworthy sender and website. Here we focus on the sources of messages where trusted information is being shared from one person or another and can easily be believed by the message receivers. From the websites people searching for information for reviews actually think and believes that the information from the source expertise is valuable to which it is based on their suggestions and experience in using the website and this frequently will be able to generate the trust among information seekers. The source expertise enrolls the information in peer groups, and this will help in increasing trust for information among satisfied customers (Moran & Muzellec, 2017).

H3: Users' perceived source of trustworthiness positively affects EWC.

H4: Users' perceived source expertise positively affects EWC.

Attitude is one of the main concepts that are implemented in the eWOM where it is described as a reaction based on psychology from an individual (Kudeshia & Kumar, 2017). After the evidence is provided for the expertise, trustworthiness and the general rating as in homophily and in this process it demonstrates on the involvement and relationships among users and customers. The product effectiveness and different attitudes towards the product where in this case we will be focusing on the services offered by the Vietnam Tourism. The creditability of the electronic word of mouth aims at directing positive attitudes to the consumers of the services provided. It connects with ATP which is described as an emotional expression that is most likely to be expressed by the information researchers who tend to find information based on the attitude of the product (Wang et al., 2015). Just like on the attitude to where website, there are different individuals both message senders and message receivers who tend to develop different attitudes towards the website. However, the website is designed in a way that will be able to hold all the messages from the customers who have experienced on the services and through the electronic word of mouth, the customers are able to review on the creditability for the website as well as writing comments to which may serve as positive impacts or negative impacts on the general website usage the information is the displayed is on the website for the product will create different emotional expression after the review on the product is displayed (Lee et al., 2009).

H6: EWC positively affects ATP

H7: EWC positively affects ATW

The attitude of an individual that directly or indirectly triggers their behaviours in some point (Sheppard et al., 1988). However, attitudes to which are made up of cognitive and affective attitudes are described to have positive effects on the ERA In relation to the eWOM intentions. The intentions are basically to draw a large number of tourists in to the website and search for significant information based on the tourism in Vietnam. The perceived usefulness of the website will develop different attitudes towards the users and this will general different intention on how the users will be able to access the website information. Positive comments and reviews will help significantly develop strong ATP and develop better attitudes towards the website hence more consumers will be able to access and search information within the website.

H8: ATP positively affects ERA

H9: ATW positively affects ERA.

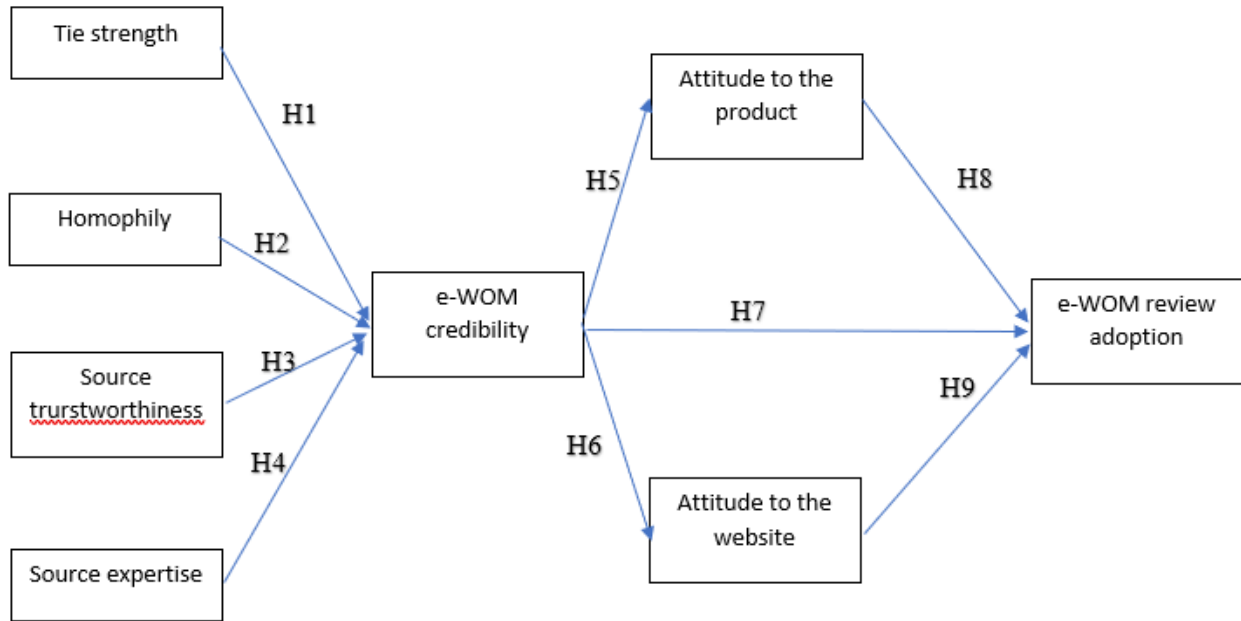


Figure 1: The conceptual framework. Source: the author's work.

3. Methodology

The tourism website in relation to the eWOM is an online tourist service and platform where in this study based on the research target and respondents are those individuals who have been using the website for over one year and are always browsing continuously the information about the website. The website is developed to acquire and have a large set of information hence large database with all different information that can be acquired by all individuals from diverse of the world. Basically, the language on the website that was used is English to which every individual's claim to be comfortable with but additional options for the translation of the language to different languages based on the originality of the tourist.

During the data collection and analysis, different methods are used which first we used the sampling and data collection methodology and this focused on the tourists who have been browsing through the website continuously and this study aimed at reviewing on the access and browse of data within the eWOM for Vietnam tourists from various tourists accessing the information system of the sector which was in a position to conduct both the pre- test and the pilot testing of the website usage and access before conducting the actual survey. Through this process of study and data collection we invited three professors who are in well knowledge of the management information system of the website and are in control of the database and also invited five active tourists who have been using the website for more than one year and have been browsing continuously. We as well conducted tests in ten rounds where each round consisted of five individuals' well known and established o the Vietnam tourism via the eWOM. In order to meet all the requirements for the final survey and questionnaire test we conducted the pilot test to some of the tourists who have been using the eWOM and the tourism website to visit Vietnam as well as to book of hotels and other visiting areas and these tests were to ensure that the questionnaire and the survey meets all the requirements and criteria expected which include; validity of conduct measurements and reliability of the test.

There was a survey conducted one month which was conducted online for the tourists and respondents who were out of the state physically and could access the online platform where we had posted the questionnaire. There are 653 respondents to the survey, of which 527 are valid.

4. Results

Upon completion of the sampling and data collection processes, a rating of about 80% of the samples were resulting to the outcome, where the chi- square test was used in that the main aim was to check on the gender, age and different percentage of responses from different individuals and tourists. The result indicated for the total age of the tourists who access and regularly uses the website is (df 10 4, χ^2 5 2.502, p 8 0.401 > 0.070) and

the living percentage of people frequently applying the website through the eWOM and contacting tourist sites for booking and others for review is as: (df 8 4, χ^2 8 0.004, p 5 1.013 > 0.080). However, during the research the null hypothesis were not rejected and this indicates that majority of the respondents came around Vietnam and a large number of tourist were said to come from Europe and the United States of America.

The demographic shows a large number of respondents are women (70%) of an age in between (27-39) years old. In giving the result and the final findings, the study used the structural Equation Model to conduct the measurement and the structural model. Following the research if the study, the tourism activity in Vietnam has been graced in that a lot of people scenery the word prefers to visit this country due to the attractions and more beautiful sceneries. A large number as discussed are from foreign countries and foreign tourists as in they come from different countries and using the Vietnam Tourism Website, they are able to reach the country before visiting and this ensures security and proper handling of tourists once they reach or visit their desired destinations.

In the measurement model, we used the AMOS software to which was able to measure the likelihood of the convergent validity of measurement model. It is through the Chi- Square tests that we were able to obtain the final result and actual numerical estimations of the samples and the findings were concluded where a large number of tourists have been able to diverge the attention into the website by booking hotels through the websites, having reviews through the eWOM. The reviews that have been given to the websites have been gaining a large number of users and tourists are widely using it. The table below shows the Measurement Model estimations that were achieved after the study and collection of data based on the tourism website reviews from different people across the world visiting the country as tourists and how often the website is being accessed.

Table 1:

Constructs	Factor Loading (λ_x/λ_y)	Measurement error (δ/ϵ)	Squared multiple correlation (SMC)	Composite reliability (CR)	Average of variance extracted (AVE)
Tie strength				0.975	0.612
TS1	0.921...	0.159	0.893		
TS2	0.949...	0.167	0.812		
TS3	0.939...	0.156	0.853		
TS4	0.912...	0.147	0.522		
Homophily				0.932	0.843
HO1	0.872...	0.098	0.889		
HO2	0.782...	0.129	0.827		
HO3	0.930...	0.742	0.841		
HO4	0.901...	0.155	0.723		
Source trustworthiness				0.877	0.778
ST1	0.790...	0.321	0.672		
ST2	0.982...	0.212	0.785		
ST3	0.822...	0.262	0.289		
Source expertise				0.853	0.850
SE1	0.914...	0.146	0.783		
SE2	0.799...	0.372	0.975		
SE3	0.874...	0.480	0.820		
Attitude to the website				0.732	0.769
ATW1	0.940...	0.173	0.432		
ATW2	0.989...	0.153	0.903		
ATW3	0.730...	0.160	0.332		

From the table above, the research tries to show that the composite reliability (CR) is valued more than 0.7 to which indicates that the website can be relied by different individuals who want to visit Vietnam on different destinations. The CR shows the internal calculation of consistence and thus indicates how reliable the website will be. The results as well indicate that the average variance extracted (AVE) is not less than 0.5 and both of the column results for Composite Reliability and the Average Variance Extracted indicate the consistency of each construct and compose of good fit model.

5. Discussion:

5.1 Theoretical Contribution

Due to the high rise and advancement of technology across the world has been the drive to the generation of more computing systems and services to which in one way or another has been able to change how business and other activities are being conducted. eWOM is one of the main technology that has been introduced in the current digitalization and information technology field in various activities like marketing, innovation or even tourism. For the Vietnam, where there has been a website developed that only deals with the Vietnam's tourism activities and different tourists and conducting different related activities to tourism. Vietnam directs the application of technology in the field of tourism due to the high rate at which the field is significant to the revenue production within the country and how well the technology will be used to communicate to different individuals from within and out of the country.

Through this website customers are able to communicate and review different sites of visits and to which they are able to choose of their desires keeping it in mind the benefits. However, as we have discussed all through, the website in the Vietnam tourism ensures that there are right and legal processes acceptable in the country however, should consider web acceptance by the tourists and ensure that there are customer's satisfaction. The study and research conducted shows that the tourists have accepted and are enrolling in to the new technology innovations in dealing with tourists in Vietnam. Throughout the study there has been of different perception and in the measure, the EWC is the most concerned concept in relation to the two attitudes developed in the measure which include the attitude towards the product and the attitude towards the website where different individuals will have different perspective on the tourism services offered as well as different attitudes on the website used for tourism.

The tourists and individuals have different tie strengths, hobbies, different interactions and different beliefs and through the websites there will be having different backgrounds to which will accommodate all kinds of tourists (Babić Rosario et al., 2020). There are consumers who have different preferences, to the consumers who turn out to having similar preferences, they tend to divide themselves in a group and share related information from the website. These tourists with similar preferences are said to having of similar in perceives of information and are more credible and trustworthy to which has led to the acceptance of the website and the eWOM technology in the Vietnam tourism. However, there has been various steps to which consumers and tourists as well as general citizens are being educated on the tourism value in relation to technology has contributed to the reviews and writings based on the tourism to which most of the positive reviews have enhanced more application of the website.

As far as the information dominants are concerned, the adoption and acceptance of eWOM is not only dictated by the strength tie or trustworthy by the consumers but also the endorsement of the consumers and expertise endorsement to which will ensure there is an increase in tourism reviews for the eWOM and the Vietnam tourism website. This study has clearly indicated that the EWC, the attitudes; ATP and the AFTP and the ERA are consistence in research where the EWC has been stated to play a significant role in the cognitive component in the process of ERA.

6. Practical Implications

Based on the practical connections and implications of the eWOM in relation to the Vietnam tourism website, there are very many sites and grounds to which can be applicable and in various ways. However, developing of this website aimed at achieving as many consumers and tourists as possible and not only from within the country Vietnam but also across other continents of the world. Technology is one of the aspects that have resulted to introduction of such concepts in tourism where it represents the real- world application and connections. This study will be going through the websites and review and in return identify how actual web or technology is working in relation to the eWOM and the tourism website. From the result we review that all individuals; intrapersonal and determinants are relatively significant in the roles of the ERA for the Vietnam tourism website.

The country in implementing the use of the website should be able to provide similar attributes to the consumers to which will lead to the equal commitments in the community and from outside visitors to Vietnam. The Vietnam Tourism Website is capable of performing various practical activities where it is able to post where the tourists can visit or the most beautiful sceneries that are present in Vietnam, the website is as well able to post

on the best hotels and places where the tourists can be hosted from foreign countries. The websites gives the tourist or the website consumer the chance to choose and pick whatever they like from the website that is within the country. Most of important activities that can be performed in the website is making payments where the tourists making orders and bookings can pay through for services or even for reservations.

The tourism website can be change the consumer attitudes or even change their attitudes to positive attitudes based on the two dual attitudes ATP and ATW where consumers will be able to develop positive attitudes towards the services provided and towards the website and giving reviews on the website. In case of any negative reviews from some consumers, the website should not delete the review but should change the negative to positive reviews and this will help in adding more positive attitudes towards the website. Regular maintenance will be required which include updates in the website where if there are two or more consumers who are interested in one thing that can only be accessed by a single person, the website will be able to reason by giving the earliest time considerations and notifying others that whatever they are applying or they want is already occupied, however, it should as well be able to update the websites.

The application of the website should be made available and as well have a well-developed user interface that will grow to be user- friendly. Daily reviews on the feedback from various consumers and tourists should be considered where the Vietnam Tourism Website will be able to know where to add or make changes through various comments and reviews from the consumers. Through the electronic word of mouth the website is able to identify all the positive or negative statements that are made by the consumers which in most cases they review to make changes or correction or even when rating the services or products offered to them.

Acknowledgement

The authors would like to thank doc. Ing. Michal Pilík, Ph.D. for his guidance.

This work is supported by the Internal Grant Agency of FaME, Tomas Bata University in Zlín no.IGA/FaME/2023/008

References

- Abubakar, A. M., Ilkan, M., & Al-tal, R. M. (2017). eWOM , revisit intention , destination trust and gender. *Journal of Hospitality and Tourism Management*, 31, 220–227. <https://doi.org/10.1016/j.jhtm.2016.12.005>
- Babić Rosario, A., de Valck, K., & Sotgiu, F. (2020). Conceptualizing the electronic word-of-mouth process: What we know and need to know about eWOM creation, exposure, and evaluation. *Journal of the Academy of Marketing Science*, 48(3), 422–448. <https://doi.org/10.1007/s11747-019-00706-1>
- Chu, S.-C., & Kim, Y. (2011). Determinants of consumer engagement in electronic word-of-mouth (eWOM) in social networking sites. *International Journal of Advertising*, 30(1), 47–75. <https://doi.org/10.2501/IJA-30-1-047-075>
- Huang, R., & Sarigöllu, E. (2014). *How Brand Awareness Relates to Market Outcome, Brand Equity, and the Marketing Mix* (pp. 113–132). https://doi.org/10.1007/978-1-4939-0277-4_8
- Ismagilova, E., Rana, N. P., Slade, E. L., & Dwivedi, Y. K. (2021). A meta-analysis of the factors affecting eWOM providing behaviour. *European Journal of Marketing*, 55(4), 1067–1102. <https://doi.org/10.1108/EJM-07-2018-0472>
- Kudeshia, C., & Kumar, A. (2017). Social eWOM: does it affect the brand attitude and purchase intention of brands? *Management Research Review*, 40(3), 310–330. <https://doi.org/10.1108/MRR-07-2015-0161>
- Lee, M., Rodgers, S., & Kim, M. (2009). Effects of Valence and Extremity of eWOM on Attitude toward the Brand and Website. *Journal of Current Issues & Research in Advertising*, 31(2), 1–11. <https://doi.org/10.1080/10641734.2009.10505262>
- Lim, W. M., Ahmed, P. K., & Ali, M. Y. (2022). Giving electronic word of mouth (eWOM) as a prepurchase behavior: The case of online group buying. *Journal of Business Research*, 146, 582–604. <https://doi.org/10.1016/j.jbusres.2022.03.093>
- Lu, B., Yan, L., & Chen, Z. (2022). Perceived values, platform attachment and repurchase intention in on-demand service platforms: A cognition-affection-conation perspective. *Journal of Retailing and Consumer Services*, 67, 103024. <https://doi.org/10.1016/j.jretconser.2022.103024>
- Mikulincer, M., Shaver, P. R., & Pereg, D. (2003). Attachment Theory and Affect Regulation: The Dynamics, Development, and Cognitive Consequences of Attachment-Related Strategies. *Motivation and Emotion*, 27(2), 77–102. <https://doi.org/10.1023/A:1024515519160>
- Moran, G., & Muzellec, L. (2017). eWOM credibility on social networking sites: A framework. *Journal of Marketing Communications*, 23(2), 149–161. <https://doi.org/10.1080/13527266.2014.969756>
- Park, D. H., & Kim, S. (2008). The effects of consumer knowledge on message processing of electronic word-of-mouth via online consumer reviews. *Electronic Commerce Research and Applications*, 7(4), 399–410. <https://doi.org/10.1016/j.elerap.2007.12.001>

- Shan, Y., & King, K. W. (2015). The Effects of Interpersonal Tie Strength and Subjective Norms on Consumers' Brand-Related eWOM Referral Intentions. *Journal of Interactive Advertising*, 15(1), 16–27. <https://doi.org/10.1080/15252019.2015.1016636>
- Sheppard, B. H., Hartwick, J., & Warshaw, P. R. (1988). The Theory of Reasoned Action: A Meta-Analysis of Past Research with Recommendations for Modifications and Future Research. *Journal of Consumer Research*, 15(3), 325. <https://doi.org/10.1086/209170>
- Suwandee, S., Surachartkumtonkun, J., & Lertwannawit, A. (2019). EWOM firestorm: young consumers and online community. *Young Consumers*, 21(1), 1–15. <https://doi.org/10.1108/YC-03-2019-0982>
- Verma, D., & Dewani, P. P. (2021). eWOM credibility: a comprehensive framework and literature review. *Online Information Review*, 45(3), 481–500. <https://doi.org/10.1108/OIR-06-2020-0263>
- Wang, S., Cunningham, N. R., & Eastin, M. S. (2015). The Impact of eWOM Message Characteristics on the Perceived Effectiveness of Online Consumer Reviews. *Journal of Interactive Advertising*, 15(2), 151–159. <https://doi.org/10.1080/15252019.2015.1091755>
- Williams, N. L., Inversini, A., Ferdinand, N., & Buhalis, D. (2017). Destination eWOM: A macro and meso network approach? *Annals of Tourism Research*, 64, 87–101. <https://doi.org/10.1016/j.annals.2017.02.007>

The Social Media Value Framework: Development and Validation of a Conceptual Framework for Value Creation

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Abstract: As social media sites continue to dominate attention, consumers are overwhelmed with content, campaigns and information in today's virtual world. How do brands and marketers stand out and ensure that their social media communications result in value creation? While multiple studies have looked at behavioural and user acceptance theories to gauge social media use, the purpose of this study is to determine whether these factors are still relevant post COVID-19 and provide a holistic view across multiple behavioural theories. The study posits that perceived benefit and cost factors can be identified that statistically influence social media engagement with resultant creation of value to consumers. The methodology follows a deductive quantitative approach. Data was obtained using an online survey with closed-ended questions for demographic responses and a seven-point Likert scale as the measurement scale for the identified constructs. A total of 493 surveys were collected with 411 usable surveys from a global audience. Various statistical techniques were used for the analysis, including factor analysis and structural equation modelling. The preliminary findings of the study reveal that two of the benefit factors have influence on the intention to be satisfied when engaging with brands' social media platforms: Perceived usefulness and perceived enjoyment had a positive influence and were seen as perceived benefits to engagement. Five benefit and cost factors, including perceived usefulness, perceived enjoyment, reciprocal communication, privacy concern and social media fatigue had a significant influence on trust and loyalty. The intention to be satisfied is highly significant when driving loyalty and trust and plays a moderating role. This study brings together multiple behavioural models and extends current knowledge on social media engagement and value creation. The study's findings will assist marketers and industry specialists to develop effective social media strategies to enhance engagement and result in increased trust and loyalty in the post COVID era.

Keywords: Social Media Engagement, Social Media Measurement, Value Creation, Social Exchange Theory.

1. Introduction

While social media has become a vital part of the communications strategy and changed the marketer-consumer interface (Dolan et al., 2019), the concern around its value remains a challenge. Social media has become more than just a marketing channel with businesses integrating social media platforms into their customer service processes and social commerce technology. The ability for businesses to understand the value and impact of social media therefore becomes even more significant, especially through the lens of how businesses can drive engagement and loyalty.

Although many academics and practitioners have focused on the concept of engagement in social media (Brodie et al, 2013), this is an evolving field and with the impact of COVID-19, needs to be re-evaluated. Recent studies have focused on antecedents and consequences of customer engagement (Van Doorn et al, 2010; Gambetti et al, 2012; Leckie et al, 2016), however few have investigated this construct looking at both social and user acceptance theories. Social media differs to many technology platforms in that it incorporates a social construct, where all information is publicly available and opinions can be formed. This brings in an element of perceived benefits and costs to the user, which forms the basis for this study.

The impact of COVID-19 has yet to be fully researched; however, with the increase in digital transformation and online engagement, there has been a rise in the use of social media by both brands and consumers, and with it an overwhelming increase in content, campaigns and information overload that has changed the nature of attention and how consumers engage (Liu et al, 2021, Mason et al, 2021).

Marketers need to show accountability for their investment in social media platforms and the value to the organisation (Fisher, 2009; Hanna, Rohm & Crittenden, 2011). However, in order to make the right investment decisions, they need to have an understanding around why consumers engage with brands on social media and whether this engagement results in the right value creation for the firm. This is fundamental to creating the right social media investment decisions and strategies for success.

With the ever-changing landscape, the overall purpose of this research is to support businesses in understanding the impact and value of social media through the development and validation of a conceptual framework for consumer behaviour when engaging with brands post COVID-19. The framework is based on consumers' perceived benefits versus costs, and considers an adaptation of social and user acceptance theories, bringing together the worlds of technology and community.

While the body of literature around social media, social media engagement and social media measurement continues to grow (Hanna, Rohm & Crittenden, 2011; Lim & Yang, 2020; Ajiboye, Harvey & Resnick, 2019), the nature of this topic is constantly evolving and adapting to the world around us. As such, there is an opportunity to continually revisit these subjects in order to determine whether the changes we are facing such as COVID-19 and digital transformation have in fact changed what we know about this dynamic field.

This study aims to contribute to the current literature by providing a thorough understanding of the behavioural factors that drive intention to engage on social media and the resulting behaviours through the lens of perceived benefits versus perceived costs. The research objective includes the development of a conceptual model incorporating behavioural factors from both social and user acceptance theories that influence social media engagement in order to predict value creation. The study will also look to test the inter-relationships between the identified constructs and their influence on engagement and value creation.

2. Literature Review

The rapid growth of social media has changed the way people communicate: the rise of this influential channel has seen a shift in marketing to a two-way engagement process between businesses and their consumers (Drury, 2008; Malthouse et al, 2013). Social media platforms have created a change in consumer behaviour; empowered by social media platforms, consumers now have more control and are able to define their own perspectives on businesses and brands (Bernoff & Li, 2008; Christodoulides, Jevons & Bonhomme, 2012). The ability of consumers to create and share content across social media platforms is significantly impacting businesses' reputations and sales (Kietzmann et al, 2011). To successfully take advantage of social media, businesses need to embrace this shift towards social customer relationship management (CRM) by designing experiences that offer tangible value for consumers in return for their 'time, attention, endorsement and data (Heller Baird & Parasnis, 2011).

2.1 Social media engagement

Businesses do however need to take cognisance that consumers are only willing to engage with brands on social media platforms if they consider the interactions as beneficial. The perception that consumers want to be part of a community and feel connected to the brand is often just a misconception of the business (Muniz & O'Guinn, 2001). Trust plays an important role in deciding whether to engage with the business and choosing social media as the optimum channel in getting the value they require. Chiu et al (2012) highlight the importance of trust and further argue that post COVID, organisations need to prioritise accountability and transparency to build and maintain trust. Consumers who do engage with businesses through social media will already have an affinity for the brand, however engagement will not necessarily reflect in a direct increase in spend or loyalty. The power of social media is through the community influence and the role of endorsements to family and friends, extending the potential network (Heller Baird & Parasnis, 2011).

2.2 Social media measurement

While social media continues to experience growth, the greatest challenge remains measurement (Fisher, 2009; Hoffman & Fodor, 2010; Valos, Polonsky, Mavondo & Lipscomb, 2014). Businesses are finding it difficult to understand the contribution of social media to business performance. Businesses need to show accountability for their investment in social media activities and the resulting value creation of these programs for the business (Fisher 2009).

Creating a presence on social media is of little value unless you do something with it (Blanchard, 2011; Gibbs & Allard, 2014). Measuring success in social media often translates into demands for proof of return on investment (Weinberg & Pehlivan, 2011; Gibbs & Allard, 2014), however Hoffman & Fodor (2010) suggest marketers are approaching return on investment (ROI) in the wrong way. ROI can be measured, but it requires a new set of measurements, starting with customer investment. Through consideration of customer motivations and the

investments customers make when engaging with brands, marketers can focus on long-term returns of social media investment.

2.3 The Social Media Value Chain

While there are several frameworks for marketing performance measurement, highlighting a value-based approach, linking marketing activities to financial outcomes and performance, there is little consistency in the different applications with none of these frameworks adopting the ideas of value-based measurement as proposed by Keller and Lehmann (2003).

2.3.1 Introducing the social media value chain

The framework for the social media value chain is made up of three key areas including firm investments, community management and return (Littlewood & Bick, 2015). Influences on social media implementation and success are provided as well as a feedback loop to ensure a continuous process of improvement. The framework assists businesses in understanding the value of social media from initially creating the strategy and objectives through to the return on investment from successful implementation.

Factors affecting the perception and influence of these social media communications on the community and consumer form part of the value chain, with results feeding back into the business as part of continuous improvement. This is illustrated in Figure 1 below:

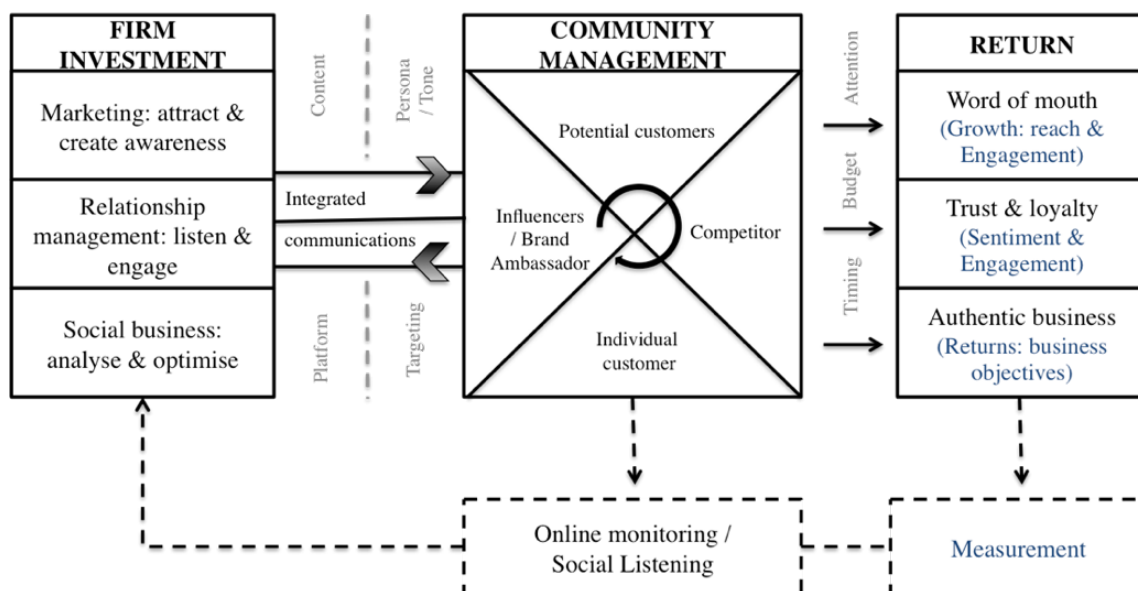


Figure 1: The Social Media Value Chain (Source: Littlewood & Bick, 2015)

2.4 Theoretical framework

Research posits that it is unlikely for a single-variable model to adequately predict acceptance of a new technology or platform and propose the combination of variables from multiple disciplines and theories. This multi-faceted view is supported by Azjen (1991), which suggests that behaviour is complex and requires a multi-dimensional model to predict. In support of this view, the following theories have been reviewed to incorporate the relevant factors into the conceptual model.

2.4.1 Theory of Reasoned Action (TRA)

One of the core models from which a wide range of theories has been derived is the Theory of Reasoned Action (TRA). This theory looks at predicting a specific behavioural intention that influences the subsequent behaviour. Azjen and Fishbein (1973) examined the relationship between attitude and behaviour and proposed two factors that influence behaviour, namely an individual's attitude determined by their own beliefs and a subjective norm, influencing the perception to behave in a certain manner. TRA provides a generalised model that looks to explain

the factors that influence human behaviour when making decisions and performs well when applied outside the original conditions (Sheppard, Hartwick & Warshaw, 1988).

2.4.2 *Technology Acceptance Model (TAM)*

The Technology Acceptance Model is derived from a number of theories and attempts to predict user acceptance of technology focusing on two factors (Davis, 1989), including Perceived Usefulness (extent to which an individual considers a specific technology is beneficial) and Perceived Ease of Use (extent to which an individual considers use of a specific technology as effortless). Prior research shows that TAM can be applied to various contexts and provide relevant results, however requires additional models to consider the motivational elements that drive technology adoption.

2.4.3 *Theory of Planned Behaviour (TPB)*

The Theory of Planned Behaviour, an extension of Theory of Reasoned Action, is one of the most widely researched user acceptance theories. Ajzen (1991) agrees with this multi-faceted view that humans are complicated and therefore a multi-dimensional approach to visualising human behaviour is required (Nelmapius & Boshoff, 2016). While TPB has been the source of some debate around its limited conditions, the theory is widely used for the expectation of human behaviour and will therefore be adapted and incorporated into the conceptual framework. One of the constructs that varies quite substantially across studies is the intention-behaviour correlation. Mediating factors can impact the intent to behave in a certain way resulting in a weak correlation. This is an important consideration for social media, especially with organisations measuring metrics such as 'likes' and 'shares' which might only hint at an intention and not translate into an actual action.

2.4.4 *Social Exchange Theory*

The Social Exchange Theory looks at how individuals form relationships with others and posits that individuals will engage in a social exchange when the benefits outweigh the costs and therefore apply a cost-benefit analysis, which we have also seen applied to the Technology Acceptance Model. This theory proposes that individuals will seek to maximise their rewards and minimise the costs in social interactions. Further to this, individuals will evaluate relationships based on the rewards they expect to receive. Homans (1958) also introduces the concept of reciprocity, where individuals exchange benefits to maintain social relationships. When applied to social media, the Social Exchange Theory proposes that individuals engage in social media exchanges because the rewards or benefits outweigh the costs, however the comparison that comes with social media platforms can result in a sense of inequity, which can result in the end of the exchange (Cook et al, 2013).

2.5 **Conceptual model**

The proposed conceptual model was developed to examine relationships between the various behavioural factors on the intent to engage with brands on social media as well as the resulting value creation. The overall lens to the model is based on Social Exchange Theory, where consumers are faced with looking at perceived benefits against the perceived costs and whether this has an impact on the intent to engage with brands. The model was developed by integrating various factors across multiple social and user acceptance theories, including TRA, TAM, TPB and the Social Exchange Theory. TAM and TPB are regarded as influential theories in this space and this model extends the thinking to incorporate additional factors identified in the literature and Social Media Value Chain (SMVC) from previous research (Littlewood & Bick, 2015).

The model looks at both perceived benefits (e.g., perceived enjoyment, perceived usefulness, reciprocal communications) and perceived costs (privacy risk and social media fatigue) from a consumers' perspective when engaging with brands' social media communications. Moderating factors, including the type of platform as well as the usage on social media are added to the model as a consideration. Ultimately the model looks to determine the relationship between engagement and value creation, including loyalty and trust.

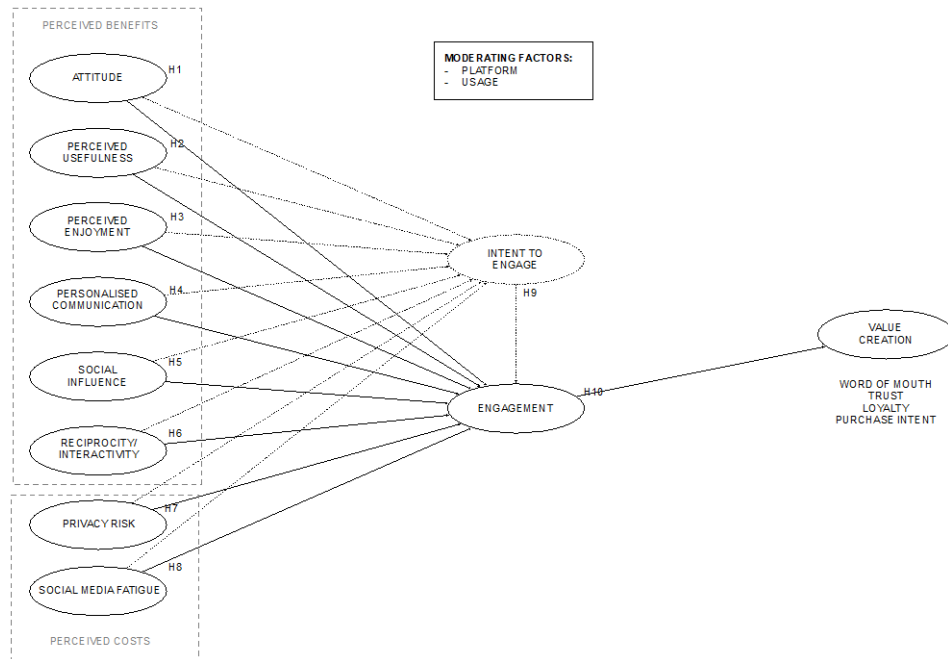


Figure 2: Proposed conceptual framework based on literature review and prior research

The antecedents of the intent to engage and engagement with brands on social media are separated into perceived benefits and perceived costs, and include the following constructs and the associated hypotheses:

- Attitude – a consumer’s positive or negative feeling to performing the expected behaviour (Ajzen, 1991)
H1: Attitude is positively related to social media engagement
- Perceived usefulness – extent to which a consumer believes that their efficiency would improve using social media (Davis, 1989).
H2: Perceived usefulness is positively related to social media engagement
- Perceived enjoyment –how much consumers enjoy using and engaging with social media, regardless of the usefulness (Davis, Bagozzi & Warshaw, 1992).
H3: Perceived enjoyment is positively related to social media engagement
- Personalised communication – the right message at the right time using the right channel. Ensuring that communication, messaging and imagery are relevant to the target consumer (Littlewood & Bick, 2015). According to Kreuter et al (1999), tailored communications are believed to be more credible, better recalled and more successful in influencing behaviour.
H4: Personalised communication is positively related to social media engagement
- Social influence – the degree to which social peers, family or friends influence the decision to behave in a certain way (Littlewood & Bick, 2015). Posey et al (2010) believe that cultural inclinations directly influence individuals and maintain that social influence is an important factor, which is supported by Bandura’s (1977) social learning theory stating that behaviours are learned responses from other individuals within the environment.
H5: Social influence is positively related to social media engagement
- Reciprocity – the two way engagement between organisation and consumer resulting in value creation for both parties (Littlewood & Bick, 2015). Benefits can be displayed through reciprocity (Altman & Taylor, 1973) and further maintain or strengthen the social relationship (Homan, 1958).
H6: Reciprocity is positively related to social media engagement
- Privacy risk – the concern for loss of anonymity, potential theft of information and invasion of privacy (Nelmapius & Boshoff, 2016)

H7: Privacy risk is negatively related to social media engagement

- Social media fatigue – feeling of exhaustion resulting from prolonged use of social media that can lead to decreased satisfaction and motivation to use social media (Liu et al, 2021; Zhang et al, 2020)

H8: Social media fatigue is negatively related to social media engagement

3. Methodology

A deductive research approach was used to test and validate relationships within the conceptual framework. The measurement instrument (a self-administered questionnaire) was based on prior qualitative research derived from the Social Media Value Chain as well as the additional literature review to test the hypotheses developed. A pilot study was conducted to ensure the questions in the questionnaire were clear and concise and relevant to the target audience.

The sample population included consumers that engage with businesses through social media platforms. Questionnaires were distributed across multiple demographics to allow for diversified backgrounds. The sample size was an important factor in achieving statistical significance and as a result, a second iteration of the survey was required. Snowball sampling was incorporated to extend reach to a wider audience through referrals and resulted in the questionnaire being distributed globally.

Data was analysed using exploratory factor analysis (EFA) to explore the underlying structure and relationships for this large set of antecedents and moderators. Confirmatory factor analysis (CFA) was then be used to verify the structure and test the hypotheses between the variables and their underlying construct (Bryman & Bell, 2012).

Structural equation modelling (SEM) was completed to provide a more accurate synthesis of the data to identify the direct and indirect influences on social media engagement as well as the strength of the relationships. SEM is a measurement technique that is more suited to complex relationships and allows for analysis of several variables for a single independent or dependent variable. The strength of this technique is that it allows the researcher to consider a number of possible alternatives to find the variables with statistical significance (Hair et al, 2010).

4. Preliminary Analysis and Findings

4.1 Respondent profile

The final sample size used for this study comprised a total of 411 global respondents, however the majority (89.8%) were located in South Africa. The gender profile of the respondents was 66.4% female and 33.1% male, with the majority falling between the ages of 20 and 39 (64.7%). The level of education was high with 89.6% declaring to have a degree or diploma.

From a behavioural profile, 75.9% of the respondents have used social media platforms for more than 5 years with 52.8% spending between 1 and 4 hours per day on social media on average. Interestingly, the daily average pre and post COVID did see an increase from 5.8% to 18.4% in the 5 to 8 hours daily category.

Respondents were split around the frequency with which they engage with brands on social media channels, with 25.1% stating a few times a year, 24.6% all the time and 23.6% weekly. 55.7% also agreed that their interactions with brands during COVID had increased due to respondents preferring not to go into physical shops and stating that social media channels were more efficient and brands more accessible.

In terms of the preferred social media channels, the majority selected Facebook (72%) with Instagram (63.5%) and WhatsApp (54.5%) also proving popular. Interestingly, the majority of respondents opted to use these sites mainly for research (63%), inspiration (62%) and passing time (54.9%) with only 18% purchasing either luxury or essential goods, perhaps reflective of the privacy and risk concerns when purchasing on social media platforms.

4.2 Model validation

Structural equation modelling (SEM) was chosen to validate the proposed conceptual model and test the hypotheses. SEM involves both the measurement model, which relates to the observable constructs (factors), and the structural model, which represents the interrelationships between the latent constructs (Hair et al, 2010). Based on Hair (2010), the recommended stages for SEM include: defining individual constructs,

developing the measurement model, designing the study for empirical results, assessing measurement model validity, specifying the structural model and assessing structural model validity.

The individual constructs were defined from the literature review and the proposed conceptual model was created based on an existing set of scales. Initial analysis was required to optimise the measurement model based on the combination of scales. Standard factor analysis was used to identify strong loading of factors and to assess the convergent and divergent validity. The adjusted constructs met the threshold of the measurement model with a Goodness of Fit Index (GFI) of 0.87 and the Adjusted Goodness of Fit Index (AGFI) of 0.84. The Root Mean Square Error of Approximation (RMSEA) was within the acceptable range of 0.05 to 0.08 (Cunningham, 2008) at 0.054 and the Standardized RMR at .0497, which falls into the acceptable range of between 0 and 0.08 (Hu & Bentler, 1999). Finally the Comparative Fit Index (CFI) demonstrated a good fit at 0.929 (Kline, 2011).

The proposed conceptual model included 14 constructs, which was later optimised to the final 9 constructs included in the measurement model: attitude, perceived usefulness, perceived enjoyment, personalised communication, social influence, privacy concern, social media fatigue, intent to be satisfied and loyalty and trust. The structural model was used to test the proposed conceptual model and defined hypotheses. The resulting indices suggest a good fit with a GFI of 0.895, AGFI of 0.865, CFI of 0.942, RMSEA of 0.059 and SRMR of 0.0546.

The initial findings show a positive influence of two factors, perceived usefulness and enjoyment on the newly defined factor: intent to be satisfied. This highlights an interesting shift from the intent of a behaviour, namely to engage with the brands to the expectation of the consumer, which is to be satisfied when engaging with the brand. Five of the variables, including: perceived usefulness, perceived enjoyment, personalised communication, privacy concern and social media fatigue had significant influence on the value creation factor of trust and loyalty. The intent to be satisfied is highly significant when driving loyalty and trust and plays a moderating role.

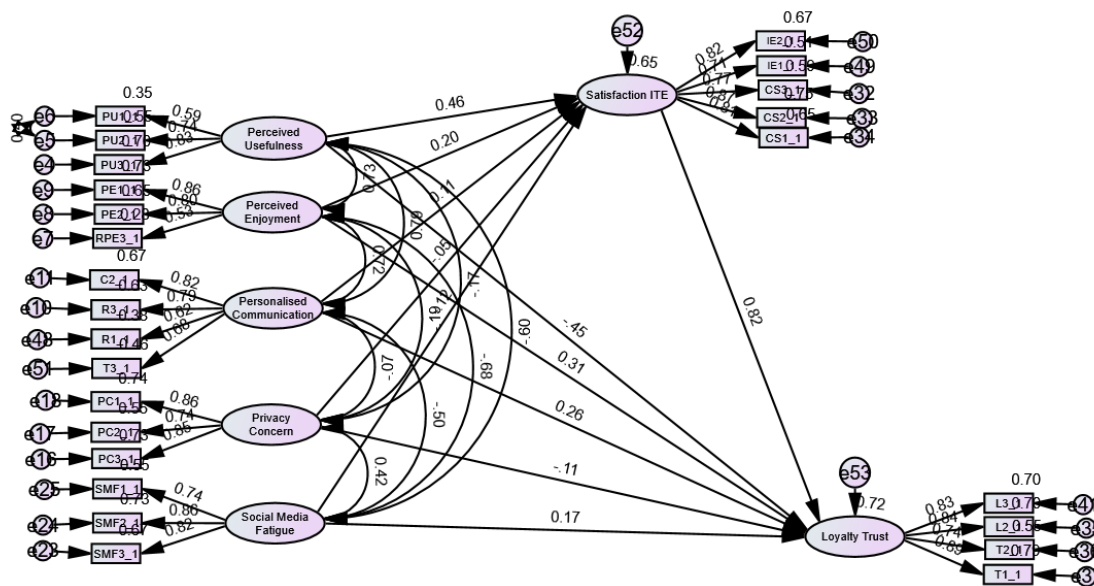


Figure 3: Full Structural Model

A simplified structural model will be adapted in the final research submission to further clarify the relationships and hypotheses testing. Multi group analysis will also be conducted on the social media usage, looking at the increase in usage of social media channels post COVID.

5. Conclusion

This study aims to contribute to the body of knowledge from a theoretical, empirical and practical perspective by developing an updated model looking at the impact of perceived benefits and costs on the intent to engage with brands on social media post COVID-19. The proposed conceptual model was developed based on literature and incorporated the behavioural theories of TRA, TAM, TPB and the social exchange theory together with the social media value chain derived from prior research. Whilst these theories have been used to determine social

media engagement, there is a need post COVID-19 to further examine these constructs. This is an initial development of constructs, the findings of which could be used to define and build stronger models in future research.

Following the preliminary analysis and findings, further exploration of the data including multi group analysis as well as exploration of the benefits versus costs regression coefficients will be conducted. A discussion of the findings and implications for theory and practice will be completed and the future research directions highlighted.

References

- Ajiboye, T., Harvey, J. and Resnick, S., 2019. Customer engagement behaviour on social media platforms: A systematic literature review. *Journal of Customer Behaviour*, 18(3), pp.239-256.
- Altman, I. and Taylor, D.A., 1973. *Social penetration: The development of interpersonal relationships*. Holt, Rinehart & Winston.
- Ajzen, I., 1991. The theory of planned behavior. *Organizational behavior and human decision processes*, 50(2), pp.179-211.
- Ajzen, I. and Fishbein, M., 1977. Attitude-behavior relations: A theoretical analysis and review of empirical research. *Psychological bulletin*, 84(5), p.888.
- Bandura, A., 1977. Self-efficacy: toward a unifying theory of behavioral change. *Psychological review*, 84(2), p.191.
- Bernoff, J. and Li, C., 2008. Harnessing the power of the oh-so-social web. *MIT Sloan management review*, 49(3), p.36.
- Blanchard, O. (2011). *Social Media ROI: Managing and Measuring Social Media Efforts in Your Organisation*. US: Pearson Education Inc.
- Brodie, R.J., Ilic, A., Juric, B. and Hollebeek, L., 2013. Consumer engagement in a virtual brand community: An exploratory analysis. *Journal of business research*, 66(1), pp.105-114.
- Bryman, A., & Bell, E. (2011). *Business research methods* (3rd ed.). Oxford University Press.
- Christodoulides, G., Jevons, C. and Bonhomme, J., 2012. Memo to marketers: Quantitative evidence for change: How user-generated content really affects brands. *Journal of advertising research*, 52(1), pp.53-64.
- Chiu, C.M., Hsu, M.H., Lai, H. and Chang, C.M., 2012. Re-examining the influence of trust on online repeat purchase intention: The moderating role of habit and its antecedents. *Decision Support Systems*, 53(4), pp.835-845.
- Cook, K.S., Cheshire, C., Rice, E.R. and Nakagawa, S., 2013. Social exchange theory. *Handbook of social psychology*, pp.61-88.
- Cunningham, E. G. (2008). *A Practical Guide to Structural Equation Modeling Using Amos*. Melbourne: Statsline.
- Davis, F.D., 1989. Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS quarterly*, pp.319-340.
- Davis, F.D., Bagozzi, R.P. and Warshaw, P.R., 1992. Extrinsic and intrinsic motivation to use computers in the workplace 1. *Journal of applied social psychology*, 22(14), pp.1111-1132.
- Dolan, R., Conduit, J., Frethey-Bentham, C., Fahy, J. and Goodman, S., 2019. Social media engagement behavior: A framework for engaging customers through social media content. *European Journal of Marketing*, 53(10), pp.2213-2243.
- Drury, G. (2008). Social media: Should marketers engage and how can it be done effectively? *Journal of Direct, Data and Digital Marketing Practice*, 9(3), 274-277. doi: 10.1057/palgrave.ddmp.4350096
- Fisher, T., 2009. ROI in social media: A look at the arguments. *Journal of database marketing & customer strategy management*, 16, pp.189-195.
- Gambetti, R.C., Graffigna, G. and Biraghi, S., 2012. The grounded theory approach to consumer-brand engagement: The practitioner's standpoint. *International Journal of Market Research*, 54(5), pp.659-687.
- Gibs, J., & Allard, K. (2014). Measuring success in social media. Retrieved 20 July, 2014 from: <http://www.hugeinc.com/ideas/report/social-roi>
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis* (7th ed.). Upper Saddle River, N.J.: Prentice Hall.
- Hanna, R., Rohm, A. and Crittenden, V.L., 2011. We're all connected: The power of the social media ecosystem. *Business horizons*, 54(3), pp.265-273.
- Heller Baird, C. and Parasnis, G., 2011. From social media to Social CRM: reinventing the customer relationship. *Strategy & Leadership*, 39(6), pp.27-34.
- Hoffman, D.L. and Fodor, M., 2010. Can you measure the ROI of your social media marketing?. *MIT Sloan management review*.
- Homans, G.C., 1958. Social behavior as exchange. *American journal of sociology*, 63(6), pp.597-606.
- Hu, L.T. and Bentler, P.M., 1999. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural equation modeling: a multidisciplinary journal*, 6(1), pp.1-55.
- Keller, K.L. and Lehmann, D.R., 2003. How do brands create value?. *Marketing management*, 12(3), pp.26-26.
- Kietzmann, J.H., Hermkens, K., McCarthy, I.P. and Silvestre, B.S., 2011. Social media? Get serious! Understanding the functional building blocks of social media. *Business horizons*, 54(3), pp.241-251.

- Kline, R. B. (2011). *Principles and Practice of Structural Equation Modeling*. New York: Guilford Press.
- Kreuter, M.W., Strecher, V.J. and Glassman, B., 1999. One size does not fit all: the case for tailoring print materials. *Annals of behavioral medicine*, 21(4), pp.276-283.
- Littlewood, K. and Bick, G., 2015, July. Developing the social media value chain: a conceptual framework for the measurement of social media. In *Proceedings of the 2nd European Conference on Social Media ECSM 2015* (pp. 297-305). Lim, K. H., & Yang, S. U. (2020). Social media marketing: Review and research directions. *Journal of Business Research*, 117, 627-633.
- Liu, H., Liu, W., Yoganathan, V. and Osburg, V.S., 2021. COVID-19 information overload and generation Z's social media discontinuance intention during the pandemic lockdown. *Technological Forecasting and Social Change*, 166, p.120600.
- Malthouse, E.C., Haenlein, M., Skiera, B., Wege, E. and Zhang, M., 2013. Managing customer relationships in the social media era: Introducing the social CRM house. *Journal of interactive marketing*, 27(4), pp.270-280.
- Mason, A.N., Brown, M., Mason, K. and Narcum, J., 2021. Pandemic effects on social media marketing behaviors in India. *Cogent Business & Management*, 8(1), p.1943243.
- Muniz, A.M. and O'guinn, T.C., 2001. Brand community. *Journal of consumer research*, 27(4), pp.412-432.
- Nelmapius, A. and Boshoff, C., 2016. A motivational perspective on the user acceptance of social media. *South African Journal of Business Management*, 47(4), pp.1-13.
- Posey, C., Lowry, P.B., Roberts, T.L. and Ellis, T.S., 2010. Proposing the online community self-disclosure model: the case of working professionals in France and the UK who use online communities. *European journal of information systems*, 19, pp.181-195.
- Sheppard, B.H., Hartwick, J. and Warshaw, P.R., 1988. The theory of reasoned action: A meta-analysis of past research with recommendations for modifications and future research. *Journal of consumer research*, 15(3), pp.325-343.
- Valos, M., Polonsky, M.J., Mavondo, F. and Lipscomb, J., 2015. Senior marketers' insights into the challenges of social media implementation in large organisations: assessing generic and electronic orientation models as potential solutions. *Journal of Marketing Management*, 31(7-8), pp.713-746.
- Van Doorn, J., Lemon, K.N., Mittal, V., Nass, S., Pick, D., Pirner, P. and Verhoef, P.C., 2010. Customer engagement behavior: Theoretical foundations and research directions. *Journal of service research*, 13(3), pp.253-266.
- Vrontis, D., Makrides, A., Christofi, M. and Thrassou, A., 2021. Social media influencer marketing: A systematic review, integrative framework and future research agenda. *International Journal of Consumer Studies*, 45(4), pp.617-644.
- Weinberg, B.D. and Pehlivan, E., 2011. Social spending: Managing the social media mix. *Business horizons*, 54(3), pp.275-282.
- Zhang, Y., Liu, Y., Li, W., Peng, L. and Yuan, C., 2020. A study of the influencing factors of mobile social media fatigue behavior based on the grounded theory. *Information Discovery and Delivery*, 48(2), pp.91-102.

Unethical Practices and Online Business: Perspectives of DSMM Users

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Abstract: The purpose of this paper was to review literature related to unethical practices and online business. The aim is to understand the perspectives of digital social media and mobile (DSMM) users. In order to do so, this paper was guided by five key objectives: to investigate the nature and types of unethical practices that are unique in online business, to determine the causes of unethical online business practices, to determine how users of DSMM are affected by the unethical practices/behaviors, to identify how the unethical practices/behaviors in online businesses can be minimized/ameliorated in order to protect online users, and to identify gaps that exist with regard to unethical practices and online business. The findings of this research paper indicate that there exists various types of unethical practices in online business which include; online insecurity, mistrust, unreliability of delivery of products and services and deception. The causes of unethical practices in online business are greed, poor compliance with the legal requirements for doing business, aggressive competition and insufficient legislative. The DSMM users tend to be affected by these unethical practices in a number of ways that include; loss of customer loyalty, unsatisfied customers and loss of business reputation. Finally, this research found that the unethical practices could be ameliorated by raising awareness about the ideals of ethical behavior in various forums and providing appropriate punishment for unethical behaviors, being truthful, honest, and prompt in all disclosures and external reporting. Based on these findings, this research work concludes that many online businesses, similar to other businesses have a weak ethical culture, and little progress has been achieved to reduce misconduct. Also, the study concluded that the consumer protection laws such as Consumer Protection Act in Kenya have far-reaching impact on (online) businesses; that businesses have significant roles to play in consumer protection and in the ethical transformation of business sector and that law do play significant roles in putting pressure on businesses to act in ethically responsible manner.

Keywords: Ethics, DSSM, Business, Marketing

1. Background of the Study

Unethical business practices have been defined variously by different scholars. For instance, Singh and Twalo (2015) define it as any act within a business that falls short of the minimum company code of conduct criteria. On his part Martin (2019) define it as an action taken by an individual or an organization that is incorrect and unacceptable according to moral principles or beliefs while We therefore find that unethical business practices are those incorrect behaviors that deviate from the ground principles of businesses.

In business, ethics establishes the ground principles for businesses, groups, and even individuals to follow. Doing business in a legal and ethical manner benefits not just the company but also its stakeholders, which include employees, customers, suppliers, and investors (Boatright, 2018). Boatright (2018) also observe that implementing ethics in business allows the company to boost employee motivation, commitment, and performance at work, and the organization benefits from relationships with suppliers. In online businesses, Chaffey, Edmundson-Bird and Hemphill (2019) observe that it is critical for stakeholders to have confidence that the online data acquired by corporations is secure and that every electronic transaction in online businesses is secure. This is because many information-security breaches can have a negative impact not just on stakeholders but also on the company's shares and financial strength.

Moral and ethical issues have become increasingly relevant in organizations and corporate contexts globally. In Germany for example, Robinson and Bennett (2016) observe that the undermining of moral standards and a lack of commitment to rules preventing unethical behavior and wrongdoings jeopardize the dependability and profitability of German businesses. In the same vein Schreyogg and Steinmann (2019) observe that corporate ethical failures have led the German company Siemens to agree to a \$1.6 billion settlement to remedy the negative consequences of their bribery actions in emerging market. As a result, Germans have embraced ethics as an essential component of daily business practice, much as corporate social responsibility is (Hussain, Shahzad, Hassan & Doski, 2021).

Globally, online business networks on social trading have brought e-commerce ethics and the COVID-19 pandemic increased unethical commercial activities all across the world. In particular, Hussain, Shahzad, Hassan and Doski (2021) observe that Pakistan developed online channels to generate revenue during and after a pandemic crisis but the sellers' fraudulent sales rose during the pandemic and continue to occur as a result of Pakistan's lack of control in the sphere of e-commerce

Sub-Saharan African countries, particularly Nigeria, have reached alarming levels, with the country being singled out as one of the countries with the highest rates of electronic fraud (Ogundele, Hassan, Idris & Aliu, 2018). To strengthen the consumer-brand relationship there is need to evaluate and support a company's moral aspect and ethical ties with customers.

In Kenya, there is an increase in adoption and expansion of internet and related increase of online businesses. Indeed, Kenya has seen great adoption and expansion of internet usage over the previous two decades, resulting in a 2.9 percent rise in Kenya's Gross Domestic Product (GDP) (Mutula, 2018). However, while this increase in acceptance and usage has offered several financial opportunities, it has also introduced a slew of ethical and social concerns to corporate enterprises. A recent report by the Ministry of Information, Communications and Technology of 2020, shows that Kenya loses over 2 billion Kenya shillings each year as a result of cybercrime, prompting the need to implement appropriate legislation that strike a balance between individual rights to privacy and the communal good of the country and its residents. Therefore, the Kenyan government could evaluate the necessity of resolving online business trust, security, and privacy.

Unethical practices fall into four broad categories: unethical customer behaviors, unethical staff practices, unfair competition, and legal but unethical tactics (Kaptein, 2018). Businesses have inflated the benefits of their products while downplaying the drawbacks. However, unethical business practices will persist unless consumers become aware. Indeed, to rebuild and sustain a culture that promotes honest and ethical behavior, Remisova, Lasakova and Bohinska (2019) argue that corporate leaders must promote an ethical environment verbally and aggressively by making ethical behavior a priority on the organization's agenda. They must adopt business ethics rules to guide employees' actions. Titus and Bradford (2016) advise that annual corporate ethics training for workers, as well as a solid whistleblowing system, should be established.

In online businesses, most organizations use their social media platform accounts to attract the public. But these platforms can instantly bring down organizations if they are affiliated with something deemed inappropriate by the public, hence destroying their public image (Kim & Ko, 2019). To mitigate this, businesses must engage seriously with the public, to the extent of implementing all professional principles of customer service and communication management. Moreover, as observed by Gonzalez-Herrero and Smith (2020), it is critical for businesses to anticipate the possibility of a crisis before it becomes deplorable.

In the same line of argument, Weller (2017) observes that Social media has changed the way people, communities, and organizations generate, distribute, and consume information. Social networks have also aided people in communicating, breaking down geographical obstacles that previously limited quick connection, allowing for successful social media-facilitated collaboration. However, many social media users are also confronted with new issues linked with the negative aspects of social media use. These include, among other things, ethical and privacy violations, data exploitation and misuse, and the legitimacy of social media material. Because of the complexity and intangibility of the digital environment, some ethical issues have arisen. As the number of e-transactions increases, so do the number of ethical issues.

1.1 Objectives of the Study

The purpose of this study is to evaluate unethical practices and online business: a perspective of DSMM users. The specific objectives are:

- To investigate the nature and types of unethical practices in online business
- To determine the causes of unethical practices in online business practices
- To determine how users of DSMM are affected by the unethical practices in online business
- To identify how the unethical behaviors in online businesses can be minimized in order to protect online users, and to identify gaps that exist with regard to unethical practices and online business.

2. Literature Review

This chapter underlines the empirical review based on the objectives of this study. It presents the findings of the research and reveals the gaps of the study.

2.1 Empirical Review

The discussion in this subsection is guided by research objectives.

2.1.1 *Nature and Types of Unethical Practices on Online Business*

A number of studies have examined ethical issues in online businesses. For instance, Sharma and Lijuan (2016) conducted an empirical examination into the ethical viewpoints on e-commerce. An online survey of Second Life users was undertaken to investigate ethical issues in e-commerce and the factors that influence them. The ethical performance of the e-commerce website will foster an increase in trust, which will promote customer commitment and loyalty. It was also observed that E-commerce networks are becoming increasingly important in online business, and consumers are becoming increasingly concerned about e-commerce ethics such as security, privacy, and trust.

A related study by Agag (2019) investigated the nature of online business ethics and their impact on buyer repurchase intentions and loyalty in a small and medium Egyptian business. The results of using SEM to analyze data collected from a sample of SME e-commerce firms in Egypt show that buyers' perceptions of supplier ethics construct are composed of six dimensions that include security, non-deception, fulfilment/reliability, service recovery, shared value, and communication and are strongly predictive of online buyer repurchase intentions and loyalty. Furthermore, the findings show that the most effective relationship-building dimensions are dependability/fulfilment and non-deception.

Through the lens of online retailing, Nardal and Sahin's (2019) explored ethical challenges in e-commerce. They used a survey of 400 internet shoppers in three cities in Turkey (Izmir, Manisa, Mersin) in order to assess consumers' perceptions of ethical issues in online purchasing utilizing a scale of Consumers' Perceptions regarding to Ethics of Online Retailers (CPEOR). Ethical problems like security, privacy, reliability and non-deception on Internet are core issues that limit the growth of online retailing. Findings indicate that; four factors (security, privacy, non-deception and reliability) are strongly predictive of online consumers' satisfaction.

Thus, we find that the nature and types of unethical practices that includes, insecurity, mistrust and unreliability in product and service provision negatively affects the successful online business transaction. It negatively influences potential buyers' decisions to interact with sellers. These types also have a higher significance in online business operations as customers often have little knowledge of sellers and must deal with doubt, uncertainty and risks.

2.1.2 *Causes of Unethical Practices on Online Business*

In Pakistani, Zaman, Phil, Mahmood, Scholar, and Arslan (2015) investigated the causes of ethical considerations on advertisement effectiveness as a case study. According to the study's findings, celebrity endorser ethics have a negligible impact on advertising ethics.

In Australia, Al-Saggaf, Burmeister and Weckert (2015) did an empirical investigation on the reasons behind unethical behaviour in the Australian Information Communication Technology (ICT) workplace. A qualitative research methodology was used in the investigation. During the month of February 2014, 43 ICT professionals were interviewed in six Australian capital cities. All interviews were performed face-to-face and used a semi-structured interviewing technique that included open-ended inquiries as well as additional probing questions. The purposive sample included ICT specialists from large and small organizations, as well as the public and private sectors. Thirty percent of participants agreed on five significant causes for unethical behavior in ICT settings out of the 25 reasons identified: pressure, poor management, avarice, a lack of regard for ICT, and communication problems.

A meta-analysis study was conducted to investigate what triggers unethical behavior (Belle & Cantarelli, 2017). The analysis revealed that exposure to misbehaving in-group members or individuals who benefit from unethical behaviors, greediness, egocentrism, self-justification, exposure to incremental dishonesty, loss aversion, hard performance goals, or time pressure all enhance unethical behavior. Employee monitoring, moral reminders, and individuals' willingness to preserve a positive self-image, on the other hand, reduce unethical behavior.

Relatedly, Ayuba and Aliyu (2018) conducted research on unethical business activities in Nigeria: causes, repercussions, and control. The study discovered that most customer complaints about ethical abuses were common in the mobile telecommunications, health, manufacturing, and automobile sub-sectors, where unethical business practices were caused by a combination of three broad factors, namely, external factors (aggressive competition and insufficient legislative elaboration), personal characteristics (greed) and improper control (poor compliance with the legal requirements) which for doing business in Nigeria,.

In Kenya, Mwangi (2019) conducted research on ethics management among Kenyan contractors. The study took a descriptive survey technique, with structured questionnaires used to collect primary data. According to the study findings, the majority of construction organizations surveyed (80.6 percent) have an ineffective ethics management system and lack established ethical decision-making procedures. They do not have proper ethics guidelines, such as a code of ethics or value declarations. There was also a lack of commitment from senior management to strengthening ethics management in their own organizations, as seen by a lack of ethics infrastructure, with just 10% having ethics divisions.

We therefore find that unethical practices are caused by peer pressure, poor management modeling, and so on. Management frequently puts pressure on employees to act unethically or to obtain profitable business at any cost, which may include the use of any dirty tricks. Employees may choose to act unethically based on unrealistic expectations to succeed. Many businesses make the mistake of assuming that their employees understand what behaviors are unethical.

2.1.3 Effects of Unethical Practices on Online Business

Unethical practices affect customers and businesses in many ways. In Mekelle, Ethiopia, Negassa (2015) investigated the effects of business ethics on consumers' impressions of merchandising and service-giving enterprises. The study's target group was Mekelle's consumers and corporate organizations. The acquired data was evaluated using both qualitative and quantitative methods, with descriptive analysis being used. As a result of various company misconducts and corporate discussions, a new type of customer has emerged who is more skeptical and critical than ever before, influencing individual choices, perceptions, and value systems. The study discovered that consumers appear to be growing more hostile to marketing, owing to marketing professionals' disregard for the ethical consequences of their actions.

Using a case study of Toyota, Ehtesham and Kuchey (2016) investigated the impact of unethical online business practices. The study was to determine the impact of Toyota's unethical behaviors on stakeholders. The study found that people lost trust in Toyota vehicles as a result of Toyota's lack of safety knowledge, and they went for other vehicles. As a result, Toyota's brand reputation suffered. Toyota automobile sales in the United States declined 16% in January 2010 and 8.7% in February compared to the same months in 2009. In addition, a lack of openness and a refusal to work with the regulatory body created a sense of uneasiness among their stakeholders, particularly their customers and suppliers.

We therefore find that for both individuals customers and organizations, unethical behavior has serious consequences. It can result in job loss and reputation loss, organizations losing credibility, general morale and productivity declining, or significant fines and/or financial loss. One of the most serious consequences of unethical behavior in business is the inability of a company to form or maintain long-term relationships with customers. Furthermore, it becomes vulnerable to lengthy and costly legal proceedings.

2.1.4 Prevention of Unethical Practices on Online Business

Given the rapid expansion and developing trend of e-commerce, which has changed consumer preferences to purchase online, Chawla and Kumar's (2021) examined the increasing trend of E-commerce and consumer protection in India. The study examined the current Indian legislative framework that protects the interests of online customers. A thorough examination of the two recently adopted regulations, namely the Consumer Protection Act of 2019 and the Consumer Protection (E-commerce) Rules of 2020, as well as a literature study, assist an analysis of 290 online customers in answering research questions and fulfilling research objectives. The key results are that a safe and dependable system is required for e-business businesses to operate successfully; cash on delivery is the preferred method of payment for online purchases; and website information and effective customer care services develop a client's trust. The new restrictions appear to be robust enough to defend and secure the rights of online customers while also boosting India's e-commerce boom. Aside from security, privacy, warranty, customer service, and website information, consumer rights protection laws in e-commerce influence customers' trust (Ishan & Alam, 2019).

Within the construction industry in United Kingdom (UK), Shah and Alotaibi (2018) conducted research on unethical practices and potential prevention methods. The survey was conducted to gather the perspectives of key stakeholders from various impacted parties on the concept of business ethics in the building and construction industry, which has a substantial impact on rising countries' national economic growth. According to the study, avoiding conflicts of interest and promoting ethical rules to experts will assist to restore investor and public confidence, client trust, and improve the quality of buildings and infrastructures.

In SA, research into ethical business practices with regard to consumer protection Act and socioeconomic transformation in South Africa was carried out by Reddy and Rampersad's (2019). They examined specific Act sections, with a focus on the role of business in transformation in terms of consumer protection, including the importance of plain and understandable language in contracts. In terms of consumer rights, the study used a descriptive approach to illustrate business's social responsibilities in a changing society. The Consumer Protection Act (CPA) 68 of 2008, which went into force in South Africa on 1 April 2011, establishes the foundation for consumer protection in the country and is the first of its type. It supports a fair and open market for consumer goods and services. It also establishes ethical principles and national standards for consumer protection.

Moreover, in Kenya, study by Muriuki and Mathenge (2019) investigated relationship between business ethics and market share of tier one deposit taking SACCOs in Nairobi County, Kenya. Using a descriptive research approach, the study targeted 294 management personnel from various functional areas, yielding a sample size of 147 respondents (equal to 50% of the population) drawn from Nairobi's 12 Tier 1 SACCOs. According to the study, ethical policies had the greatest impact on market share, with a direct, robust, and statistically significant effect, followed by discrepancy measures. Although the association with market share was statistically significant for each category, ethics programs and codes of conduct had the least influence on market share. It was suggested that SACCOs pledge to be truthful, honest, and prompt in all disclosures and external reporting. They should commit to not allowing criminal acts like as corruption, theft, fraud, and uncompetitive activity, as well as activities that are in direct violation of organizational policies, and to monitoring any such activities.

2.2 Findings of this study

Based on the research objectives, this study's findings are that: the nature and types of unethical practices that includes, insecurity, mistrust and unreliability in product and service provision negatively affects the successful online business transaction. Unethical practices are caused by a variety of issues, including peer pressure, poor management modeling, and so on. In both individuals and organizations, unethical behavior has serious consequences. It can result in job loss and reputation loss, organizations losing credibility, general morale and productivity declining, or significant fines and/or financial loss. A safe and dependable system is required for e-business businesses to operate successfully, avoiding conflicts of interest and promoting ethical rules to experts will assist to restore investor and public confidence, client trust and so on.

2.3 Research Gaps and Further Research

This paper aimed at reviewing and identifying research gaps in both theoretical and empirical literature related to unethical practices and online business: a perspective of DSMM users. The study has revealed that there are quite a number of published studies in relation to the influence of unethical practices on online business. However, none of the studies looked at how unethical practices on online business particularly on DSMM users. This is in answer to Rowley and Keegan, (2019) observation on the need for the inclusion of further research on both (1) social media practice and strategy, and (2) social media consumer behavior. Felix et al., (2017) also argue that 'extant marketing research does not analyze social media marketing from an overarching, holistic perspective (where management, employees and customers share notions of their respective roles). Indeed, Quinton (2013, p.913) suggests that with the advent of social media, the linear, relational exchange-based partnership model of business-customer interaction needs to be replaced with a more interactional orientation with a focus on multi-layered and multi-faceted interactions that cross venues and media, and emphasizes multifaceted relationships (Dwivedi, 2021).

Given that the majority of studies examining the relationship between unethical practices and online business were conducted primarily in developed countries with a few exceptions in Africa. Google's approach to SEO in 2019 is by focusing on three big areas, a) the shift from answers to journeys, b) the shift from queries to providing a query-less way to obtain information, and c) the shift from text to voice and a more visual option of finding information (Dwivedi, 2021). Given this situation, then the question is what strategies can marketers use to develop metrics and scales for consumer protection in the DSMM implementation? Therefore, the study suggests that further studies should be carried out that focus on other aspects of unethical practices. Some of the research questions that may have some practical implication for the marketers include: how marketers build trust for their brands in the social media marketing platforms. In addition, further studies can be done that focus on a different perspective apart from DSMM users.

Conclusion

This research paper focused on how unethical practices influence online businesses with the aim of establishing gaps in various aspects either from the contextual, theoretical and methodological point of view. The study reaches to a conclusion that many businesses have a weak ethical culture, and little progress has been achieved to reduce misconduct. The unethical practices are insecurity, mistrust, unreliability in products and services and deception that affect negatively and significantly the online business transactions. The DSMM users tend to be affected by these unethical practices in a number of ways that include loss of customer loyalty, unsatisfied customers and loss of business reputation. Also, the study concluded that the Consumer Protection Act has a far-reaching impact on business; that business has a significant role to play in consumer protection and the transformation of a historically disadvantaged society; and that the law does play a role in putting pressure on businesses to act in a socially responsible manner. It is therefore urgent and very important for researchers to carry out other studies that focus on the unethical practices in DSMM transactions.

References

- Agag, G., 2019. E-commerce ethics and its impact on buyer repurchase intentions and loyalty: An empirical study of small and medium Egyptian businesses. *Journal of Business Ethics*, 154(2), pp.389-410.
- Alakeel, A.S., Impact of Behavioral Ethics of Online Stores on Consumers' Behavioral Intention in Saudi Arabia.
- Al-Alawi, A.I., Mehrotra, A.A., Elias, H., Safdar, H.S. and Al-Bassam, S.A., 2021. The Implications of Unethical and Illegal Behavior in the World of E-Commerce. In *Research Anthology on E-Commerce Adoption, Models, and Applications for Modern Business* (pp. 1656-1719). IGI Global.
- Al-Saggaf, Y., Burmeister, O. and Weckert, J., 2015. Reasons behind unethical behaviour in the Australian ICT workplace: An empirical investigation. *Journal of Information, Communication and Ethics in Society*.
- Ayuba, B. and Aliyu, I.A., 2018. Unethical business practices in Nigeria: Causes, consequences and control. *International Review of Business Research Papers*, 14(2), pp.1-231.
- Bellé, N. and Cantarelli, P., 2017. What causes unethical behavior? A meta-analysis to set an agenda for public administration research. *Public Administration Review*, 77(3), pp.327-339.
- Blackston, M., 2000. Observations: Building brand equity by managing the brand's relationships. *Journal of Advertising Research*, 40(6), pp.101-105.
- Boatright, J.R., 2000. Globalization and the Ethics of Business. *Business Ethics Quarterly*, 10(1), pp.1-6.
- Bohatá, M., 1997. Business ethics in Central and Eastern Europe with special focus on the Czech Republic. *Journal of Business Ethics*, 16(14), pp.1571-1577.
- Boyd, E.A. and Bilegan, I.C., 2003. Revenue management and e-commerce. *Management science*, 49(10), pp.1363-1386.
- Buckner, H.T., 1965. A theory of rumor transmission. *Public Opinion Quarterly*, 29(1), pp.54-70.
- Chaffey, D., Edmundson-Bird, D. and Hemphill, T., 2019. *Digital business and e-commerce management*. Pearson UK.
- Chawla, N. and Kumar, B., 2022. E-commerce and consumer protection in India: the emerging trend. *Journal of Business Ethics*, 180(2), pp.581-604.
- Connor, T., 1999. Customer-led and market-oriented: a matter of balance. *Strategic management journal*, 20(12), pp.1157-1163.
- Contractor, N., 2009. The emergence of multidimensional networks. *Journal of Computer-Mediated Communication*, 14(3), pp.743-747.
- Cragan, J.F. and Shields, D.C., 1998. Understanding Communication Theory the Communicative Forces for Human Action.
- Dwivedi, Y.K., Ismagilova, E., Hughes, D.L., Carlson, J., Filieri, R., Jacobson, J., Jain, V., Karjaluoto, H., Kefi, H., Krishen, A.S. and Kumar, V., 2021. Setting the future of digital and social media marketing research: Perspectives and research propositions. *International Journal of Information Management*, 59, p.102168.
- Ehtesham, U. and Kuchey, A.A., 2016. Impact of unethical practice on business environment: a case study of Toyota. *International journal of Marketing and Financial Management*, 4(5), pp.11-17.
- Felix, R., Rauschnabel, P.A. and Hinsch, C., 2017. Elements of strategic social media marketing: A holistic framework. *Journal of Business Research*, 70, pp.118-126.
- Flanagin, A.J., 2007. Commercial markets as communication markets: Uncertainty reduction through mediated information exchange in online auctions. *New Media & Society*, 9(3), pp.401-423.
- Flavián, C. and Guinalíu, M., 2006. Consumer trust, perceived security and privacy policy: three basic elements of loyalty to a web site. *Industrial management & data Systems*.
- Alfonso, G.H. and Suzanne, S., 2008. Crisis communications management on the web: how internet-based technologies are changing the way public relations professionals handle business crises. *Journal of contingencies and crisis management*, 16(3), pp.143-153.
- Griffin, E.M., 2006. *A first look at communication theory*. McGraw-hill.
- Groenewald, L., 2020. Whistleblowing Management Handbook..
- Huang, Y.C., Wu, Y.C.J., Wang, Y.C. and Boulanger, N.C., 2011. Decision making in online auctions. *Management Decision*.
- Hussain, A., Shahzad, A., Hassan, R. and Doski, S.A., 2021. COVID-19 impact on B2B e-commerce: A multi-group analysis of sports and surgical SME's. *Pakistan Journal of Commerce and Social Sciences (PJCSS)*, 15(1), pp.166-195.

- ISHAN, Z.M. and ALAM, S.M.N., 2009. Unconscionability—Statutory Prevention of Unethical Business Practices. *International Journal of Economics and Management*, 3(1), pp.151-169.
- Kaptein, M., 2011. Understanding unethical behavior by unraveling ethical culture. *Human relations*, 64(6), pp.843-869.
- Kim, A.J. and Ko, E., 2012. Do social media marketing activities enhance customer equity? An empirical study of luxury fashion brand. *Journal of Business research*, 65(10), pp.1480-1486.
- Logsdon, J.M. and Patterson, K.D., 2009. Deception in business networks: Is it easier to lie online?. *Journal of business ethics*, 90(4), pp.537-549.
- Logsdon, J.M. and Patterson, K.D., 2009. Deception in business networks: Is it easier to lie online?. *Journal of business ethics*, 90(4), pp.537-549.
- Lu, Y., Papagiannidis, S. and Alamanos, E., 2018. Internet of Things: A systematic review of the business literature from the user and organisational perspectives. *Technological Forecasting and Social Change*, 136, pp.285-297.
- Marom, S., 2017. Social responsibility and crowdfunding businesses: a measurement development study. *Social Responsibility Journal*.
- Martin, D.E., 2012. Culture and unethical conduct: Understanding the impact of individualism and collectivism on actual plagiarism. *Management Learning*, 43(3), pp.261-273.
- Hjarvard, S., 2013. *The mediatization of culture and society*. Routledge.
- Milberg, S.J., Smith, H.J. and Burke, S.J., 2000. Information privacy: Corporate management and national regulation. *Organization science*, 11(1), pp.35-57.
- Modi, V. and Sharma, P., 2021. INDIAN CUSTOMERS' PERCEPTION & REACTION TO DECEPTIVE ADVERTISEMENTS OF HAIR CARE PRODUCTS. *GAP INTERDISCIPLINARITIES-A GLOBAL JOURNAL OF INTERDISCIPLINARY STUDIES*, 4(1), pp.49-62.
- Muriuki, E.N. and Mathenge, F., P. (2019). *Business ethics and market share of tier one deposit taking SACCOs in Nairobi County, Kenya. The Strategic Journal of Business & Change Management*, 6(3), pp.746-761.
- Muriuki, E.N. and Mathenge, F., P. (2019). *Business ethics and market share of tier one deposit taking SACCOs in Nairobi County, Kenya. The Strategic Journal of Business & Change Management*, 6(3), pp.746-761.
- Mwangi, K., 2019. *An Investigation Into Ethics Management Amongst Contractors In Kenya—A Case Study Of Nairobi County* (Doctoral dissertation, UoN).
- Nardal, S. and Sahin, A., 2011. Ethical issues in e-commerce on the basis of online retailing. *Journal of Social Sciences*, 7(2), p.190.
- Nardal, S. and Sahin, A., 2011. Ethical issues in e-commerce on the basis of online retailing. *Journal of Social Sciences*, 7(2), p.190.
- Negassa, G.J., 2015. The effects of business ethics on consumers' perceptions of merchandizing and service giving businesses in Mekelle, Ethiopia. *International Journal of Scientific and Research Publications*, 547.
- Ogundele, O.J.K., Hassan, A.R., Idris, A.A. and Aliu, A.A., 2013. Ethical Problems affecting SMEs in Nigeria, and their impact on E-Business Development. *International Journal of Economics and Management Sciences*, 2(13), pp.1-15.
- Parr, B., 2009. 10 Most Extraordinary Twitter Updates.
- Pinker, E.J., Seidmann, A. and Vakrat, Y., 2003. Managing online auctions: Current business and research issues. *Management science*, 49(11), pp.1457-1484.
- Quinton, S., 2013. The community brand paradigm: A response to brand management's dilemma in the digital era. *Journal of marketing management*, 29(7-8), pp.912-932.
- Karunanidhi, R. and Renitha, R., 2012. Ethical business practices: The consumer protection act and socio-economic transformation in South Africa. *African Journal of Business Management*, 6(25), pp.7403-7413.
- Remišová, A., Lašáková, A. and Bohinská, A., 2019. Reasons of unethical business practices in Slovakia: The perspective of non-governmental organizations' representatives. *Acta Universitatis Agriculturae Et Silviculturae Mendelianae Brunensis*, 67(2), pp.565-581.

The Influence of TikTok on Young Generation in Vietnam

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Abstract: The Internet and its growth throughout these near decades have been unbelievable. Especially social media platforms such as Twitter, Facebook, Snapchat, or in this case, TikTok has out-grown some of the mainstream media like television, radio, or newspaper. TikTok is a multinational social media platform that mainly focuses on short clips and videos, which is open for anyone to post on the platform, somewhat like YouTube. TikTok videos vary from entertainment, sport, informational, fashion or even cooking videos. The platform allows their videos to spread to all continents, leading to the spreading quickly of any “viral” video. At first sign, the platform seems to be an entertainment platform with no age restriction, due to the claim of the content restriction policy of TikTok. However, there are some downsides to this social media platform that people are slowly coming to realize, and these downsides are affecting the younger generation who use this platform almost every day. This research examines both positive and negative aspects of this social platform and the effects which it has on the younger generation in Vietnam. The research uses both qualitative and quantitative methods, which contain a list of questionnaires and open-ended questions. The purpose of the research is to make clear the influence of TikTok on the youth of Vietnam, which helps to form an opinion on whether the application is suitable for this generation.

Keywords: TikTok, entertainment, #learnontikTok, TikTok influences on teenager

1. Introduction

With the development of technology in the current era, the number of people who invest their time on the Internet is rapidly increasing. In the meantime, there are plenty of social media platforms that grow and become well-known all around the globe, such as Facebook, Twitter, Snapchat, Instagram, TikTok... Presently, TikTok is undoubtedly one of, if not the biggest, social media in the world, and the majority of users of this platform are teenagers. In 2022, TikTok reached 1.534 billion users, of which 1.5 billion are actively using the application (Ruby. D, 2023). In this study, we discuss Vietnam which is one region containing plenty of TikTok users... The amount of Vietnamese TikTok users reached almost 28 million in 2022 (Shaun, 2022). On TikTok, the speed of information spreading is fast, and is able to reach millions of users at the same time. Therefore, millions of teenagers from the age of 15 and above spend 91 minutes a day on average on this application, while only spending 51 minutes watching Youtube daily (Perez, S. 2022). Thus, there is a great chance that one video can go viral within an hour of posting, it creates a wave of shooting and posting TikTok videos. A video of TikTok is in a form of a short video, from 30 seconds to 3 minutes max. With a system like this, TikTok encourages more and more people to post on their platform with the hope of becoming viral. TikTok content is not restricted in any area. It can be entertainment, sport, informational, fashion, news, or cooking videos. The platform allows anyone to post and create their own page to gather attention from others. Although TikTok has plenty of benefits for its users, negative aspects of TikTok exist within the application, which will be discussed in this paper.

In this research paper, both positive and negative aspects of TikTok will be discussed, especially the benefit and downsides of it for the younger generation in Vietnam. The first part of this paper will contain the literature review, which reviews the benefits of TikTok, along with the potential harm that the platform might have on a teenager. The main source of data that is used in this section will be collecting using online resources and also the main TikTok platform. Secondly, the paper will describe the method used to collect data from users in Vietnam, mainly students and teenagers who use the app daily. Thirdly, the data gathering will be analyzed, and the matter of TikTok underlying negative effect that TikTok has on teenagers will be discussed. And lastly, the conclusion will be reached as to whether the app is suitable for this generation of Vietnamese youngsters. The purpose of this research is to clarify the beneficial and potentially negative aspects of TikTok. There are always two sides to the coin. If TikTok still attracts more teenagers to use the application daily, there must be a positive aspect, but also a downside of it.

2. Literature review

2.1 Informative and socialization

The fact that the Internet developed far enough for anyone to sit at home and know, see, and judge everything and every matter in the world through a personal device is proof that humans have gone a long way. TikTok, an application that people use to watch short video contain plenty of content, which also contain news and information across the globe. According to Al-Marouf, et al (2021), TikTok was created solely for socialization and self-expression. This is one of the brightest aspects of TikTok where a teenager can see what is happening around them, and also express themselves through TikTok. Traditional television and newspaper have now become boring and too formal for youngsters to watch and read. Instead, they use TikTok to gather their information and news about the world. According to Newman, N. (2022), by changing the platform and enabling longer videos, TikTok has become more attractive for news-publisher to engage the younger audience. Also, TikTok has a comments section where people can come and give their opinion on the matter, unlike Television or newspapers. Therefore, more and more people are using TikTok as their source of gathering information. A study from the past shows that seeking and spreading information is one of the factors why people continue using TikTok (Falgoust, et al. 2022). Blended in with some videos about food and dogs, there will be a video about news on some matter that might interest someone. This way, the user gets to choose what they want to hear or watch by simply scrolling TikTok in their free time and still manage to gain the information that they are interested in.

2.2 #LearnOnTikToks

According to the report of Seaman and Tinti-Kane (2013), using social media in teaching increases the reach and communication between the lecturer and the student. Thus, social media awareness was extraordinarily high, and personal usage of social media swiftly followed in great numbers. The tag is a feature that TikTok has provided for users to search easier and leads directly to the section of content that users want to watch. When searching in TikTok, a tag name such as #LearnOnTikTok or #EduTikTok is a great way for students to search, watch and learn at the same time on the platform. With this feature, TikTok creates an opportunity for teachers and students to both create and watch the educational content within the application. Some of the research shows that school and university supervisors are taking advantage of this feature since their students can search for professional education knowledge on TikTok. As stated in the research of Bexheti, Ismaili, and Cico (2014), social media platforms provide students with free access to a vast array of instructional materials. Furthermore, it supports teaching and learning process. Therefore, some lecturers who specialize in the field will create and post content about education to reach the student more easily. In addition, there are also contained within the tag #LearnOnTikTok, which is another knowledge and experience video that students can watch and learn from.

These kinds of videos are not made by lecturers or professionals; however, they contain information that can help to develop the knowledge of students and teenagers that search for the tag. People are more positive about social media learning cooperation because it provides a more engaging atmosphere and stimulates them to engage in knowledge-related events (Sharabati, et. al,2022).

The education aspect of TikTok is great for both video makers and audiences. The audience gets what they came for, and the video maker gets the attention from the video. If one of the videos goes viral, plenty will see and comment on the matter and make it even more well-spread through the platform. In the previous study of Fiallos et. al (2021), they stated that TikTok is a platform that provides a youthful and worldwide audience with access to a new format of short instructional films developed by experienced writers, in addition to amusing videos. The research also supports “#learnonTikTok” and supports the idea of developing this domain of TikTok to help the younger generation to have a new tool to study and learn from.

However, there is also a downside to this. Some students do not enjoy studying in class, so they take this as a replacement and not paying any attention in class. Also, watching these videos is great for developing knowledge, but the amount of false information and the authenticity of the information is still not checked. Some teenagers might see some video about “false knowledge” and believe in it without double checking on the matter. One of the issues with major social media sites like Facebook, Reddit, and TikTok is a lack of scientific control, which leads to noise and incorrect information (Egtesadi & Florea, 2020). For example, the matter of a flat earth has been spread through the internet and it got many people to believe in it. Which makes it a new trend that many people discuss and argue about. This is false information that someone creates in the matter

of getting attention from the Internet, and it works. Therefore, despite the great value that TikTok education systems benefit the youth, it has its downside and might damage the youth in some way.

2.3 Entertainment

According to Wei, B (2023), the perfect TikTok is considered a wonderful music decoration. TikTok creates a great platform for people to entertain themselves in their free time. The application, consisting of short videos and content from all around the world, makes it great for people to enjoy the time they have. One of the most successful functions that make TikTok great is the ability to remember and analyze the user's favorite content and send the same format of video to that user to continue watching. Furthermore, if the user is watching the content of some creator repeatedly, the platform will keep recommending the same creator's content for that user to keep them entertained while using the application. According to Sharabati, et.al (2022), escape, relaxation, and amusement appear to be more prominent on TikTok than on other social media platforms. People use TikTok in their free time to give themselves a glimpse of stepping away from their duty and responsibility. TikTok content varies in plenty of areas, which fits everyone's taste for entertainment. Therefore, teenagers are using TikTok in their free time to entertain themselves. This will also encourage a youngster to create and make content similar to their interest. However, some youngsters can just copy and recreate the original viral video that they saw. This is due to the fact that anyone can become famous on TikTok with just one viral video. Success comes as soon as the video went viral, therefore, there are plenty of people just using the same video format and the idea of some video that is already viral and replicating it to gain fame from the original idea. This is also easier to gain views and likes on TikTok due to its system of recommending videos to the viewer, which recommends the video similar to what users have liked or watched. TikTok makes youth think that it's easy to earn money and fame, leading to the reality of copying and stealing ideas from each other rather than creating their own content. Since it is easy to upload a video on TikTok, the problem will carry on and lessen people's ability to innovate and be creative, hoping for quick money and fame. This helps the organization to gain more video quantity on their platform but decreases the quality of video on TikTok. This also creates a new problem in the region of Vietnam, where many teenagers invest their time and money in making TikTok videos, and the quality of the content is repeated, or some will choose to get attention through hate. Any controversial argument on TikTok will get attention and comment in the comment section. The more controversial, the more comment it will get. This is one of the ways to get attention and fame on TikTok and it became a problem in Vietnam. The most recent one is the "TikToker" named 'No O No' in Vietnam, who uses charity food as a cover to verbally shame poor people and make content out of it. This is one of the biggest downsides of TikTok, where people do not care about morality, they just do everything for the money. This is a prime example of how TikTok might damage the youth, not only in Vietnam but also in the world.

Even though the application is great for creating content and entertainment, there are some individuals posting inappropriate videos on TikTok, which is harmful to children and teenagers who scroll into those videos. The research of Jaffar, et al (2019), stated that the recommending feature of the application does not have any age restriction, which means any type of video can reach and show to users from any range of age. Also, the paper stated that the application has been described as "offensive and toxic". Thus, the research shows that some of the videos are coming from individuals, who are quoted as "older men and creeps" who create content that is inappropriate for children and respond inappropriately in some women's video comment sections. Another paper from Oktarini, et al. (2022), listed sexual harassment as the biggest negative impact that TikTok has. These are some of the problems that TikTok has that could harm the next generation.

3. Methodology

In this section, the paper uses both quantitative and qualitative approaches. A survey will be conducted based on the main question of the paper, which is "Will TikTok benefit you or damage you?". The survey is conducted using Google Forms to fulfill the geographic matter of participants. At the end of the survey, there will be some open-ended questions for participants to express their own opinions on the matter and give a deeper understanding of the matter. The survey is conducted in the region of Vietnam, and the participant are consisting of teenagers from the age of 15-25 years of age, who are regularly using TikTok on a daily. The participant is informed about the possibility of publication of the research, and the information they provided will be used in this paper.

4. Result and Discussion

The age of participant that are included in this paper is vary from age of 15–25-years-old. The total number of participants is 70, consisting of 35 male and 35 female teenagers, all from the region of Vietnam. The majority of participant are high school students and college students, which is 63 out of 70. Only 7 participants are youngsters that have finished school.

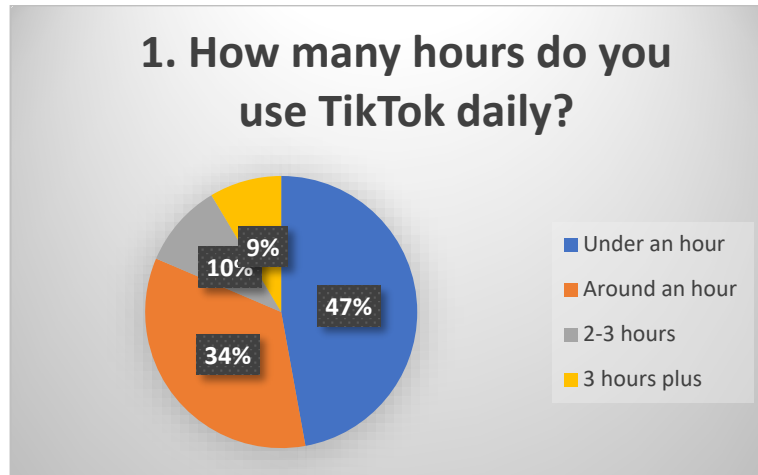


Figure 1

Most of the participant use the app under and around an hour on a daily basis, with the percentage of 47% for under an hour and 34% for around an hour. Only 9% are using the application for more than 3 hours and 10% of them are from 2 to 3 hour. This group is all college student, where they state that they have plenty of free time on their hands.

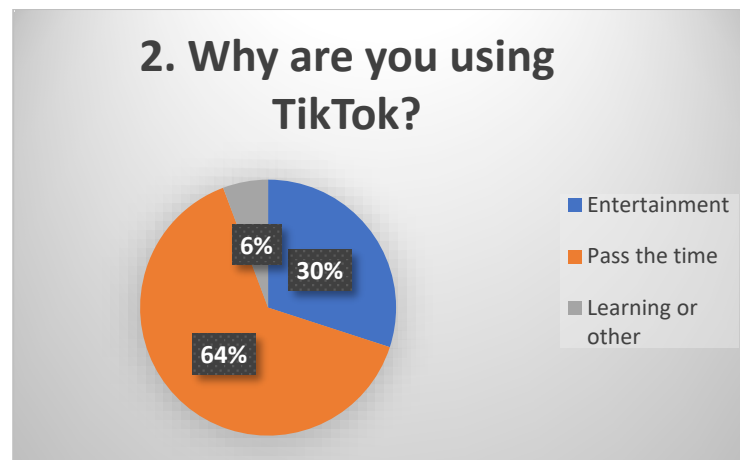


Figure 2

The reason that most participants state that they are using the application is to pass the time, which at 64%. 30% of them are using TikTok for entertainment purposed. Only 6% of participant are using the app for learning and other purposes.

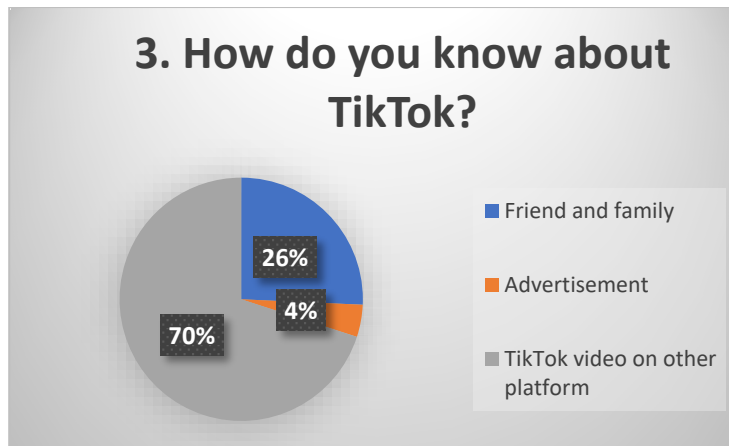


Figure 3

Most people stated that they know about TikTok through different platfos such as Facebook or Instagram (70%). 26 % of them say they know about it from a friend or family member, and only 4% know about the platform through advertising.

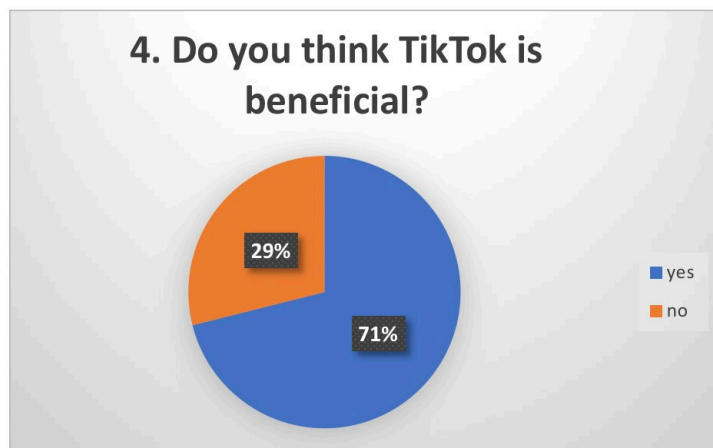


Figure 4

In this question, 71% of people agree that TikTok is beneficial for them. On the other hand, 29% disagree with the statement.

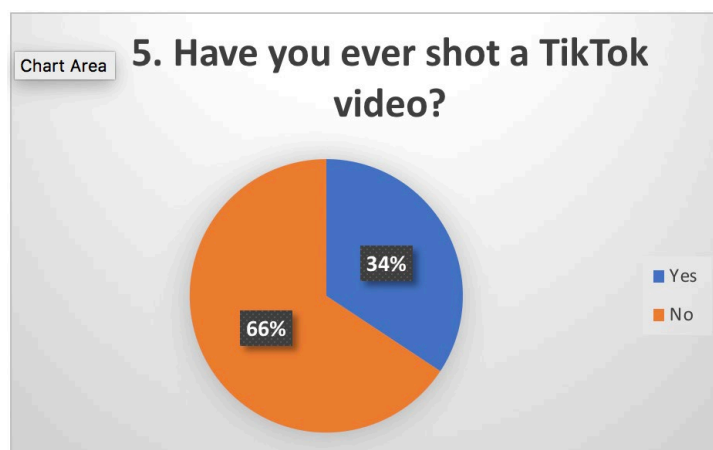


Figure 5

On TikTok, there are various trends from time to time. 66% of people have tried to make a video and post it on TikTok, and 34% of them have not.



Figure 6

Out of 46 participant that have make a TikTok video, the majority of them stated that they are doing the video for fun (63%). Others motive like money or attention is at 13% and 9%. The remaining 15% of participants said that they are doing it like a form of social media post, a memory almost.

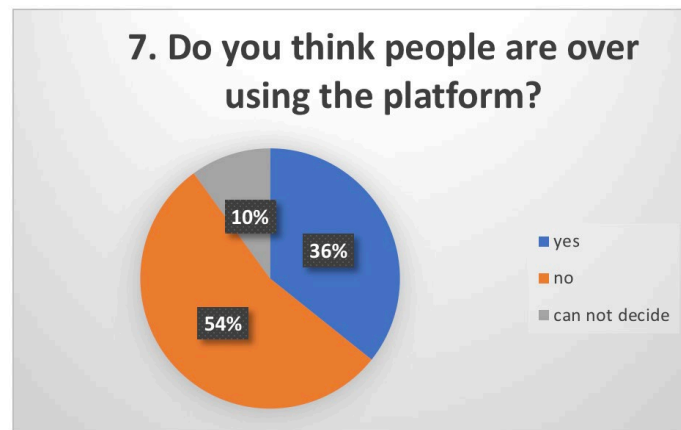


Figure 7

When asked about the matter of overusing the application, 36% of people agree that some people are overusing the app, while 54% did not agree. 10% of the participants could not decide.

When asked about the matter of harmful content, most of the participants agree that some content on TikTok is harmful to the youth, while 18% reject the matter. Only 6% of participants cannot decide whether the content is harmful or not.

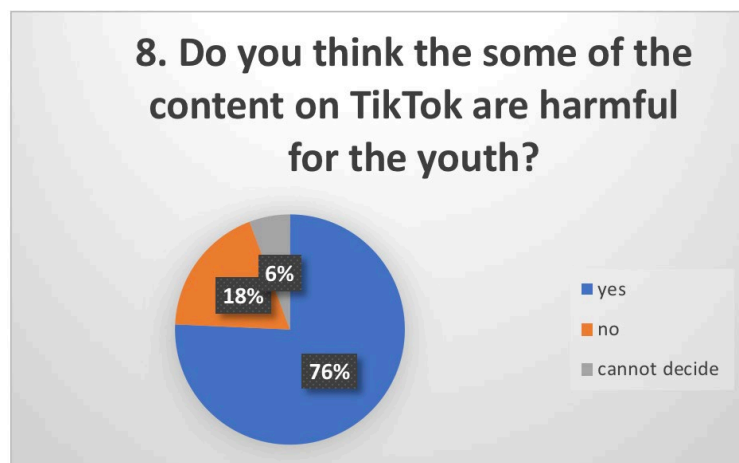


Figure 8

The following part of the survey is open-ended questions, which help gather deeper information to gain a better understanding of the problem. The main point of these questions is focused on answering the question “Is TikTok more beneficial or more harmful?”. Most of the answers are united on TikTok having more benefit than harm. The reason for this that participants provide is that it is the best way to pass on time, the best way to entertain them, and TikTok provides them with information and knowledge from everywhere. However, some participants comment on this matter differently. One of the participants, ‘Mr.Giang’ share that there is a harmful way of using this app, which is getting addicted to it. He shares that his friend is addicted to TikTok and watches it all night and sleeps in daylight, which leads to a lack of studying and sleep. Another female participant stated that TikTok does not have any sensitive verbal content restrictions. Some “influencer” in Vietnam is spreading negative comment and thought on the sensitive subject because these subjects will gather more view. Although the opinion of these “influencers” does not violate any TikTok policy, it gives a negative effect on teenager mind and thought. This type of content needs to be supervised by the parent of teenagers, so they can see what their children have been watching and explain to them if there is any false or negative information being stated.

5. Conclusion

In conclusion, as a social media platform, TikTok has brought plenty of benefits to the youth and teenagers of Vietnam. It creates social media that plenty of youngsters found entertaining and useful for educational and informative purposes. Thus, the media is useful for youngster to express themselves and show their talents and skills in some fields. Plenty young individuals have and are becoming famous on the platform, gaining large amount of viewer by creating content, some of them are even turning the view and fame on TikTok into their personal future career. However, some underlying harm needs to be stated to protect the younger generation. TikTok is no doubt the best entertainment platform in the last decade, where people can freely use and post. Thus, the platform benefits some organizations in promoting their product to a wider audience. The application still has some very concerning problems that might affect youngster mental problem and health by over-using the application. In addition, TikTok still have plenty of video content that inappropriate for young children and youth, which is sensitive content or political issue align among Vietnamese.

The impact of the application is huge, and it should consider making some changes to protect the younger generation. For instance, TikTok should require any content creator to specify their content in a different category, such as 18+ or controversial. And the audience needs to specify their age while registering for the account. This way it can prevent younger audiences from watching and seeing content that is not fit for their age. This way, parents can help supervise the content that teenagers are consuming and prevent the wrong, false and inappropriate content from their children. Furthermore, the application should have a time restriction for users that are in the age of study. This will prevent them from overusing the platform and neglecting their studying. Since TikTok is growing bigger every day, there should be a suitable guiding system to protect and develop the future generation.

Overall, even though the application have huge impact and benefit to youngster, entertainment and educational wise, it is important to understand the positive and negative aspect of the application as the children supervisor. This way we can limit the negative impact but still enhancing the positive that the application bring to our future generation in Vietnam.

Acknowledgement

The authors would like to thank **doc. Ing. Michal Pilík, Ph.D.** for his guidance.

This work is supported by the Internal Grant Agency of FaME, Tomas Bata University in Zlín
no.IGA/FaME/2023/008

Reference:

- Al-Maroofo, R. et al. (2021) “The acceptance of social media video for knowledge acquisition, sharing and application: A comparative study among YouTube users and TikTok users’ for medical purposes,” *International Journal of Data and Network Science*, pp. 197–214. Available at: <https://doi.org/10.5267/j.ijdns.2021.6.013>.
- Bellan, R. (2022) TikTok suspends content in Russia in response to 'fake news' law, *TechCrunch*. Available at: <https://techcrunch.com/2022/03/06/tiktok-suspends-content-in-russia-in-response-to-fake-news-law/>
- Bexheti, L, A., Ismaili, B. and Cico, B. (2014). An Analysis of Social Media Usage in Teaching and Learning: The case of SEEU. Paper presented at the Proceedings of the 2014 International Conference on Circuits, Systems, Signal Processing, Communications and Computers.

- Eghesadi, M. and Florea, A. (2020) "Facebook, Instagram, reddit and Tiktok: A proposal for health authorities to integrate popular social media platforms in contingency planning amid a global pandemic outbreak," *Canadian Journal of Public Health*, 111(3), pp. 389–391. Available at: <https://doi.org/10.17269/s41997-020-00343-0>.
- Fiallos, A., Fiallos, C. and Figueroa, S. (2021) "Tiktok and education: Discovering knowledge through learning videos," 2021 Eighth International Conference on eDemocracy & eGovernment (ICEDEG) [Preprint]. Available at: <https://doi.org/10.1109/icedeg52154.2021.9530988>.
- Falgoust, G. et al. (2022) "Applying the uses and gratifications theory to identify motivational factors behind young adult's participation in viral social media challenges on TikTok," *Human Factors in Healthcare*, 2, p. 100014. Available at: <https://doi.org/10.1016/j.hfh.2022.100014>.
- Jaffar, B.A., Riaz, S. and Mushtaq, A. (2019) "Living in a moment: Impact of TikTok on influencing younger generation into micro-fame," *Journal of Content, Community and Communication*, 10(9). Available at: <https://doi.org/10.31620/jccc.12.19/19>.
- Newman, N. (no date) How publishers are learning to create and distribute news on TikTok, Reuters Institute for the Study of Journalism. Available at: <https://reutersinstitute.politics.ox.ac.uk/how-publishers-are-learning-create-and-distribute-news-tiktok#header--10>
- Perez, S. (2022) Kids and teens now spend more time watching tiktok than YouTube, new data shows, TechCrunch. Available at: <https://techcrunch.com/2022/07/13/kids-and-teens-watch-more-tiktok-than-youtube-tiktok-91-minutes-in-2021-youtube-56/>
- Oktarini, N. P. U., Dewi, N. P. K., Putra, M. R. A. K., Ataupah, J. H. A., and Oktarini, N. L. D. D. (2022). Analysis of the Positive and Negative Impacts of Using Tiktok for Generation Z During Pandemic. "Journal of Digital Law and Policy". Available at: <https://www.ejournal.catuspata.com/index.php/jdlp/article/view/167>
- Ruby, D. (2023) 36 tiktok statistics 2023: How many users are there!, Demand Sage. Available at: <https://www.demandsage.com/tiktok-user-statistics/>
- Shaun (2023) Tiktok Statistics Guide, TheB2BHouse. Available at: <https://www.theb2bhouse.com/tiktok-statistics/>
- Sharabati, A.-A.A. et al. (2022) "The impact of Tiktok User Satisfaction on continuous intention to use the application," *Journal of Open Innovation: Technology, Market, and Complexity*, 8(3), p. 125. Available at: <https://doi.org/10.3390/joitmc8030125>.
- Seamen, J. and Tinti-Kane, H. (2013). Social media for teaching and learning. London: Pearson Learning Systems. Available at: <https://www.bayviewanalytics.com/reports/social-media-for-teaching-and-learning-2013-report.pdf>
- Paper presented at the Proceedings of the 2014 International Conference on Circuits, Systems, Signal Processing, Communications and Computers.
- Wei, B. (2023). Research on the Influence of Live Webcast on Teenagers' Consumption Behavior under the New Media Background. "International Journal of Education and Humanities". Vol. 6, No. 3, 2023. Available at: <https://doi.org/10.54097/ijeh.v6i3.4768>

Masters Research Papers

#VoyYVuelvo: Performances of Chilean Identity and Cultural Memory on Instagram after Nicanor Parra's Death

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Abstract: This paper examines an analysis carried out of the mediations and remediations of Nicanor Parra's image and poetry online, focusing on how digital methods can be used for qualitative analysis, their relevance for current research, as well as some ethical considerations. Nicanor Parra was a revolutionary Chilean poet, a national icon whose death in 2018 represented a significant memory site where contemporary understandings of Chilean identity can be studied. Through digital qualitative methods, I traced the use of the hashtag #nicanorparra after his death. The data was analysed using discourse analysis, both textual and visual, to properly weigh the mix of images and captions that Instagram posts offer and interpret how these 'media of memory' articulate discourses around Chilean identity and memory today. The posts constructed a figure of Parra akin to a modern prophet, whose message of "anti-ness" called on users to act on issues such as economic inequality and the impact of industrial development on the country's environment. Through Parra's poetry, digitally expressed through vernacular creativity, a collective mnemonic imagination sketches expectations for Chile, which are particularly crucial after the massive protests demanding profound political and economic change of 2019.

Key Words: Future Memory, Poetry, Identity, Chile, Nicanor Parra, Instagram

1. Introduction

On January 23rd, newspapers around the world mournfully reported the same story: Nicanor Parra, Chile's eminent poet and 'anti-poet,' had died. A quasi-immortal figure, he actively gave interviews and wrote his anti-poetry well after turning 100. He was widely considered one of the greatest poets of the twentieth century with Niall Binns naming him "the most important figure in the history of contemporary Spanish-American poetry: there is a before Parra, and an after Parra" (Binns, 2006, p. xxix).

Parra had come to symbolize something more than himself: an eco-activist, a voice for the marginalized, a professor, a subversive rebel, as well as a symbol of Chilean national identity (Gallardo, 2004; Rodríguez, 2011). The impact of his death was such that thousands took to Instagram to honour him, uploading images with the hashtag #nicanorparra, making his death a significant site of Chilean memory. These posts reveal contemporary articulations of national identity, raising a series of questions: following Parra, what do they tell us about what it means to be "anti" in present-day Chile? And how are these memory discourses staking a claim on the future of the country?

Earlier Chilean poets had written grand poems with erudite language and mystifying references. In contrast, Parra challenged the Chilean establishment and ridiculed those "gods of the Olympus" who he would bring "crashing down" (Parra, 1969). His appeal lay in his strange, self-deprecating, and disruptive anti-poetry, which employed slang-words, proverbs, and popular sayings in the ludic and dramatic rhythm of everyday speech (Binns, 2006; Peña, 2012). With his sarcastic humour and disdain for institutions and ideologies, Parra mocked convention, ridiculed religious and state institutions, and delighted in creating confusion; he was perceived as a people's poet, stating that his poetry came from the mouth of the masses themselves (Grossman, 1975). Poetry should be piercing-sharp to startle the reader and elicit a reaction- an article of first necessity, not an object of luxury or an intellectual exercise for the well-off (Parra, 1969).

How we recall Parra, a poet so important in the Chilean imaginary, is significant. The thousands of mediations and remediations of him and his anti-poetry uploaded to Instagram after his death perform and enact different identities and understandings of Chileanness, as well as conceptions of our past and expectations for our future. Identity and collective memory are on-going processes, in which individuals and communities shift and adapt their connection to the past through symbolic artefacts that keep memory alive and creating communality across space and time (Erll and Rigney, 2012). Social media posts are one form of such symbolic artefacts, as narratives of an experience at a certain moment and place in time are created, collected, and shared.

Matters of identity are especially important when we consider how multiple forces have disrupted Chile's cultural capital: colonialism, elitism and dictatorships have all undermined its symbols, rituals, and popular culture. There have been ongoing tensions between an ideal Chilean citizen and the actual population, creating a compulsion by the socio-economic elite to shut down uncivilized behaviour in order to "better" its citizens (Martín-Barbero, 1987; Donoso Fritz, 2009). And Chile's highly ideological version of neoliberalism, implemented

during Pinochet's military rule, turned Chile into one of the most unequal countries in the world, with solidarity replaced by individualism and consumerism as community ties were increasingly fragmented (Larraín, 2010).

Today Chile is a postmodern society, where identities simultaneously local, global, hybrid, individual and fragmented (Subercaseaux, 2016). As Pinochet's legacy of fear becomes distant with time a young generation of students has dared to take to the streets, demanding free and quality education for all, while a feminist movement swept the country with occupations at dozens of universities and multitudinous protests. Finally, in 2019 widespread protests ground the country to a halt, as citizens demanded radical social, environmental, and economic change. In such an atmosphere, it was especially compelling to study how Parra's legacy of resistance and critique was adopted on Instagram after his death, and what that can tell us about the country today.

1.1 Memory, Identity and Poetry Through the Lens Of Social Media

Today it is widely recognized that when we speak of identity, we refer to a process of "becoming" rather than "being" (Hall, 2000). Identities are not fully constituted and distinct, but relational and incomplete, unstable, and defined by difference; shaped and reshaped through interactions and lived experience, in constant negotiation with hegemonic discourses, cultural and institutional forces, and national, familiar and local contexts which offer degrees of resolution and coherence (Hall, 2000; Frith, 2011). National frameworks in particular continue to be relevant, especially in countries whose cultural capital and histories were ravaged by colonial rule. As an "imagined community" (Anderson, 2006) it provides shared ideas, values, histories, and beliefs, as we position ourselves and are positioned by such frameworks (Hall, 2011). And given Chile's fraught history, it is especially important to recognize different identities and accounts in relation to ideas of a national identity (Larraín, 2010). National discourses do not convey a single identity, but encompass plurality, even making "intergenerational and interethnic communication possible" (Martín-Barbero, 2006, p. 43).

Like identity, memory only becomes collective as part of a continuous process of co-creation. Memories do not exist in the physical realm but through active remembering, a process of performance rather than reproduction where some things are remembered, and others forgotten (Erll and Rigney, 2012). It is an ongoing process shaped by mediations and remediations that take the shape of symbolic artefacts, which then act as intermediaries between people, creating a sense of a common identity in space and time. Furthermore, collective memory not only reflects current anxieties, interests and ambitions; it also provides a model imagine what is to come (Schwartz, 2016). Keightley and Pickering's (2012) concept of mnemonic imagination proved key when analysing memories of the future that came up in the posts examined. These memories of the future cannot be underestimated: forgetting possible outcomes can lead to reduced criticism and action against present social order, whereas imagining new possibilities can help articulate dissatisfactions with the current state of the world (Huyssen, 2003). As users actively create messages by taking material and transforming it for their own purposes, they creatively maps what could lie ahead, confirming that "memory is work –creative work-doing or carrying out the act" (Plate and Smelik, 2015, p. 2). Instagram posts are also an example of 'mediated memories', those "enabled by technologies and objects and embedded in social and cultural context of their use" (van Dijck, 2007, p. xiv). They connect between what was and what can be, acts of both recall and projection. Studying "mediated media" such as Instagram posts as symbolic artefacts, the discourses that construct them, and the reception they engender, sheds light on how media reconfigures and shifts our relationship to the past – and to our own selves (van Dijck, 2007; Erll and Rigney, 2012).

The images and caption uploaded after Parra's death, then, are cultural artefacts, performances and representations of collective identity and memory. They are prime examples of how Internet -and social media in particular- have significantly transformed how collective memory is generated, shared, and stored, and how narratives are circulated and collected by its users (van Dijck, 2007). Social media platforms have become so intensely entwined into everyday life that they have deeply transformed how we attach meaning and significance to our collective experiences; today "networked" identities manifest and establish themselves through a range of online interactions, aiding the articulation and co-construction of who we are.

Nevertheless, specific research on Instagram in particular is lacking and has only just begun. Studies have mostly focused on the conditions of Instagram use or its technical aspects, and not enough on the significance and meanings being conveyed in the images and captions shared. An exception is Becker's (2017) examination of Instagram's potential for agency as a democratic tool of image making in Africa, as novel representations of the continent are created and circulated online, using hashtags to situate an image within a larger collective conversation. These findings echo other studies that have considered how hashtags are used by users in order to place images in wider "hashtag conversations" (Bruns and Burgess, 2011).

This highlights how social media's offers a space for views that would not have an outlet otherwise, and its potential to resist dominant accounts, which is especially significant when considered alongside the disruptive potential of poetry. Poetry alludes, rather than explains; it unsettles, making the familiar seem strange, and illuminating new possibilities for thinking about, and acting upon, the world. It connects perfectly with Parra's irony and penchant for disruption: his poetry always pointed to something different than what appeared at first glance. He recognized that a poet's mission was to help us see the familiar in surprising ways, forcing an unexpected recognition of circumstances we have grown accustomed to (Peña, 2012). By playing with his anti-poetry online, users engage in creative practices of representation and meaning making, disrupting what can be seen, said, and thought in regard to Chile's past, present and future. Aesthetic creations contribute to the construction of a collective identity (Frith, 2011). Agency thus asserts itself through the resignification that takes place, as people appropriate a poem or an image, make it theirs, and project their life and feelings on to it.

2. Methodology

Qualitative methods are appropriate for exploring identity and memory as they bring out meaning in context, uncovering people's sense-making processes and their experiences in the world at a certain moment and place in time. A constructivist epistemological position allowed me to consider the density and diversity of positions and perspectives conveyed in the posts, especially considering memory itself is a construction of reality rather than a replica of the past, constantly shaped by our need to make sense of things and by our relationship to the communities we belong to (Kearney, 2013). Furthermore, memory not only allows to make sense of our past and future experiences, but also has the capacity to subvert power and challenge convention (Keighley and Pickering, 2013).

I applied textual analysis to the posts, following McKee's (2003) framework to emphasize the social construction of a Chilean identity through the different representations that materialized, their underlying assumptions, and the sense making of the world that they uncovered. Writing about memory studies methodologies, Kearney (2013) points out that discourse analysis offers specifically rich opportunities to observe the social production of ideas and value, as different discourses challenge each other's power and authority to truth. Rose's (2012) guidelines proved especially useful regarding discourse analysis in relation to images, being mindful of what clusters of images appear; the discourses they articulate; the associations and connections between them; and the latent meanings that emerge. In spite of my familiarity with some of the images, I strived to approach the material with fresh eyes, immersing myself in the data to uncover the visible as well as the invisible. And because the project is specific to a moment and place in time, my examination of text and image also incorporated historical context. Discourses are articulated and circulated through countless texts, practices, and images, and often media does not convey a single message but conflicting interpretations and readings, making it key to connect the material with broader context and issues of power and hegemony (McKee, 2003; Fürsich, 2009). Thus, I contrast the posts with prevailing discourses regarding Chileanness, and how these are constructed and/or challenged.

Chile has Latin America's largest percentage of citizens who are active social media users (We Are Social, 2018). Instagram in particular has six million active Chilean users as of 2017, a significant amount considering a population of just over 17 million people (INE, 2017). Instagram posts yield spontaneous material, granting access to the unconscious negotiations users engage in with Parra's poetry. In fact, researchers such as Tileaga (2013) have encouraged the use of naturally occurring data (publicly available and independent of the researcher) for discourse analysis. Exploring discourses through a hashtag can give deep insight into people's reaction, attachment, and representations of an event. In terms of ethics, only publicly shared posts were studied, and my access and use fully complied with Pace and Livingston's (2005) guidelines - that the used content is easily accessible to anyone with an Instagram account, does not require a password to be accessed, is not sensitive in nature, and has no prohibitions in relation to its use on Instagram's terms and conditions. In any case, the software used to collect the posts further ensured anonymity by removing all information except image and caption.

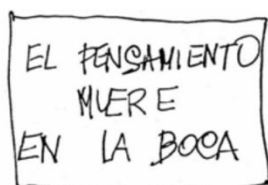
I downloaded all images uploaded to Instagram with the hashtag #NicanorParra between January 23rd and 27th of 2018. Over 10,000 posts came up - further evidence of the significance of Parra's death. To conduct a sensible analysis with a manageable amount of material, the first 300 consecutive files were considered and taken as a snapshot of a broader phenomenon. These were then coded, analysed, and categorized, in order to trace themes, and look for connections and links I might have overlooked. Using textual analysis with an emphasis on discourses and complemented by a visual methodology allowed me to question what is being said, by whom, and in what circumstances; what is being remembered, and what is not; and in short, what is constructed through

this posts and what contradictions appear and along which default lines. Through textual analysis I can arrive at “the underlying ideological and cultural assumptions of the text” (Fürsich, 2009, p.240) relate them to Chilean identity and memory and unearth how they contradict or echo hegemonic discourses around these topics.

3. “Gone But Will Come Back Soon”: Imagining New Futures

Most of the analysed posts were images of Parra and pictures of specific poems. The captions were complex and well thought out, and in many cases included long paragraphs of carefully written text. From playful farewells to Parra using wordplay, to biographical captions honouring his achievements and importance, I had a significant amount of material to sort through, and a richness of data that yielded surprising results. I will focus on how users creatively appropriated Parra’s poetry and image to imagine new possible futures and resist current conditions of inequality and environmental degradation.

Parra titled himself an anti-poet, tasked with writing anti-poetry. This was a revolutionary declaration that shocked the literary establishment and laid the foundations for his radical work. The prefix clearly resonated: the most used hashtag after #nicanorparra was #anti, and the word was playfully used in several captions, with one user referring to themselves as an “anti-adult” and another to their “anti-work”. But why was the word given such prominence? What does it mean to be “anti” in Chile today? Analysis showed that users articulated Parra’s “anti-ness” as conferring upon him an otherworldly or divine status, constructing the image of a mythical figure, a Chilean Jesus or Zarathustra. Users described Parra as “immortal”, “the great one”, “eternal”. One posts simply thanks him for “leaving us mortals so much”, while others described Parra as a “light” and wished him a “good return to the source”. The emoji of hands in prayer was repeatedly used, as people ask Parra “take me with you”. Some wrote that “Latin American poetry ends with you”, and “I don’t know who will mourn you more, poetry or anti-poetry”. Many highlighted what Parra “taught” them: to value their roots, to see new things, to love poetry. One caption reads: “Until forever #DonNica: your #antipoetry taught us to be creatives, rebels, and irreverent. Today, your legacy takes flight forever”.



“As people have been saying, it was the only thing that was missing for Mr Nicanor to be immortal. A great one
#nicanorparra
#chileansbelike#CL”



“Poets die everyday: anti-poets die once every geological era. The reason is simple: poets have always existed and will always exist; anti-poets there has only been one, Nicanor Parra.
#readforever
#nicanorparra”

Figure 1. Post #115.

Figure 2. Post #46.

Parra’s anti-poetry was radical and unsettling, permeated with scepticism, irony and the will to dismantle everything seen as proper or correct, and exposing an alienated world bursting with contradictions. The posts reproduce that challenging and confrontational attitude, symbolically appropriating antipoetry to criticize and oppose, while painting Parra as the bearer of the message. A frequently reposted illustration shows Parra with an impish grin, lifting the middle finger of each hand while being raised up by two naked female angels. Under the trio, the words of Parra’s famous artefact: “Cry if you like, I, for one, die of laughter”.



Figure 3. Posts #172, #180, #184, #241, #247, #285, #286

But what is most significant is what this spirit of anti-ness, this mythical poet, calls on people to do, with two issues coming up repeatedly. The first refers to inequality. Although Chile is pitched to the world as an economic

champion, a developed country, where people travel, shop and spend, the posts shatter the illusion of wellness, exposing a society obsessed with comfort and consumerism but oblivious to the growing wealth gap. As Larraín points out, most people don't have minimum certainties regarding their education, their housing or health, living in dire insecurity with regards to the future (Larraín, 2010, p.18). This contradiction was strongly emphasized in the posts through the use of verses such as "The poor man takes his drink / To compensate for debts / that can not be paid / With tears or strikes", or the famous quote "There are two loaves of bread. You eat two. I eat none. Average consumption: one bread per person". The second issue that came up repeatedly referred to people's concerns regarding the impact of economic progress on the environments and local ecosystems. Again, a handful of verses echoed as a mantra: "Childhood memories: the trees were not yet shaped like furniture and the chickens roamed raw around the landscape" or "The mistake was to believe that the Earth was ours, when the truth is that we are of the Earth".



Figure 4. Post #25.

"Why were we born as men! If they give us a death of animals... poetical acts must also contain politics #nicanorparra"



"It's hard to believe how strongly we try to separate ourselves from nature, when we are a tiny part of it, and we should act accordingly #nicanorparra"

Figure 5. Post #109

Parra's "anti-ness", then, allowed for new discourses, critical of current state of things. This supports Bleiker's (2012) vision of poetry as a vehicle for political reflexion and criticism, with Parra's poetry used to create awareness surrounding issues that had remained hidden or silenced, actively demand better life conditions, deep changes to the economic order, and more protection for the environment. As van Dijk (2009) would have it, it is an active engagement, an expression of user agency through new media (i.e., Instagram), as audiences demand the right to actively participate in content-creation.

In fact, the posts collectively construct a memory that projects itself into the future, not the past. Anti-poems were intended to destruct the status quo, unmasking and demystifying decrepit institutions such as state and church (Binns, 2006). As Parra himself said, the ultimate purpose of the anti-poet was to make the foundations of out-dated and obsolete institutions jump in the air (Parra and Neruda, 1962) and the anti-poem was meant to be the tip of a needle, pricking a balloon that is about to burst (Benedetti, 1972). A post quotes Parra: "I don't see the reason for such a fuss: we already know the world is over". This criticism is framed as engendering successive cycles of creation and destruction: anti-ness as a force and agent of change. Once the "demolition" is complete, there is nothing left to do but build from the ruins and imagine a new tomorrow. It makes sense that in moments of turmoil, when what we knew no longer can be trusted or relied on, people will look to the future for answers. This applies particularly to national identities, which are re-evaluated in times of crisis (Larraín, 2010). When users take on an "anti" stance, rallying against current problems, new discourses regarding the construction of novel futures can emerge. After all, identities are shaped through a narrative, which is animated by an ideal of who we want *to be* (Frith, 1996, p.122).

It is as if Parra had entrusted a mission or a mandate: a user says "remember Chilean friends what Parra has asked" and another wonders "Don Nica, how do you think art can construct Chile's history?". The majority of posts use the future or conditional tense: "I will", "let's make him live", "he will", and the idea of "tomorrow" comes up repeatedly, with one heavily referenced verse saying "Tomorrow is all we have left: / I raise my glass / To that day that never arrives / But which is the only thing / That we really have". Additionally, the theme of the future appears in remediations of Parra's poem in which the words "gone, but will come back soon", a commonly used expression, appear over an empty cross. Phrases such as "once you said 'voy y vuelvo': I hope you come back"; "come back whenever you want, don Nicanor"; or "don #NicanorParra you may go, but come back soon!". These posts manifest how users are hoping for a better future, to be realized as they wait for Parra to "come back". One person writes "#NicanorParra has died, the only poet I have seriously read and enjoyed. Read him, my God, you still have time".

The question is, time for what? What is coming, or what will happen, that makes it necessary for us to read Parra? These considerations lead back to the power of the mnemonic imagination, which through a range of practices and processes "allow us to generate transformative accounts of the past that challenge and resists institutionalised versions of historical events or processes and provide the basis for social action in the present"

(Keighley and Pickering, 2012, p.58). Although Chileans lived in fear for many years – even long after the dictatorship was over- it seems that the memory of Parra is calling on people to demand, to protest, to occupy. In fact, many posts directly referenced protests, using pictures in which a photograph of Parra looms in the back. This is quite extraordinary when it is contrasted with data from 2006, when 66.1% of those interviewed responded they would not participate in public protests against government authorities or private corporations (PNUD, 2006, p.293). The posts reflect a generation empowered and committed to change, especially in regard to a system that is perceived as manipulated by the wealthy against the rest of the population). As one post states, “poetical acts must also contain politics”.

These representations of a future are acts of agency, as people act out their identity – in this case struggling against an unsatisfactory present. The mediations and remediations of the posts are tools of self-formation and connection that guide identity and future memory - part of a narration of the project of who we want to be.

4. Conclusion

This paper aimed to contributed to contemporary understandings of Chilean identity and memory. Speaking of a such an identity has always been complex, not only because all identities are plural and continuously shifting, but also because of the impact of colonialism, elitism, Pinochet’s dictatorship and current neoliberal policies on our culture and public consciousness. Still, Parra’s death provided a useful lens to study Chileanness: this owes not only to his importance in the national imaginary, but also because of his praise and celebration of Chilean everyday culture, his use of ordinary language in his work, and his critical attitude towards all institutions and their elitism. By taking Nicanor Parra’s death to be a memory site and studying Instagram posts uploaded in the wake of his death with the hashtag #nicanorparra, I examined contemporary discourses regarding Chileanness and Chilean memory today.

The meanings embodied in these posts were multi-layered and rich, offering an illuminating snapshot of Chile’s memoryscape, and of current values and perspectives in relation to Chileanness. It was evident, after spending time with the posts, that by mediating and remediating Parra’s anti-poems and ideas, Instagram users had a story to tell about Chile today. They constructed Parra as a modern prophet, who spoke out against all manner of institutions, and his criticism and “anti-ness” articulated through texts and images to indict a neoliberal system that has gravely impacted economic equality and Chile’s environment. And by imaginatively projecting their ambitions and desires into the future, users are emotionally connecting with, and becoming more critical of, present contingencies. This supports the demands for major social change that have been expressed outside the online realm: student protests, new political forces, and a burgeoning feminist movement. Thus, users employed the discourses of anti-poetry, a discourse critical of power and the exclusion it forces on people, re-signifying Chileanness and reconstructing a fractured identity.

Still, these findings are subject to limitations. Factors such as gender, religion, class, and other individual characteristics can intersect with media use, to engender diverse performances of national identity. One should be cautious about essentialist assumptions of collective identity, as each individual negotiates their identity differently. This is especially important when considering that these representations were created by a particular group of people, sharing a special interest in Parra - which of course is not the case for all Chileans. The findings could eventually be complemented through interviews and focus groups that expand on people’s perceptions and ambitions with regards to the subject of identity and memory. As the feeling of crisis intensifies, it becomes increasingly important for scholars to study the subject of memories of the future in Chile more profoundly in order to examine what kind of representations, hopes and ambitions are being articulated. Likewise, it seems crucial to examine how the changes that Chileans are demanding could be accomplished: scholars should look at art, public policy and education, and their potential for engendering critical thinking, productive solutions, and more.

References

- Anderson, B. (2006) *Imagined communities*. Second. London: Verso.
- Becker, D. (2017) ‘Instagram as a potential platform for alternative visual culture in South Africa’, in M. Bunce, S. Franks, and C. Paterson (eds) *Africa’s Media Image in the 21st Century From the ‘Heart of Darkness’ to ‘Africa Rising’*. Oxo: Routledge, pp. 102–112.
- Binns, N. (2006) ‘Introducción’, in N. Binns and N. Parra (eds) *Obras Completas & Algo +*. Barcelona: Galaxia Gutenberg, p. XXIX–LXXVI.
- van Dijck, J. (2007) *Mediated memories in the digital age*. Stanford, Calif: Stanford University Press (Cultural memory in the present).

- Donoso Fritz, K. (2009) “‘Fue famosa la chingana...’ Diversión popular y cultura nacional en Santiago de Chile, 1820-1840’, *Revista de Historia Social y de las Mentalidades: Departamento de Historia Universidad de Santiago de Chile*, pp. 87–119.
- Erl, A. and Rigney, A. (2012) ‘Introduction: Cultural Memory and its Dynamics’, in A. Erl and A. Rigney (eds) *Media and Cultural Memory / Medien und kulturelle Erinnerung*. Berlin, New York: Walter de Gruyter. Available at: <https://doi.org/10.1515/9783110217384.0.1>.
- Frith, S. (2011) ‘Music and identity’, in S. Hall and P. du Gay (eds) *Questions of Cultural Identity*. 1 Oliver’s Yard, 55 City Road, London EC1Y 1SP United Kingdom: SAGE Publications Ltd, pp. 108–127. Available at: <https://doi.org/10.4135/9781446221907>.
- Gallardo, A. (2004) ‘Nicanor Parra en el Territorio del Lenguaje’, *Acta Literaria*, pp. 33–45.
- Grossman, E. (1975) *The Antipoetry of Nicanor Parra*. New York: New York University Press.
- Hall, S. (2000) ‘Cultural Identity and Diaspora’, in N. Mirzoeff (ed.) *Diaspora and Visual Culture Representing Africans and Jews*. London ; New York: Routledge, pp. 21–33.
- Hall, S. (2011) ‘Introduction: Who Needs “Identity”?’, in S. Hall and P. du Gay (eds) *Questions of Cultural Identity*. 1 Oliver’s Yard, 55 City Road, London EC1Y 1SP United Kingdom: SAGE Publications Ltd, pp. 1–17. Available at: <https://doi.org/10.4135/9781446221907>.
- Huyssen, A. (2003) *Present pasts: urban palimpsests and the politics of memory*. Stanford, Calif: Stanford University Press (Cultural memory in the present).
- Keightley, E. and Pickering, M. (2012) *The mnemonic imagination: remembering as creative practice*. Houndmills, Basingstoke, Hampshire : New York: Palgrave Macmillan (Palgrave Macmillan memory studies).
- Larraín, J. (2010) ‘Identidad chilena y el bicentenario’, *Estudios Públicos*, pp. 5–30.
- Martín-Barbero, J. (1987) *De los medios a las mediaciones. Comunicación, cultura y hegemonía*. 5th edition. Colombia: Editorial Nomos.
- Martín-Barbero, J. (2006) ‘Intervening From and Through Research Practice: Meditations On The Cuzco Workshop’, in D. Sommer (ed.) *Cultural Agency in the Americas*. London: Duke University Press, pp. 31–51.
- Parra, N. (1969) *Obra Gruesa*. Santiago: Editorial Universitaria.
- Peña, C. (2012) ‘Parra: El hombre a la interperie’, *Hispanérica*, pp. 33–41.
- Plate, L. and Smelik, A. (eds) (2015) *Performing memory in art and popular culture*. First issued in paperback. (Routledge research in cultural and media studies, 48).
- Rodríguez, M. (2011) ‘Dos metonimias de Neruda y parra: el bolero y la cueca’, *Revista Chilena de Literatura*, pp. 145–154.
- Schwartz, B. (2016) ‘Rethinking the concept of collective memory’, in A.L. Tota and T. Hagen (eds) *Routledge International Handbook of Memory Studies*. London: Routledge, pp. 9–21.
- Subercaseaux, B. (2016) ‘Políticas Culturales en Chile: Una Perspectiva Histórica’, *Estudios Públicos*, pp. 205–232.

All You Need is Love? An Analysis of the Election Campaign of the Green Party in 2021 on Facebook

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Abstract: The 2021 federal election in Germany was very different from previous elections. For the first time, the environmental party, The Greens, ran a candidate for chancellor. In addition, the election campaign was increasingly digital due to the Corona pandemic. Citizens increasingly turned to the internet for information. In this context, Facebook was the most used social network for reading, sharing, and discussing political news. This paper examines the Green Party's use of Facebook during the election campaign to identify characteristics of their communication behaviour and user reactions. The empirical investigation is carried out by means of a qualitative content analysis according to Mayring. In the period from 01/04 to 26/09/2021 a total of 251 posts of the Green Party were analysed. The tool Fanpage Karma was used for this purpose. Based on the number of posts, relevant topics of the online election campaign were identified. We also looked at how often and with which reactions users responded to the party's posts. The results of the study show that the 2021 chancellor candidate Annalena Baerbock plays a prominent role. She is mentioned in 30.68% of all posts. In addition, environmental policy, the party's core issue, takes up a comparatively large amount of space with a total of 111 posts (44.22%). Of these, 39.84% deal with climate-related issues. The results of the analysis also show that the party has a broader range of topics. Social issues are mentioned in 38.65% of the posts and the image of being a 'single-issue party' is being shed to some extent. It can also be seen that The Greens, who are among the winners of the 2021 election, publish a comparatively low number of posts. At the same time, they receive the second-most 'Love' reactions, and the most 'Loves' per post. The study shows Facebook's status in the online election campaign of the German environmental party in the 2021 federal election. It provides information about the scope of use and topic setting on the social platform. At the same time, the results show to what extent and with what reactions the posts have been addressed.

Keywords: Online Federal Election, Digital Campaign, Facebook, Green Party, Reactions

1. German Federal Election 2021, The Greens and Facebook

Germany's 2021 federal election was different. After sixteen years as Chancellor, Angela Merkel decided not to stand for re-election. For her party, the CDU/CSU, this meant that they would have to fight harder than before to regain voters' trust and get re-elected. In addition, for the first time in their history, Alliance 90/The Greens (hereafter: 'The Greens') have put forward a candidate for chancellor in 2021. The big issue of 2017, the refugee crisis, did not continue to drive public debate. Instead, the election was overshadowed by the COVID-19 pandemic, its measures, and consequences. For the political parties, this meant a rethinking of the 2021 election campaign and an even greater shift to the internet (Hirndorf 2022:15). At the same time, people increasingly turned to the internet and social media to keep up with political events (Hölig & Hasebrink 2020:5-6, 22-24, 43, Hirndorf 2022:15-18). These developments provided an exciting starting point for exploring the social media activities of political parties and their supporters.

This paper focuses on Facebook, the most widely used social network for reading, sharing and discussing political news, and the Green Party's use of Facebook during the election campaign. The aim is to identify the behaviour of the party and that of Facebook users. With Facebook's user numbers falling, particularly among the under-30s who are increasingly turning to other platforms, the question is whether Facebook will still be a relevant network in 2021 (Beisch & Koch 2021:499, Hirndorf 2022:20). 54% of under-20s still claim to use the network regularly (Brandt 2021). Furthermore, Facebook is still the leading network for reading, sharing, and discussing political news in 2021 (Beisch & Koch 2021:499, Hirndorf 2022:20). Only a third of respondents who use the network to read political content also use interactive features such as liking, sharing, and commenting (Hirndorf 2022:17-18). On this basis, it can be assumed that Facebook remains a relevant social network and is also relevant to the election campaign.

2. Theoretical background to the use of social media in election campaigns

Since the beginning of the 2010s, research interest in the use of social media in election campaigns has increased. Klinger (2013) examined how Swiss parties use social media, including Facebook. Staender, Ernst and Steppat (2019) investigated the contributions of the seven largest parties in the Swiss parliament three months before the election. Bene (2016, 2017) examined the use of Facebook in the Hungarian parliamentary elections

by exploring what kind of political content triggers Facebook reactions (likes, comments, shares). Heiss, Schmuck and Matthes (2019) explore the aspects that trigger user engagement in the form of comments, shares and likes. They also examine the reasons that motivate political actors to respond to user comments. The analysis refers to the Facebook pages of the most important political actors in Austria. Eberl et al (2020) focus on the Austrian federal elections of 2017. The study focuses on the connection between the sentiment of posts, issue relevance and user reactions. The Austrian elections of 2017 are also investigated by Ennser-Jedenastik et al (2021). A new perspective is taken by analysing the parties' reactions to user engagement. The research shows that parties are more likely to address issues that receive a lot of attention from Facebook users. Consequently, social media can improve the parties' ability to address popular issues. Gerbaudo, Margona and Alzetta (2019) focus on the importance of social media in the UK general elections. The focus is on the relationship between topics, emotions, and user engagement. The finding of this study is that positive content performs better than negative and controversial topics.

There is also academic interest in the use of Facebook by German political parties. In the early 2010s, Siri, Melchner and Wolff (2012) explore the question of how the network is used by parties and politicians. They also look at the effects that the use of digital networks has on political communication. Evers (2019) examines the Facebook campaigns of the German parties and considering user reactions. The researcher finds that especially the use of traditional strategy components such as the top-down approach, self-praise, and self-promotion and the bashing of competing parties meet with a high level of engagement. The focus of Margin et al (2016) is also on the 2013 federal election. The central question is how the Austrian and German parties use Facebook as an election campaign tool. Finally, Haller (2019) examines online campaigns in the 2017 federal election campaign, focusing on the communication of top candidates and parties on Facebook.

3. Research subject and methodology

The analysis of Facebook posts and user reactions is carried out using qualitative content analysis, based on Mayring's (2016) suggestions for carrying out the methodology. It is characterised by the fact that the content to be analysed comes from communication and has communication as its subject. However, communication is not limited to linguistic content, but also includes 'pictures, music and the like'. It is essential that the communication is 'fixed communication', so it has to be recorded in some way (Mayring 2016:11-12). The systematic approach according to fixed rules contributes to the scientific character and distinguishes it from hermeneutics. The specification and disclosure of the individual research steps enables strict methodological control and contributes to the comprehensibility of the analysis (ibid.:13). While the results of quantitative studies often fall short of a number, it is possible in qualitative analysis to add further aspects. These can be, for example, the conditions of origin, the wider context, or the impact of the communication (ibid.:50).

The core of qualitative content analysis is the category system (ibid.:51, 65). The system is created in detail and thus guarantees the comprehensibility and comparability of the study. Furthermore, the analytical framework contributes to intersubjectivity and reliability (ibid. 2016:51-52). Frequency analysis is a basic technique of the content analysis process (ibid.:13), which, like so many others, is based on the category system. On this basis, the data to be analysed are examined, and the pre-defined aspects are filtered out (ibid.:13, 65). The material components are compared and weighted based on frequencies (ibid:13). For the election analysed, we created a system consisting of the main themes and sub-themes of the posts, with 90 sub-categories belonging to 15 categories (Table 1).

Table 1: Category system for political parties' Facebook activities during the 2021 German federal election

Categories	Sub-categories
Labour and social affairs	Labour market, Pensions, Poverty, Marriage for all, Childcare, Family, Child poverty, Women's rights, Care, Justice, Housing and construction, Solidarity, Social inequality
Education and research	Education, Research
Health, Nutrition, Agriculture	Animal welfare, Healthcare, Agriculture, Corona pandemic
Environment	Climate, G20, Power plants, Renewable energy, Marine protection, Species protection, Nature conservation, Circular economy
Finance	Banks, Taxes, National debt, Burden on local governments
Justice and consumer protection	Justice, Consumer protection

Categories	Sub-categories
Domestic policy	Internal security, Police, Cannabis, Rent control, Business, Economy, Bureaucracy, Voting over 16, Religion (except Islamisation), Freedom of the press, Border controls, Lobbying, Direct democracy, Counter-extremism, Public service broadcasting, Discrimination against minorities, LGBTQ+, Technology & innovation, Urban/rural, Sports/culture
Foreign policy	Europe and the EU, Worldwide, Partner countries, Arms exports, Terrorism, Turkey's EU accession, Foreign policy
Asylum policy	Migration and integration, Refugees, Islamisation, Upper limit, Guiding culture
Defence	Bundeswehr, Culture of remembrance, NATO, Disarmament
Traffic	Traffic infrastructure, Cars and their use, Car companies, Public transport & railways
Digital infrastructure	Digitalisation, Broadband internet, Computer games
Electoral appeal	'Vote for us', 'Go vote'
Bashing	Against parties, Against politicians, Against media, Against gender, Against rich/corporations
Party internal	Party members, Party events, Election, Party members live chat, General information, TV appearance, Other elections

The study period starts on 01/04/2021 and ends on election day, 26/09/2021. The Facebook posts are displayed on the fan pages of the parties and can be accessed by any Facebook user. The posts can contain text, image and video material, whereby a combination is also possible. Since the posts were made in the context of the federal elections, it can be assumed that they were intended to reach and address potential voters. The analysis has two objectives: Firstly, to examine the parties' campaign communication on Facebook, by determining the extent to which the parties are active on the social network and the issues they address. Second, the mood of Facebook users, including potential voters, will be assessed. The main question is how and to what extent they react to the posts. The focus is on 'Like', 'Love' and 'Angry' as primary reactions. The Facebook posts are analysed based on the category system. Each post is assigned to at least one category; multiple assignments are possible. The research project will be carried out using the analysis tool Fanpage Karma. All posts shown are from the Facebook pages of the parties. The number of posts published in 2021 is 3,660. Of these, 242 are no longer accessible during the analysis due to deletion or restriction, so that only 3,418 posts can be analysed.

4. Findings

4.1 Election results, fan growth and general Facebook activity

Comparing the 2021 and 2017 elections in terms of fan growth, a positive development can be seen for all parties, with the most pronounced for the AfD (Table 1). This is followed by the CDU, The Greens and the SPD. The lowest growth can be seen in the CSU, FDP and The Left. However, the growth of Facebook fans from election day 2017 to 2021 does not seem to be related to election results. While AfD and CDU are among the three parties with the highest growth in fans, they are also among the three biggest election losers. The absolute number of fans does not reflect the distribution of seats either. Here the AfD and The Left are the frontrunners.

Table 1: Bundestag seats vs Facebook fan growth from election day 2017 to 2021

Party	Bundestag seats	Facebook fans	Seat growth	Fan growth
The Greens	118	208,809	176%	123%
SPD	206	194,291	135%	111%
FDP	92	152,054	115%	109%
CSU	45	214,966	98%	107%
AfD	83	515,374	88%	137%
CDU	152	196,876	76%	122%
The Left	39	248,521	57%	105%

Instead of comparing the growth of Facebook fans between the 2017 and 2021 election days, limiting the period under consideration to the 2021 campaign period yields a different result.

Figure 1 shows the percentage growth in fans between the first and the last day of a selected period. The difference between each day and the first day of the selected period is shown (Fanpage Karma 2022). Fans are users who have marked a page with a ‘Like’. In the newer version of the social network, however, the term ‘follower’ is also used at this point. In addition, users who have subscribed to a page's notifications are also referred to as followers (Fanpage Karma 2022). The follower metric has only recently been made available by Facebook.

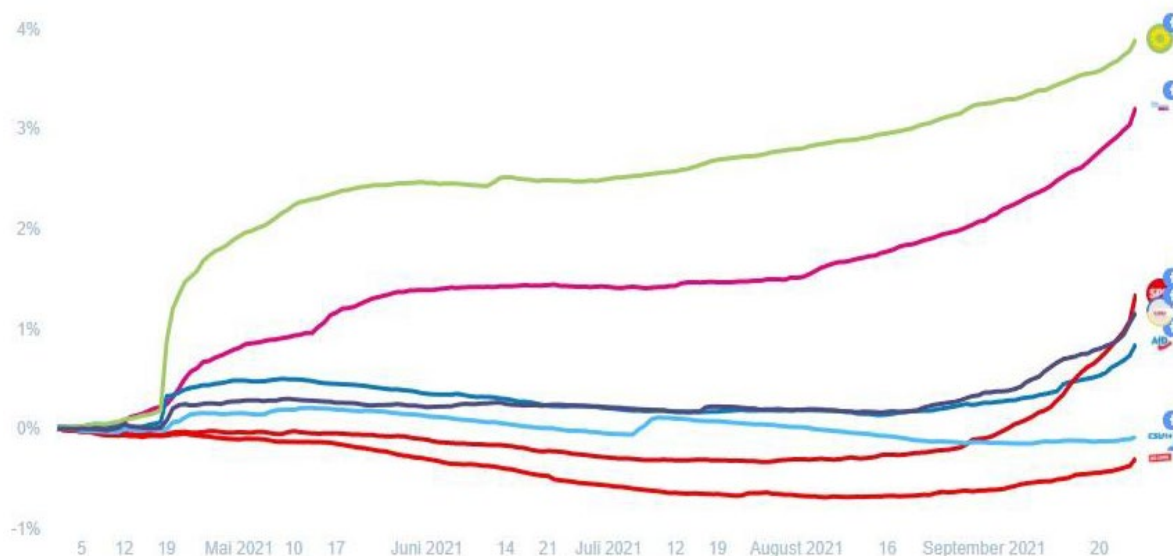


Figure 1: Percentage fan growth (Fanpage Karma 2022)

As can be seen in Table 2 The Greens and the FDP achieved the greatest growth in the number of followers. Of the 3,445 posts, 747 are attributable to the CSU, 678 to the AfD, 680 to the CDU, 462 to the SPD, 417 to the FDP, 251 to The Greens and 210 to the Left. The following analyses focus mainly on the ratio of indicators to the number of posts. Although absolute numbers have also been recorded and compared and should also be taken into account for a better comparability of the actors, the primary insights are gained from the indicators per post. Table 2 also includes the number of posts published per day during the selected period. Most parties publish rather few posts per day. The CSU and the AfD are the only exceptions. The Greens and The Left post particularly little. Furthermore, many parties increase the number of posts per day shortly before the election. This is particularly true of the CDU. However, the FDP, The Left and the AfD do not show a strong increase. For the FDP and The Left the number of posts remains at a constant low level. The AfD has maintained the number of posts it has had since the beginning of the survey period.

Table 2: Facebook follower growth, number of posts and posts per day

Party	The Greens	FDP	SPD	CDU	AfD	CSU	The Left
Follower growth	3.9 %	3.2 %	1.3 %	1.2%	0.8%	-0.1%	-0.3%
Total posts	251	417	462	680	678	747	210
Posts per day	1.4	2.3	2.6	3.8	3.8	4.2	1.2

4.2 Posts and engagement by category

Most of the Greens' posts deal with internal party matters (see Figure 2). But ‘labour and social affairs’ and ‘environment’ were also covered in more than 100 posts.

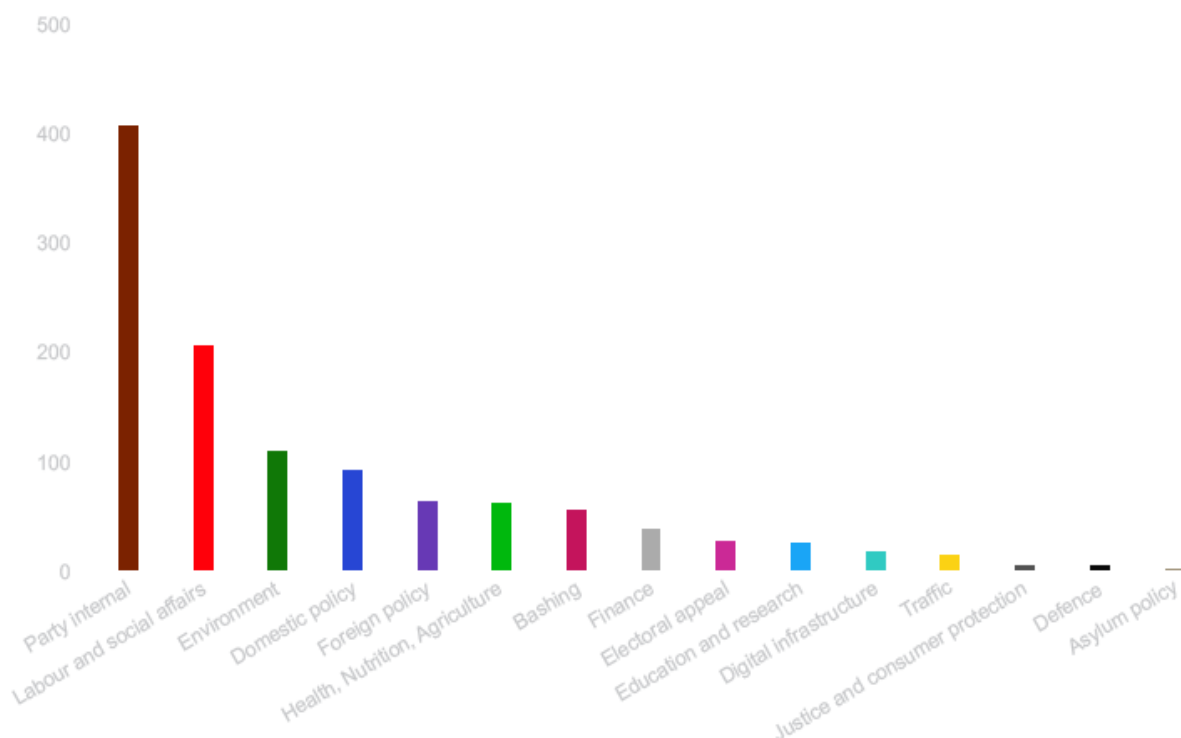


Figure 2: Number of posts per category by The Greens

The sub-categories 'Party members', 'Election' and the typical party topic 'Climate' were particularly popular (see Table 3). In addition to the sub-categories already mentioned, a strong reference to the chancellor candidate Annalena Baerbock can be observed. With 77 posts, the candidate has the fourth most posts.

Table 3: Posts and engagement per sub-category by The Greens

Sub-category	Number of posts	Percentage of posts	Engagement rate
Party members	123	49.00%	0.87%
Election	109	43.43%	0.7%
Climate	100	39.84%	0.8%
Annalena Baerbock	77	30.68%	0.63%
Election calls	54	21.51%	0.39%

The sub-categories 'Party members', 'Election' and the typical party topic 'Climate' also show the highest engagement. Posts featuring Annalena Baerbock generated 0.63% engagement. **Figure 3** shows that the candidate was successfully brought into the focus of activities, especially at the beginning of the election. The top four posts address topics that fall into the categories 'Party internal' and 'Election appeal', two of them featuring Annalena Baerbock.



Figure 3: Engagement and top posts of The Greens (Fanpage Karma 2022)

4.3 Reactions and comments

When analysing engagement with social media posts, other reaction options ('Like', 'Angry', 'Wow', 'Haha' and 'Sad') as well as comments may be relevant in addition to the 'Loves' focused on in this paper. 'Haha', 'Wow' and 'Sad' are less relevant due to lower usage. The difficulty with the comments, 'Angry' and 'Like' metrics is that they do not indicate agreement or disagreement with the content of the posts. It is debatable whether 'liking' a post means that one agrees with it, or whether one is simply trying to improve the distribution of the post by pointing out a grievance. For example, about plane crashes receive 'Likes', but certainly not 'Loves'. 'Angry' is also open to interpretation. The AfD triggers a strikingly high number of 'Angry' reactions. While the party may have published the most controversial content, which met with considerable opposition, it is also realistic that supporters of the 'protest party' use the reaction to show their agreement with the grievances propagated by the party. In addition to the AfD, the CDU and CSU have increasingly provoked 'angry' reactions. Posts from the SPD, FDP, The Greens and The Left rarely received 'Angry' reactions. A similar pattern can be seen for comments. The AfD posts are the most commented on, the CDU also published posts that generated many comments. The posts of the other parties receive comparatively few comments.

4.4 'Love' reactions

Table 4 shows the number of 'Love' reactions by party. While the AfD received more 'Loves' in total, this is achieved through a high number of posts. With 109 'Loves' per post, posts of The Greens are much more frequently marked with the reaction.

Table 4: Number of total 'Love' reactions and 'Loves' per post

	The Greens	CDU	CSU	SPD	FDP	The Left	AfD
Total Loves	27,404	6,448	4,870	9,833	10,197	6,261	32,769
Loves per post	109.2	9.5	6.5	21.3	24.5	29.8	48.3

Considering the developed category system, The Greens achieve the highest total number of 'Love' reactions (Table 5). This is due to the fact that the posts of The Greens covered more content categories per post than those of the AfD. The Greens received a particularly high number of 'Loves' in the categories 'Party internal', 'Environment', 'Labour and social affairs' and 'Domestic policy'.

Table 5: Numbers of ‘Love’ reactions per category

Category	The Greens	AfD	SPD	FDP	CDU	The Left	CSU
Labour and social affairs	10,503	3,943	3,545	1,113	1,193	1,985	366
Education and Research	3,220	893	226	1,535	457	26	91
Environment	14,029	1,909	2,150	743	863	758	324
Health, Food, Agriculture	2,718	6,026	727	1,188	815	502	408
Finance	1,183	1,646	714	1,124	593	852	277
Domestic Policy	8,927	5,621	1,625	6,451	1,805	1,226	941
Foreign Policy	3,522	2,669	844	232	886	634	559
Asylum policy	753	4,262	17	31	159	53	110
Defence	464	368	29	56	393	968	413
Traffic	2,185	1,032	157	338	102	413	385
Digital Infrastructure	1,921	29	182	1,476	376	0	18
Election appeal	7,465	1,662	615	276	782	735	309
Bashing	1,993	11,490	1,750	796	484	1,545	916
Party internal	18,781	20,632	8,846	2,899	5,159	3,201	3,534
Justice and Consumer Protection	1,965	1,704	69	437	234	12	110
Total Loves	79,629	63,886	21,496	18,695	14,301	12,910	8,761

In terms of the number of ‘Loves’ per day (N=179), it can be seen that the Green Party has the second-highest mean value (**Table 6**). The difference to almost all other parties is considerable.

Table 6: Comparison of ‘Love’ reactions per day: means, standard deviations and standard error of mean

Political party	N	Mean	SD	SEM
The Greens	179	153.09	313.825	23.456
CDU	179	36.02	71.754	5.363
CSU	179	27.21	31.105	2.325
FDP	179	56.97	332.301	24.837
The Left	179	34.98	67.114	5.016
SPD	179	54.93	134.268	10.036
AfD	179	183.07	226.765	16.949
Non-Greens	179	65.61	86.736	6.483

To test the significance of these results, an independent samples t-test was performed. Levene's test for equality of variances was also performed to determine whether there was homogeneity of variance in the samples. Levene's test showed unequal variances for all datasets except The Greens vs. AfD. As the standard t-test

assumes that the means of the compared samples are normally distributed with equal variance, Welch's t-test was performed to address this issue. Welch's t-test is designed for unequal variance of the sample distribution, but the assumption of sample distribution normality is maintained. **Table 7** shows the results of Levene's test and the t-test, with the necessary adjustments for scales with unequal variances by using Welch's t-test.

Table 7: Levene test for equality of variances and t-test for independent samples

The Greens versus	Levene test		t-test							
	F	P	T	Df	P ₍₁₎	P ₍₂₎	MD	SED	95% CI	
CDU	35.63	0.000	4.87	196.56	0.000	0.000	117.07	24.06	69.75	164.39
CSU	46.45	0.000	5.31	181.50	0.000	0.000	125.89	23.57	79.38	172.40
FDP	7.71	0.006	2.84	354.84	0.003	0.005	96.13	34.16	28.94	163.32
The Left	35.36	0.000	4.94	194.25	0.000	0.000	118.12	23.99	70.81	165.43
SPD	23.94	0.000	3.85	241.05	0.000	0.000	98.16	25.51	47.91	148.42
AfD	1.13	0.288	-1.04	356.00	0.151	0.301	-29.97	28.94	-86.89	26.94
Non-Greens	31.31	0.000	3.60	205.04	0.000	0.000	87.49	24.34	39.51	135.47

These results show that, overall, The Greens received significantly ($P(1) < 0.05$) more 'Loves' reactions per day than all other political parties except the AfD. There is no significant difference in 'Loves' per day between The Greens and the AfD ($P(2) = 0.301 > 0.05$), even though the AfD received more 'Loves' overall due to a much higher number of posts during the period examined.

5. Limitations and future work

The aim of this paper, to find out the usage behaviour of the Green Party's followers on Facebook, was largely achieved. Unfortunately, there was a lack of data for the most prominent finding, the significantly higher number of 'Love' reactions. Only aggregated data on the total number of 'Love' reactions and the number of posts is available. If the data for 'Love' reactions were available for all posts, a significance test for 'Loves' per post could be performed. Alternatively, the number of 'Loves' per day for which a dataset was available was used. This approach ignores the highly varying number of posts per day by political parties. As the Green Party published the second lowest number of posts, the results are even more surprising. While similarities and differences in the parties' use of the platform and users' reactions could be identified, the results do not give any indication as to why and under what circumstances individual reactions were used. While the Love reaction is quite clearly interpretable, it is still possible, for example, that voters of conservative parties are generally more reserved and therefore, may use 'Likes' more often than 'Loves'.

It should be noted that the data ideally would have been collected during the election campaign. The background to this is the observation of deleted posts. While the established parties had a maximum of 24 deleted posts, the AfD had 151 (18%). Therefore, it cannot be excluded that the results were biased. Furthermore, it was not possible to determine whether and which posts were supported by advertising. The lack of stringency in the category system also needs to be addressed. During the editing process, it became clear that the categories were not created in accordance with the stated responsibilities of the federal ministries. For example, 'Economy' was defined as a sub-category of 'Domestic policy'. Given that 'Economy' is a very broad subject area assigned to a separate federal ministry, this seems anything but proportionate. Furthermore, the category system contains misleading terms such as 'Party internal'. Since other content has been assigned to this category, a different term should be chosen in the future.

It is also unclear whether Facebook users are eligible voters who participate in the election at all. It is also unclear whether and to what extent the online campaign has an impact on individual voting decisions and whether social media is used by voters as an information channel. It is therefore conceivable that the topic could be explored with greater involvement of individual voters and Facebook users. If the study is replicated, the existing codebook should be used again for reasons of comparability.

6. Practical implications and conclusion

For The Greens, a strong focus on the chancellor candidate can be observed. While this is not unusual for mainstream parties, this was the first time the Greens ran a female candidate for chancellor. In addition to this issue, climate change was the driving force of the campaign. While the Greens are the epitome of this issue, the CDU and SPD have shown a strong turnaround. This may be a reaction to the growing strength of The Greens and their positive election forecasts. As a result, the Greens were increasingly criticised by the AfD and the CSU. While the governing parties increasingly focused on environmental issues, the Greens took on a wider range of issues and, to some extent, shed their image as a 'single-issue party'. While the number of posts obviously did not indicate the outcome of the election, the 'Love' and 'Angry' reactions did. As a result, election winners stand out with many 'Love' and election losers with many 'Angry' reactions. AfD posts seem to polarise Facebook users, who react with a lot of 'Angry' but also 'Love'. The Greens are the winners of the election. Despite a small number of posts, the party achieved the highest follower growth and received an exceptionally high number of 'Loves' per post. The significantly higher number of 'Loves' per day compared to almost all other parties could be shown here. In 2020, Facebook started promoting posts with 'Love' reactions more strongly (Merrill & Oremus 2021), which explains the highest growth in followers. Parties could take this into account in the future and promote content that specifically encourages 'Love' reactions.

References

- Beisch, N., & Koch, W. (2021). Aktuelle Aspekte der Internetnutzung in Deutschland. 25 Jahre ARD/ZDF-Onlinestudie: Unterwegsnutzung steigt wieder und Streaming/Mediatheken sind weiterhin Treiber des medialen Internets. *Media Perspektiven*, 10, 486-972.
- Bene, M. (2016). Go viral on the Facebook! Interactions between candidates and followers on Facebook during the Hungarian general election campaign of 2014. *Information, Communication & Society*, 20(4), 513-529.
- Bene, M. (2017). Sharing is caring! Investigating viral posts in politicians' facebook pages during the 2014 general election campaign in Hungary. *Journal of Information Technology & Politics*, 14(4), 387-402.
- Brandt, M. (2021). *Facebook verliert die Jugend*. Statista Global Consumer Survey, [online], <https://de.statista.com/infografik/24717/umfrage-zur-regelmaessigen-nutzung-von-facebook/>.
- Eberl, J., Tolochko, P., Jost, P., Heidenreich, T., & Boomgarden, H. (2020). What's in a post? How sentiments and issue salience affect users' emotional reaction on Facebook. *Journal of Information Technology & Politics*, 17(1), 48-65.
- Ennsner-Jedenastik, L., Gahn, C., Bodenlos, A., & Haselmayer, M. (2021). Does social media enhance party responsiveness? How user engagement shapes parties' issue attention on Facebook. *Party Politics*, 28(3), 468-936.
- Evers, T. (2019). Stimmungsbarometer Facebook: Über das Verhältnis von Strategie und Beteiligung während des Bundestagswahlkampfes 2013. In Engelmann, I., Legrand, M., & Marzinkowski, H. (2019), *Politische Partizipation im Medienwandel*, Berlin, 103-128.
- Fanpage Karma (2022). *Metrics Overview*. [online], <https://academy.fanpagekarma.com/en/metrics/>.
- Gerbaudo, P., Margona, F., & Alzetta, C. (2019). When 'Positive Posting' Attracts Voters: User Engagement and Emotions in the 2017 UK Election Campaign on Facebook. *Social Media + Society*, 5, 1-11.
- Haller, A. (2019). Die Online-Kampagnen im Bundestagswahlkampf 2017. In Holtz-Bacha, C. (2019), *Die (Massen-)Medien im Wahlkampf*, Wiesbaden.
- Heiss, R., Schmuck, D., & Matthes, J. (2019). What drives interaction on political authors' Facebook posts? Profile and content predictors of user engagement and political actors' reactions. *Information, Communication & Society*, 22(10), 1497-1513.
- Hirndorf, D. (2022). *Wir müssen Reden. Politische Diskussionen im Wahlkampf*. Konrad Adenauer Stiftung e. V.
- Klinger, U. (2013). Mastering the art of social media. *Information, Communication & Society*, 16(5), 717-736.
- Margin, M., Poduschweit, N., Haßler, J., & Russmann, U. (2016). Campaigning in the fourth age of political communication. A multi-method study on the use of Facebook by German and Austrian parties in the 2013 national election campaigns. *Information, Communication & Society*, 20(11), 1698-1719.
- Mayring, P. (2016). *Einführung in die qualitative Sozialforschung*. Beltz.
- Merrill, J. B., & Oremus, W. (2021). Five points for anger, one for a 'like': How Facebook's formula fostered rage and misinformation. *The Washington Post*, [online], <https://www.washingtonpost.com/technology/2021/10/26/facebook-angry-emoji-algorithm/>.
- Siri, J., Melchner, M., & Wolff, A. (2012). The political network: Parteien und politische Kommunikation auf Facebook. *kommunikation@gesellschaft*, 13, 1-29.
- Staender, A., Ernst, N., & Steppat, D. (2019). Was steigert die Facebook-Resonanz? Eine Analyse der Likes, Shares und Comments im Schweizer Wahlkampf 2015. *SCM Studies in Communication and Media*, 8(2), 236-271.

Work in Progress Papers

Mediatized Teachers-Students Interactions: How Mobile Social Networks Modify Pedagogical Contact

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Abstract: This paper is inspired by work on a doctoral thesis "Transformation of intersubjectivity in mediatized higher education" (EHU, Lithuania), where the implementation of social networks in education is treated as one of the cases of a broader process of mediatization. To analyze the transformation of intersubjective interaction in the mediatized pedagogical process, phenomenological optics is used. In contrast to research that treats "student experience" as "user experience" that is open to manipulation, measurement, and optimization (Ginzburg, 2011), the phenomenological approach considers it as a subject-subject interaction and the event of coexistence in pedagogical contact (Friesen and Hug, 2009; Friesen 2011). Thus, the paper substantiates the relevance of phenomenological optics for searching for answers to the following questions: how does the use of mobile social networks transform the intersubjective interactions of teachers and students?; how does this implementation modify pedagogical contact?; what are the consequences for the whole pedagogical process? Application to phenomenological methodology and conducting hermeneutic interviews are proposed as ways to get answers to these questions.

Keywords: Higher education, Intersubjective interaction, Mediatization, Mobile social networks, Pedagogical contact, Phenomenology.

1. Introduction

According to statistics, 5.32 billion people around the world are mobile phone users. 4.65 billion of them, or 58,7% of the world's population, are active social media users (Kemp, 2022). Mobile gadgets and social networks as a means of communication are particularly popular among the so-called "Net Generation". The peculiarity of the representatives of this generation is that their socialization took place with quite free access to the Internet. Today these people make up the majority of college and university students (Barnes, Marateo and Ferris, 2007). Mobile phones and laptops are the main means of obtaining knowledge and skills for them. For this reason, universities are forced to increase their online presence and use social media to engage the audience in their events. In recent years in the field of higher education there has been a noticeable trend towards expanding the use of social networks by colleges and universities (Feehan, 2023). The above-mentioned facts actualize finding out the answer to the question of how to make use of mobile social networks, originally designed for entertainment (Larrieu and Di Gesú, 2021), an effective pedagogical tool.

2. Mediatization of Higher Education

The question of the place and role of mobile devices and social networks in modern education is part of a broader discussion on the mediatic turn and the influence of mediatization on the pedagogical process in general.

The mediatic turn can be defined as a transformational shift driven by the widespread use of media in all areas of life, including everyday human contacts and global social processes. According to Friesen and Hug approach this turn has fundamental cultural, epistemological, and even existential consequences (Friesen and Hug, 2009). Although modern researchers of mediatization (Couldry, 2012; Hajarvard, 2014; Krotz 2007; etc.) assess the specifics of the ongoing transformations in different ways, they are in solidarity with the fact that mediatization is a multifaceted phenomenon that affects social institutions, communication models, our behavior and values.

Mediatization as a meta-process influences education. Today we are unlikely to agree with R. Clark's conclusions, based on the results of comparative studies, that "there are no learning benefits" to be gained from the implementation of media in the pedagogical process (Clark, 1983: 445). According to the researcher, "media are delivery vehicles for instruction and do not directly influence learning" (Clark, 1983: 453). In the years following the publication of his work, many arguments were provided pointing out the fallacy of his view, e.g.: (Petkovich and Tennyson, 1984). Mediatization of higher education research (Friesen and Hug 2009; Oosthoek, 2013; Poplavskiy, 2021; etc.) emphasizes that the integration of media into education affects not only the quality of learning but also transforms the learning process itself, as well as its goals and objectives.

3. Mobile Social Networks as a Learning Tool

Since the beginning of the Covid-19 pandemic mobile social networks occupy an important place among mobile learning tools. Mobile learning can be described as planned and systematic use of mobile technologies in education. This interpretation is in line with the definition that describes mobile social networks as "any sort of learning that happens when the learner is not at a fixed, predetermined location, or learning that happens when the learner takes advantage of the learning opportunities offered by mobile technologies" (O'Malley et al. 2005: 7). This type of learning differs a lot from the usual practices: access to educational content is organized differently (via mobile applications); communication between teachers and students is not the same (there is a dependence on the application algorithms and the functions incorporated in its design); the planning of educational activity is also dissimilar.

Social networks play a special role in mobile education not only due to the wide range of their functions but first of all, due to their availability (or "handiness" (Zuhandenheit) in Heidegger's terminology). Social networks that allow access from mobile devices (Facebook, MySpace, Google Plus, etc.) and also mobile-based social networks, created by universities or student communities themselves, are actively used today to create virtual "bulletin boards", maintain contacts, control over the execution of tasks, exchange information, track the emotional mood of students, conduct consultations, etc.

Although the skepticism toward the possibilities of mobile social networks in higher education is still quite popular today, it is hardly possible to deny the influence of this tool on the process of obtaining new learning experiences for students.

4. Intersubjectivity in Mobile Learning Research

The overwhelming majority of works devoted to digital and, in particular, mobile technologies in educational activities comes from a paradigm in which the emphasis is made on the effective development of students' skills, their measurement, and reporting on their performance. Intersubjectivity in these publications attracts research interest insofar as interaction in mobile applications or social networks is a necessary condition for the successful achievement of learning outcomes. Intersubjectivity, interpreted, for example, as cooperation and engagement in the performance of tasks, is described primarily as a means of developing academically significant skills and abilities (Alamri, Almaayah and Al-Rahmi, 2020; Tang and Hew, 2017; Tu and Sujo-Montes, 2015). The following topics dominate the majority of publications: analysis of the benefits and risks of using mobile learning tools in education; evaluation of the effectiveness of the development of students' competencies; analysis of students' and teachers' assessments of the use of mobile applications and social networks (Baydas and Yilmaz, 2018; Nikolopoulou, Saltas and Tsiantos, 2023; Zaidi, Osmanaj, Ali and Zaidi, 2021; Zhang, 2015). Intersubjectivity sometimes becomes an independent object of scientific interest (Di Gesù, 2021), but it should be emphasized that there are still very few works that problematize the phenomenon of intersubjectivity in mobile learning research.

Also it seems useful to digress from the question of the effectiveness of mobile education and raise the question of what exactly changes in pedagogical contact when we use, for example, mobile social networks in higher education.

At the same time, there is a point of view according to which the vast majority of research in the field of mobile learning is not sufficiently theory-based, despite the importance of theory in guiding educational processes (Lamprey and Boateng, 2017; Okai-Ugbaje et al., 2017). In this context, the appeal to philosophical theory seems justified.

Since most of the work has a strong empirical character and uses questionnaires and surveys (Goundar and Kumar, 2021; Ray and Saeed, 2015; Snoussi, Belkacem, Radwan and Gaidi, 2020; etc.), it seems important to use different research methods.

5. Teachers-Students Interactions from a Phenomenological Perspective

Before moving on to a more detailed consideration of the specific use of mobile social networks in higher education, let's give a brief description of the phenomenological perspective, which seems promising for research on student-teacher interactions. The relevance of turning to this approach is due to the fact that it opposes the dominant view on the use of gadgets and mobile applications for gaining knowledge. The phenomenological view refers to the intersubjectivity experience constitution, where the process of gaining new

experience is no less important than the result. Phenomenology has a lot of methodological tools that allows to gain a deeper understanding of what happens when gadgets are used for educational purposes.

In this regard, it is worth mentioning Heidegger's reflections on the role of technology, as well as Ihde's more recent studies on the specifics of living in the modern technologized lifeworld (Ihde, 1990; Ihde, 2010). According to these approaches, technology is not only a tool that serves external purposes, but also something that helps us to be open to the world. From a phenomenological perspective, this opening is an event of coexistence (Bakhtin, Heidegger), in which no result can ever be given or predicted and only the movement toward the new experience is possible. Phenomenological thematization of intersubjectivity (Heidegger, Ricoeur, Waldenfels) can be useful for expanding the understanding of how mediatization transforms subject-subject interaction in pedagogical contact. The focus on the dialogue and the process of generating meanings (Gadamer) is promising for the analysis of what exactly happens between people during communication in social networks. The problematization of embodiment (Merleau-Ponty) can complement today's widespread interpretations of user experience as based solely on intellectual/cognitive work.

As a result, phenomenology can strengthen the foundations of qualitative research in education and technology by proposing a model of teacher-student interaction, where the emphasis is not on quantitative parameters, but on the holistic experience of intersubjective communication.

6. The Specificity of the Transformation of Pedagogical Contact (Hypothesis and Research Method)

From a phenomenological perspective, pedagogical contact between teachers and students is an event of the meeting, resulting in a new experience of interaction that is significant for all its participants. Pedagogical contact cannot be described in terms of a simple transfer of information from one subject to another. This is a complex and multifaceted process, the results of which are influenced not only by the cognitive or linguistic abilities of the participants but by the whole set of their manifestations: bodily expressions, emotional states, etc. Since pedagogical contact is always influenced by the environment, it is reasonable to assume that the introduction of mobile social networks into the pedagogical process of higher education institutions will also have significant consequences for each of the parties involved.

Based on the analysis of the research literature on the use of mobile social networks in higher education, we assume that key changes will be found in:

- reconfiguration of space and its new characteristics – this is evidenced by the fact that the university auditorium is being replaced by digital rooms, groups, and chats (so-called Appspace), which now act as a new environment;
- transformation of presence – this is evidenced by the fact that face-to-face communication with the usual signals of involvement (greetings, eye-to-eye contact, raised hand, etc.) has been replaced by new ways of "non-embodied" maintaining of contact and showing one's attention, interest, involvement or lack of it;
- shifts in time – this is associated with the blurring of the boundaries between studying and free time, different work structuring and task scheduling; prolongation of communication (communication extends in time) and a simultaneous increase in its discreteness (shorter messages, gaps between questions and an answers).

Focusing solely on theoretical sources cannot be sufficient in the study of changes in pedagogical contact, occurring under the influence of the increasing spread of mobile social networks. It is assumed that the use of a hermeneutic interview can significantly enrich the work (van Manen, 1997: 98–99; Friesen, 2011: 35–41). The hermeneutical interview as a research method differs from the traditional survey. It is quite a free interpretive conversation in which both of the participants are involved in a dialogue, which allows you to see the significance of the phenomenological issue. To achieve this goal, experience-oriented questions should be used: "What did you feel?", instead of "What did you think?"; "What was it like?", instead of "What happened?", etc. To obtain the most complete results, it is important to conduct such a conversation with all participants: both students and teachers.

7. Results and Discussion

Since the work is in progress, the selection of the best wording for the hermeneutical interview questions is ongoing. However, it seems significant that gaps in mobile learning research have been identified, and the

prospects of using phenomenological theoretical optics to overcome them have been substantiated. The work can also be significant for concretizing the understanding of the phenomenon of pedagogical contact and its specifics in the process of implementing mobile social networks in the practices of higher education. The contribution to academic debate lies in the fact that the research develops a line of moving away from focusing on efficiency in a quantitative sense and focuses on the analysis of the essential qualitative parameters of interaction between students and teachers.

8. Conclusion

As mentioned above, today both students and teachers often express skepticism about the prospects for the widespread implementation of mobile social networks in educational practices. Nevertheless, there are some reasons to believe that satisfaction with the use of new technologies may increase if the changes in pedagogical contact are taken into account. To carry out such research, it is important not to rely on the existing ideas about how social networks work from the technical side, but to analyze how the intersubjective interactions of teachers and students are changing under their influence. The results of this analysis will be useful for making recommendations for mobile application developers, which will probably make them more suitable for pedagogical purposes.

Acknowledgments:

The author extend her appreciation to prof. Tatiana Shchyttsova, colleagues from the Academic Department of Social Sciences and The Center for Research of Intersubjectivity and Interpersonal Communication (EHU) for their support in starting and continuing this research.

References:

- Alamri, M.M, Almaayah, D. and Al-Rahmi W.M. (2020) "Social Media Applications Affecting Students' Academic Performance: A Model Developed for Sustainability in Higher Education", *Sustainability*, No. 12(16). Available at: <https://www.mdpi.com/2071-1050/12/16/6471> (Accessed: 25 January 2023).
- Barnes, K., Marateo, R.C. and Ferris, S.P. (2007) "Teaching and Learning with the Net Generation", *Innovate: Journal of Online Education*, Vol. 3: Iss. 4, Article 1. Available at: <https://nsuworks.nova.edu/innovate/vol3/iss4/1> (Accessed: 15 January 2023).
- Baydas, O. and Yilmaz, R. (2018) Pre-service teachers' intention to adopt mobile learning: A motivational model. *British Journal of Educational Technology*, No. 49, pp. 137–152.
- Clark, R. (1983) "Reconsidering Research on Learning from Media", *Review of Educational Research*, Vol. 53, No. 4, pp. 445–459.
- Couldry, N. (2012) "Media, society, world: Social theory and digital media practice", Cambridge: Polity.
- Feehan, B. (2023) "2023 Social Media Industry Benchmark Report", *RivalIQ* [online] 21 February. Available at: <https://www.rivaliq.com/blog/social-media-industry-benchmark-report/> (Accessed: 21 March 2023).
- Friesen, N. (2011) "The Place of the Classroom and the Space of the Screen: Relational Pedagogy and Internet Technology", Peter Lang, New York.
- Friesen, N. and Hug, T. (2009) "The Mediatic Turn: Exploring Concepts for Media Pedagogy". In: Lundby, K. (ed.) *Mediatization: Concept, Changes, Consequences*, Frankfurt a.M., pp. 63–83.
- Ginsburg, S. (2011) "Designing the iPhone user experience: A user-centred approach to sketching and prototyping iPhone apps", Boston, MA Pearson.
- Goundar, M.S. and Kumar, B.A. (2021) "The use of mobile learning applications in higher education institutes", *Education and Information Technologies*, No. 27, pp. 1213–1236.
- Hjarvard, S. (2014) "Mediatization and Cultural and Social Change: an Institutional Perspective" *Mediatization of Communication: Handbooks of Communication Science*, Vol. 21., pp. 199–226.
- Ihde, D. (1990) "Technology and the Lifeworld: From Garden to Earth", Bloomington, Indiana University Press.
- Ihde, D. (2010) "Heidegger's Technologies: Postphenomenological Perspectives", New York: Fordham University Press.
- Kemp, S. (2022) "Digital 2022: April Global Statshot report", *Datareportal* [online] 21 April. Available at: <https://datareportal.com/reports/digital-2022-april-global-statshot> (Accessed: 01 January 2023).
- Krotz, F. (2007) "Mediatisierung: Fallstudien zum Wandel von Kommunikation", Wiesbaden, Verlag für Sozialwissenschaften.
- Larrieu, M. and Di Gesù, M.G. (2021) "Developing educational digital literacies among preservice teachers of Portuguese. An analysis of students' resistance in an Argentinian University", *Cultural Views on Online Learning in Higher Education, Cultural Psychology of Education*, Springer, Cham, pp. 177–185.
- Nikolopoulou, K., Saltas, V. and Tsiantos, V. (2023) "Postgraduate Students' Perspectives on Mobile Technology Benefits and Learning Possibilities: Insights from Greek Students", *Trends of High Education*, No 2, pp. 140–151.

- Okai-Ugbaje, S., Ardzejewska, K. and Imran, A. (2022) "A mobile learning framework for higher education in resource constrained environments", *Education and Information Technologies*, No 27, pp. 11947–11969.
- O'Malley et al. (2005) "Guidelines for learning/teaching/tutoring in a mobile environment", Public deliverable from the MOBILearn project (D.4.1). Available at: <https://hal.science/hal-00696244> (Accessed: 11 January 2023).
- Oosthoek, H. (2013) "Higher Education and New Technologies", Oxford, Pergamon Press.
- Petkovich, M.D. and Tennyson, R.D. (1984) "Clark's "Learning from Media": A Critique", *Educational Communication and Technology*, Vol. 32 (4), pp. 233–241.
- Poplavskyi, M. (2021) "Teacher as a media figure in modern higher education: A competence-based approach", *Linguistics and Culture Review*, No 5, pp. 904–914.
- Ray, S.K. and Saeed, M. (2015) "Mobile learning using social media platforms: An empirical analysis of users' behaviours", *International Journal of Mobile Learning and Organisation*, No. 9(3), pp. 258–270.
- Salhab, R. and Wajeeth, D. (2023) "University Students' Engagement in Mobile Learning", *European Journal of Investigation in Health, Psychology and Education*, No 13 (1), pp. 202–216.
- Snoussi, T., Belkacem, H.B., Radwan, A.F. and Gaidi, M. (2020) "Social media for learning: Perceptions and behaviors", *Periodicals of Engineering and Natural Sciences*, No 8(4), pp. 2195–2207.
- Tang, Y. and Hew, K.F. (2017) "Using twitter for education: Benefcial or simply a waste of time?", *Computers and Education*, No 106, pp. 97–118.
- Tu, C.-H. and Sujo-Montes, L.E. (2015) "Mobile Learning and Mobile Social Interaction", *Media Rich Instruction*, Springer, Cham, pp. 271–286.
- van Manen, M. (1997) "Researching lived experience: Human science for an action sensitive pedagogy", London, Althouse Press.
- Zaidi, S.F.H., Osmanaj, V., Ali, O. and Zaidi, S.A.H. (2021), "Adoption of mobile technology for mobile learning by university students during COVID-19", *International Journal of Information and Learning Technology*, Vol. 38 No. 4, pp. 329–343.
- Zhang, Y. (2015) "Handbook of Mobile Teaching and Learning", Springer: Berlin/Heidelberg.

A Case Study of YouTuber's use of Twitter for Consumer Engagement

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Abstract: Twitter as a popular social media site has become a widely used platform for brands to establish consumer engagement (CE), a connection between firms and consumers beyond product consumption and purchase. CE is important for brands to build a long-standing relationship with consumers, leading to positive marketing outcomes. Meanwhile, famous YouTubers, who have obtained large fanbases also use Twitter to connect with their viewers beyond the YouTube platform, as a part of their self-branding process. Existing studies found various strategies brands use to engage consumers on Twitter. Studies on individual users and other celebrities also found that they implement similar factors as brands for engaging their followers, suggesting the application of CE from organisations to individual bases on Twitter. However, while it can be argued that as personal brands, YouTubers also implement similar CE strategies as traditional brands on Twitter to engage their viewers as their consumers, little research has explicitly explored the CE factors implemented by YouTubers on Twitter. Therefore, by adapting the concept of CE, this research explores “How do YouTubers use Twitter for consumer engagement?”. The research implemented a qualitative case study on UK beauty vlogger Zoe Sugg (Zoella)’s Twitter account. In the study, a qualitative content analysis was performed on over 3000 tweets collected from Sugg’s Twitter via API to identify strategies implemented by Sugg that can be seen as CE factors that are also used by brands. The results show that like other brands, Sugg uses various CE factors, including interaction, information offers, topical messages, rewards, and visual elements on Twitter to engage her viewers. The research proposes that CE strategies that are used by traditional brands are also implemented by YouTubers and similar online personalities for engaging audiences on Twitter. The research contributes to understanding the building of YouTube-viewer relationships from the perspective of achieving CE on social media sites beyond YouTube.

Keywords: Consumer Engagement, YouTubers, Twitter, Social Media

1. Introduction

Twitter is commonly used by brands for consumer engagement (CE), a connection between brands and consumers beyond product purchases and consumptions (Van Doorn et al., 2010). CE helps brands to build closer relationships with consumers (Sashi, 2012), leading to positive marketing outcomes including enhanced consumer trust and retainment (Obilo, Chefor, and Saleh, 2021). Existing studies have suggested various strategies brands use to engage consumers on Twitter including replying to consumers’ tweets and the use of images and videos (e.g., Aydin, Uray, and Silahatoglu, 2021; Jansen et al., 2009).

Meanwhile, famous YouTubers, who have obtained large fan bases on YouTube also use Twitter to connect with their viewers. YouTubers were found to have ways to engage their audience within YouTube, such as interacting with viewers through video comments and sharing personal stories in videos (Zhang, 2022). However, using Twitter was found to be a part of their self-branding process (Tarnovskaya, 2017) beyond the YouTube platform.

Existing studies found that celebrities and other Twitter users implement factors that are similar to brands’ CE strategies for engaging their followers on Twitter (e.g., Java et al., 2007; Marwick and Boyd, 2011), suggesting the application of CE on Twitter from organisation to individual bases. Since personal branding mirrors traditional branding (Arruda, 2003 in Chen, 2013), it is arguable that YouTubers also implement strategies like traditional brands’ on Twitter for CE. However little research has explicitly explored YouTubers’ CE factors on Twitter. Therefore, by adapting the concept of CE, this research explores “How do YouTubers use Twitter for consumer engagement?”.

The research contributes to understanding the building of YouTuber-viewer relationships on social media sites beyond YouTube from the perspective of CE, adding to the existing literature in social media and marketing.

2. Consumer Engagement Factors on Twitter

Researchers have suggested brands’ strategies for CE on Twitter. For instance, Jansen et al (2009) suggest that brands can build CE by replying to consumers’ tweets and providing useful information. Malhotra, Malhotra, and

See (2013) indicate that brands can use topical messages (tweets about popular days and events), educational content, humanized content (messages with human tones), product deals, asking for retweets, and events notifications for CE on Twitter. Ashley and Tuten (2015) suggest brands promote product information and rewards for CE on Twitter. Aydin, Uray, and Silahtaroglu (2021) found that images, videos, and informative and interactive content have a significant impact on CE on Twitter and Facebook.

Although the above studies explored CE strategies on Twitter, they did not apply them to YouTubers. On the other hand, Java et al. (2007) and Naaman, Boase, and La (2010) demonstrated several uses of Twitter by individual users to engage others, including interacting with other users, sharing information, and posting visual content like photos. Marwick and Boyd (2011) found strategies celebrities use to engage fans on Twitter, such as replying to tweets. Some of these are like what brands do for CE on Twitter (e.g., Ashley and Tuten, 2015; Malhotra, Malhotra and See, 2013). YouTubers are individual users who are found to use Twitter for personal branding (Tarnovskaya, 2017). So, it can be argued that YouTubers implement some similar CE strategies on Twitter as personal brands to attract their viewers as their consumers. However, limited research explored the CE factors implemented by YouTubers on Twitter.

Therefore, by adopting the concept of CE, this research explores “How do YouTubers use Twitter for consumer engagement?”, by conducting a case study of the UK’s famous beauty vlogger Zoe Sugg’s main Twitter account.

3. Methods

Zoe Elizabeth Sugg (or Zoella as her YouTube name), is a UK beauty vlogger with over 11 million subscribers on her YouTube channels. Apart from YouTube, Sugg also uses other social media sites to connect with viewers, including Twitter. The research focuses on the year 2017 as an important period for Sugg when she reached over 11 million subscribers on YouTube and Twitter (Socialblade, 2022), demonstrating her success in engaging viewers and making the engagement factors to be found on her Twitter important. 3200 tweets posted in 2017 on Sugg’s main Twitter account (@ZoeSugg) ¹ were collected via Twitter API².

After collecting the tweets, the analysis consists of two steps. In the first step, the tweets were categorized into different types. Table 1 shows all types of tweets from Sugg after the categorisation. In the second step, a qualitative content analysis was conducted on the tweets in each category to identify factors that are similar to those used by brands for CE, based on existing literature on brands’ CE strategies (e.g., Malhotra, Malhotra, and See 2013; Ashley and Tuten, 2015; Aydin, Uray, and Silahtaroglu, 2021).

Table 1: Categories of Tweets Collected

Tweet Category	Description
External links	Tweets with links that lead to the external content, such as links to Sugg’s newly uploaded videos on YouTube.
Status update	Tweets that update Sugg’s stories and news in her life.
Communication	Tweets in which Sugg either encourages users to communicate with her or reacts to other users’ tweets relating to her.
Presence maintenance	Tweets for keeping Sugg’s visibility on Twitter. Such as greeting messages like “Good morning”.
Promotion and announcement	Tweets contain advertising and forecast of some activities, including the videos Sugg is about to upload on YouTube.
Photos and videos	Messages for sharing photos and videos.
Retweets	Retweeting messages from other Twitter accounts.

¹ To clarify, Sugg has changed her accounts in multiple occasions. When the research started in 2017, her main Twitter was named @Zoella, but was changed to @ZoeSugg later on. However, recently, @ZoeSugg was later removed with another @Zoella account added as her personal blog twitter account. The research results presented in this paper was based on the data collected from her main account, not the current @Zoella account searchable on Twitter.

² Twitter API: <https://developer.twitter.com/en/docs/api-reference-index>

4. Results and Discussion

Five factors were identified in Sugg's Twitter posts that can be seen as CE strategies that are also used by traditional brands - interaction, information offers, topical messages, rewards, and visual elements (See Table 2 for a summary of the findings).

Interaction is not only useful for brands to establish CE on Twitter (Aydin, Uray, and Silahtaroglu 2021; Malhotra, Malhotra, and See; 2013) but also a key for CE in general (Eslami, Ghasemaghaei and Hassanein 2022; Shawky et al., 2020; Vivek, Beatty, and Morgan, 2012). The results show that like traditional brands, Sugg interacts with her followers through tweets. These include asking viewers about new YouTube video ideas and replying to viewers' tweets.

Sugg also offers related information to her viewers. The primary form of the information offering is the promotion of videos to be or has been uploaded on her YouTube channels. It is similar to brands offering product information for CE (Ashely and Tuten, 2015), due to consumers' aim to seek information on social media (Kahn and Ahamd, 2021).

Topical messages refer to tweets about popular events, such as holidays and festivals. topical messages may make consumers feel more personally treated and affect CE (Malhotra, Malhotra and See, 2013). Similarly, Sugg posts different forms of topical messages including greetings on national days and Christmas wishes to her followers.

Rewards are a common strategy for achieving CE for brands, such as exclusive deals (Ashely and Tuten, 2015). Sugg also retweets messages from her beauty brand Zoella Beauty, which mainly contains deals and special offers such as gifts and discounts.

Finally, Sugg adds different visual elements in her tweets including photos, videos, and motion graphics (e.g., GIFs). According to researchers, visual elements can increase the richness and vividness of the tweets for brands' CE (Aydin, Uray, and Silahtaroglu, 2021; Pletikosa Cvijikj, and Michahelles, 2013; Sabate et al., 2014).

Table 2: CE Strategies in Sugg's Tweets

CE Strategies	Descriptions
Interaction	Tweets that ask viewers to perform specific actions (e.g., providing video ideas, asking questions) and replies to viewers' tweets.
Information offering	Tweets that provide information and updates that are relevant to Sugg's YouTube channels, such as new video uploads.
Topical messages	Tweets that greet viewers on holidays and public events, such as Christmas greetings.
Rewards	Retweets that contain special deals and offers, for example, from Sugg's beauty brand.
Visual elements	Tweets that contain any forms of visual elements including videos, photos, and motion graphics.

5. Conclusion

This research aims to explore how YouTubers use Twitter for CE, via a case study of Zoe Sugg's Twitter account. The results show that Sugg uses interaction, information offers, topical messages, rewards, and visual elements on Twitter for CE beyond YouTube, which are similar to the strategies used by traditional brands for CE on Twitter. The outcome initially proposes that CE strategies that are used by traditional brands are also implemented by individual YouTubers or similar online personalities for engaging their audiences on Twitter. This applies the concept of CE to individual Twitter users and contributes to the understanding of the building of YouTuber-viewer relationships beyond YouTube. Future research can study other YouTubers. Furthermore,

more quantitative methods can be used in the future to investigate the efficiency of these strategies on CE including measuring metrics such as likes and shares of the tweets.

References

- Ashley, C. and Tuten, T. (2015) "Creative strategies in social media marketing: An exploratory study of branded social content and consumer engagement", *Psychology & Marketing*, Vol.32, No.1, pp.15-27.
- Aydin, G., Uray, N., and Silahtaroglu, G. (2021) "How to engage consumers through effective social media use—Guidelines for consumer goods companies from an emerging market", *Journal of theoretical and applied electronic commerce research*, Vol.16, No. 4, pp. 768-790.
- Chen, C. P. (2013), "Exploring personal branding on YouTube", *Journal of internet commerce*, Vol. 12, No. 4, pp. 332-347.
- Eslami, S. P., Ghasemaghaei, M., and Hassanein, K. (2022). "Understanding consumer engagement in social media: The role of product lifecycle", *Decision Support Systems*, Vol, 162, 113707.
- Jansen, B. J., Zhang, M., Sobel, K., and Chowdury, A. (2009). "Twitter power: Tweets as electronic word of mouth", *Journal of the American society for information science and technology*, Vol. 60, No. 11, pp. 2169-2188
- Java, A., Song, X., Finin, T., and Tseng, B. (2007). "Why we twitter: understanding microblogging usage and communities", In *Proceedings of the 9th WebKDD and 1st SNA-KDD 2007 workshop on Web mining and social network analysis*, pp. 56-65, August.
- Malhotra, A., Malhotra, C. K., and See, A. (2013) "How to create brand engagement on Facebook", *MIT Sloan Management Review*, Vol. 54, No. 2, pp. 18-20.
- Marwick, A., and Boyd, D. (2011) "To see and be seen: Celebrity practice on Twitter", *Convergence*, Vol. 17, No. 2, pp.139-158.
- Naaman, M., Boase, J., and Lai, C. H. (2010) "Is it really about me? Message content in social awareness streams", In *Proceedings of the 2010 ACM conference on Computer supported cooperative work*, pp. 189-192, February.
- Obilo, O. O., Chefor, E., and Saleh, A. (2021) "Revisiting the consumer brand engagement concept", *Journal of Business Research*, Vol.126, pp. 634-643.
- Pletikosa Cvijikj, I., and Michahelles, F (2013) "Online engagement factors on Facebook brand pages", *Social network analysis and mining*, Vol.3, No.4, pp. 843-861.
- Sabate, F., Berbegal-Mirabent, J., Cañabate, A., and Lebherz, P. R. (2014) "Factors influencing popularity of branded content in Facebook fan pages", *European management journal*, Vol. 32, No. 6, pp. 1001-1011.
- Sashi, C.M., (2012) "Customer engagement, buyer-seller relationships, and social media." *Management decision*. Vol 50, No 2, pp. 253-272
- Shawky, S., Kubacki, K., Dietrich, T., and Weaven, S. (2020). "A dynamic framework for managing customer engagement on social media." *Journal of Business Research*, Vol. 121, pp. 567-577.
- Socialblade (2022), @ZoeSugg [online] <https://socialblade.com/twitter/user/zoesugg/monthly>
- Tarnovskaya, V. (2017) "Reinventing personal branding building a personal brand through content on YouTube", *Journal of International Business Research and Marketing*, Vol.3, No. 1, pp. 29-35.
- Van Doorn, J., Lemon, K.N., Mittal, V., Nass, S., Pick, D., Pirner, P. and Verhoef, P.C. (2010) "Customer engagement behavior: Theoretical foundations and research directions". *Journal of service research*, Vol 13, No. 3, pp.253-266.
- Vivek, S. D., Beatty, S. E., and Morgan, R. M. (2012) "Customer engagement: Exploring customer relationships beyond purchase", *Journal of marketing theory and practice*, Vol. 20, No. 2, pp.122-146.
- Zhang, H. (2022). "Behind the Scenes: Exploring Context and Audience Engagement Behaviors in YouTube Vlogs", In: Meiselwitz, G. (eds) *Social Computing and Social Media: Design, User Experience and Impact*. HCII 2022. *Lecture Notes in Computer Science*, Vol. 13315.

The Image Rights Over Social Media Profile: Whose Identity is it Anyway?

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Abstract: We live in an online identity age where employees use their creativity to make their profiles distinctive to attract clients and collaborators. Social media profiles give employees, businesses, and organisations commercial advantages in their respective markets. However, social media profiles can cause problems when employees leave organisations. It is in the interests of the employer to maintain relations with clients that are connected to an employee's profile. However, given that a social media profile is made up of personality attributes, the employee has a legal and social interest in the commercial value of their identity. This article critically assesses whether image rights can protect the social media profile as an attribute of a person's identity when the profile has been used in the course of employment. The article begins with a legal analysis that raises questions about the nature and value of a social media profile as an aspect of the right to identity under the South African law of delict. The paper concludes with recommendations on how image rights can protect the employees' interests over a social media profile even after their term of employment as their identity is inseparable from their person.

Keywords: image rights, employment, identity, commercial exploitation, social media

1. Introduction

Social media profiles give businesses and organisations a commercial advantage. Salespersons, academics, legal practitioners, and many other professionals have used their social media profiles to attract clients through social media. To establish an online presence, individuals must create public profiles on social networking sites (SNSs). SNSs request personal information for the users' profiles. Some sites expect users to reveal their identity because personal data exchange has created commodification of information on SNSs (Roos 2012; Burns 2015). Self-presentation is one of the main components of SNSs (Eisenlauer 2013). People apply creativity and effort to ensure that their profiles are publicly presented in distinctive ways to attract followers (Eisenlauer 2013; Sloan and Quan-Haase 2017).

Social media profiles can cause problems in the workplace, particularly when employees leave organisations. Consider a consultancy firm that allows its employees to use their social media profiles to communicate and transact with clients. Most employment contracts do not address the ownership of the profile in the employment contract. Some firms do not initiate or financially support the creation and maintenance of their employees' social media profiles. This raises questions about who owns a social media profile between the employer and the employee, and what becomes of the profile and clients connected to that profile upon the termination of employment. Under such circumstances, both the employee and the organisation have an economic interest in the profile.

It is in the interests of the employer to maintain relations with clients connected to an employee's profile even after the employment relationship ends. Given that a social media profile comprises personality attributes, the employee has an interest in the commercial value of their identity, which they do not desire to part with when their employment ends.

This article raises questions about whether the right to identity, or image rights, can protect the social media profile as an attribute of a person's identity when the profile has been used in the scope of employment. The paper begins with an analysis of a social media profile. This study relies on social media policies and the South African common law of delict to make this determination. It then discusses the right to identity as a personality right in South Africa and the rules for infringement and remedies that apply to this right. The paper ends with concluding remarks on how the right to identity in South Africa can protect the employees' interests over a social media profile.

2. The social media profile

Social media users cannot participate in SNSs without creating a public or semi-public profile (Eisenlauer 2013; [2014] JOL 31479 (GSJ); Roos and Slabbert 2014; Pardo, Balliu and Schneider 2017). A profile typically consists of a username or handle; an avatar or profile picture; a wall picture; distinctive hashtags (Heyd and C Puschmann 2017); an individual's real name, surname, date of birth, location, education, professional experience; and the user's network of family, friends, colleagues and clients (Roos 2012; Eisenlauer 2013; [2014] JOL 31479 (GSJ); Roos and Slabbert 2014; Sadleir and De Beer 2014; Ghazinour and Ponchak 2017; McGrady 2019). Therefore,

the profiles found on SNSs represent multiple facets of people's online and offline identities (Eisenlauer 2013; Drucker and Gumpert (eds) 2013). When a profile is created, it is annotated on search engines using a unique link. This link redirects anyone who searches for a person's profile on a search engine to the SNS hosting that profile. Regardless of any changes in the names and photographs on the profile, the link remains the same.

Different SNSs request similar information for the users' profiles, which helps users to maintain the same representation of their personalities throughout the different networks. Some sites expect users to reveal their identity because personal data exchange has created commodification of information on SNSs (Roos 2012; Burns 2015). Meanwhile, other sites openly encourage users to provide pseudonyms for their accounts (Eisenlauer 2013). Certain social media profiles of ordinary people can attract many likes and follows due to their distinctiveness. These personalities are often called social media celebrities or influencers (Allen 2012). Businesses have even paid social media influencers to market their brands by displaying their trademarks and logos in their social media posts. This shows that the social media identity has economic and commercial value (Mashinini 2021).

The information that users provide online allows them to carefully determine the social aspects that make up their personalities (Eisenlauer 2013; Mangan and Gillies 2017). Social media users derive pleasure and income from sharing content with their networks. Users interact by either initiating a post or commenting on another user's post, and in turn, convert their followers into clients. The content that individuals publish on their profiles, as well as the comments they make on other people's posts equally contribute to their self-presentation and commercial use and exploitation (Eisenlauer 2013). A user's profile is public but the extent to which the world can access each profile depends on the network's policy and the privacy settings chosen by the user (Eisenlauer 2013; Roos and Slabbert 2014; Senthil, Saravanakumar and Deepa 2016; Heravi, Mubarak and Choo 2018; McGrady 2019; Schwartz-Chassidim 2020). As such, these online profiles are an extension of people's actual personalities that ought to be legally protected. Their distinctiveness could be one point of consideration that expose the legally protectable interests that exist in the social media profile. After all, the presentation of 'the self' is viewed as one of the main components of SNSs. Despite the evolution of social media, the law of personality in South Africa has not been developed to explicitly recognise the social media profile as an object of personality rights, and specifically of the right to identity.

2.1 The nature of a social media profile

The legal nature of a social media profile is not precise (Mangan and Gillies 2017). Social media profiles are not explicitly classified as legal objects under South African law. If the social media profile is a legal object, it would probably find protection under immaterial property rights or personality rights. Immaterial property rights can be copyright or trademarks (Mangan and Gillies 2017). However, the proposition that a social media profile is a brand or literary and artistic work falls outside of the scope of this paper. Instead, this study is about a social media profile as an object of personality rights. The object of personality rights is human personality and the attributes of their identities (Neethling, Potgieter and Roos 2019). We now live in a world where even an avatar has become an increasingly important component of identity. Therefore, this research aims to discover whether the social media profile can bear personality rights, specifically the right to identity (Neethling, Potgieter and Roos 2019). First, an analysis of the value of a social media profile is laid out to reveal the commercial aspects thereof.

2.2 The commercial value of the social media profile

The answer to whether a social media profile has value is found through understanding when an individual interest becomes a legal object. On the one hand, the interest must provide some use or value to the individual. But the interest must have some measure of distinctiveness, definiteness and independence to allow disposal and enjoyment (Neethling, Potgieter and Roos 2019).

Ordinary people incidentally become social media influencers in the employment or careers that they form part of. They start by gaining likes and followers and eventually receive recognition as leaders in their fields (Heravi, Mubarak and Choo 2018). The appearance of a profile helps to gain more followers. More followers provide the possibility that the users' content will be liked and shared by a vast audience. This produces a lot of data that makes up the whole person's image or personality. Social media profiles have also become one of the most common ways of ensuring sustenance through entrepreneurship and vocation. (Matyka et al, 2013). Therefore, there are clear personality interests in the social media profile, and sometimes, individuals have a patrimonial interest in their social media profiles, especially those who use their social media profiles to advance their careers even as influencers in their disciplines and fields.

Statistical information on a profile can determine how much of an audience that person can influence and attract to their platform. Advertisers have noticed the advantages of sponsoring social media influencers and paying them for publicly testing and reviewing their products using videos and pictures uploaded on their profiles. The number of views likes, and shares that a user can generate per post is an indicator of their reputation and estimated audience. It seems social media profiles are operating much like television channels that offer some screen time to advertisers in exchange for money. This reveals that organisations indirectly derive monetary gain from social media profiles. These indicators are an essential aspect that makes up the economic value of the social media profile.

Personal branding has become a major tool for social media users. Tagging is the main drive used to spread engagement. For instance, an organisation can tag its employees to make a post more visible to friends and connections that are in the employees' networks. Tags connect people easily as they create a form of affiliation and bond between two or more people. The challenge comes in when tagging creates a false impression that a social media user agrees with or is affiliated with a product, group, page, or brand they are not affiliated with. For example, when an employee leaves the organisation, no affiliation exists anymore between the employer and employee but people who see the tag at a later stage may still be influenced to take an interest in the organisation. The employee whose identity intrigues a potential client thus provides value to the organisation, which also reveals a legitimate interest that is protectable through personality rights.

3. The right to identity over the social media profile

3.1 Grounds for recognition

It is unknown whether a South African court would give a remedy to a person who claims identity infringement on the grounds of unlawful appropriation of their social media profile. The law of personality has not been developed to explicitly recognise the social media profile as an object of personality rights, and specifically of the right to identity. The social media profile has no direct formal legal protection in South Africa. Nevertheless, there is legal protection in various jurisdictions provided for image rights through common law torts, delicts, statutes, and social media policies.

This section discusses whether a social media profile creates a new distinct part of a person's identity which must be legally recognised as part of their personality, and thus an object of image rights protection. Admittedly, it is impossible to use SNSs without creating social media profile that comprises the *indicia* of identity. The *indicia* that make up a person's identity include aspects of personality such as name, likeness, photos, life history, character, creditworthiness, voice, physical appearance, and handwriting (Neethling, Potgieter and Roos 2019; Louw 2007; Neethling 2009; Cornelius 2011; Neethling, Potgieter and Roos 2015). The recognition of image rights on social media can be advanced to the profile based on the components that are objects of this right. The social media profile is analogous to a person's identity as it identifies and distinguishes them from all other users on SNSs (Neethling, Potgieter and Roos 2019).

Every personal interest originates from the reality that a particular individual interest factually exists (Neethling, Potgieter and Roos 2019). The social media profile is an object of the right to identity that factually exists, but the legal recognition of the factual interest bestows protection over that interest by providing a right to protect it (Neethling, Potgieter and Roos 2019). Without recognition, people's profiles, or parts thereof, are used in various ways that can amount to commercial exploitation, appropriation, misrepresentation, or falsification of their identity. This conduct may amount to a form of aggression against a person's dignity. Therefore, as people's identities develop online, so must the recognition thereof develop. It is arguable that the use of a person's social media profile, be it by a previous employer, or current or prospective one, amounts to a misappropriation of identity (*Grütter v Lombard* par 13).

Employers, much like marketers, are often challenged because they want to use people's images to attract those who relate to that image to buy their goods and services. This trend has been seen on social media, but it is known even in offline instances (For instance, see *Grütter v Lombard* where an attorney claimed the removal of his name from the premises of a colleague's business with whom he was previously associated). With a social media profile, one may see that using a person's profile to gain profit, or mere fixation to gather clients could amount to an indirect intention to violate identity.

The employer operates on the basis that the social media profile created by the employee holds commercial value and attracts social media traffic to provide commercial gains for their business. Thus, the use of the profile without consent could amount to an indirect intention to violate the employee's identity. The employer would be aware that to publish a post that takes advantage of their employee's profile, that social media profile would

have to be appropriated or subjected to individual or mass publication through tagging, reposting, and sharing. Nonetheless, it should be noted that using a person's photograph to gain a commercial advantage can attract delictual liability without the social media profile being recognised as an *indicium* of identity (Neethling, Potgieter and Roos 2019; Louw 2007; Neethling 2009; Cornelius 2011; Neethling, Potgieter and Visser 2015).

3.2 Regulated conduct and grounds of justification

The right to identity protects a person from the degradation, humiliation, and insult against their person through the misappropriation, falsification, and commercial exploitation of their identity features. The duplication of these features on social media may also be misappropriated. For instance, a university poster that uses the deans' images in a poster and tags their social media profiles without their consent amounts to misappropriation. Such an instance can be justified in the employment relationship under responsibilities that deans may have towards their schools.

However, it is questionable whether these profiles can still be tagged once the deans are no longer affiliated with their faculties. In the latter context, *prima facie*, falsification arises in the eyes of those who are unaware of a terminated employment relationship. Falsification is the creation of a false impression that a relationship exists between the two parties or that the persons in a publication agreed to appear therein (*Kumalo v Cycle Lab* par 17). In the employer's defence, the context within which the publication was created is grounds for justification, but the justification can only stand if it is reasonable. Should a publication that affiliates the organisation and employee remain published within a reasonable time after the employee's departure, there would be no violation of the right to identity. It would only be reasonable to hold an employer liable for falsification in instances where the latter tags a person's profile even after a reasonable time has lapsed and no existing employer-employee relationship can be proven.

Furthermore, the use of a social media profile may be commercial exploitation. None of the courts in South Africa decisively addressed what commercial exploitation or gain means. There is room for interpretation that the followers, number of likes and interactions on social media are a form of gain, although the monetary nature of those gains is not immediately realised (Mashinini 2021). If this view is adopted, it creates a basis to hold employers liable when they use their employees' profiles for marketing without their consent or beyond the scope of their consent. In turn, this recognition can deter employers from using their employees' profiles to draw attention to their businesses. As such, the profile on social media requires protection because it is an extension of the employee's personality which they depart with upon termination of employment. Any part of their personality and being that was distinct and attractive for business is unique to them and not open to anyone to perpetually exploit. These days social media profiles of ordinary people can attract many likes and followers due to their distinctiveness. Thus, the social media profile has an economic and commercial value that is worthy of legal protection (Neethling, Potgieter and Roos; Adrian 2020).

4. The need for development

The right to identity is not explicitly recognised in the Constitution, but it is protected under the right to dignity (s10 of the Constitution of the Republic of South Africa, 1996; Neethling, Potgieter and Roos 2019). Consequently, the right to identity ought to be developed to give force to the right to dignity as a constitutional right and value. Public policy considerations also call for developing identity in line with the Constitution, since people use their personalities to generate an income and to market goods. This is the realisation of people's right to trade (s22 of the Constitution of the Republic of South Africa, 1996). If the right to identity over a social media profile is based on dignity, the courts should find no challenge in legally and reasonably concluding that such a profile can be the object of individual rights of personality such as privacy, identity, and dignity.

As illustrated in paragraphs 2.2 and 3.1, there is a non-legal and legal entitlement over social media profiles which ought to be recognised in South African law. This notion is already gaining limited and indirect recognition in the USA (*Eagle v Morgan and Others* Civ. No. 11-4303 (E.D. Pa. Mar. 12, 2013)). In the *Eagle* case, Dr Linda Eagle, the plaintiff, was a doctoral graduate in communications, business and psychology from Temple University. Together with With Clifford Brody, Dr Eagle founded a company, Edcomm Inc (Edcomm) which is a banking education company that provides services online and in person to the banking community. Dr Eagle was well-known and published in the banking industry publications, quoted in newspapers and magazines, and presented at industry conferences around the world. In 2010, a company named SISCOM purchased all the outstanding common shares of Edcomm. Edcomm began using LinkedIn as a sales and marketing tool in 2009. Edcomm began urging but did not require, its employees to create LinkedIn accounts and developed policies to cover online content. It provided guidelines for employees who wanted to maintain LinkedIn accounts. Eagle created her LinkedIn account using her Edcomm email address. However, Edcomm never paid

for the account and neither did the company subsidise its maintenance. According to the LinkedIn user agreement, the account belonged to Eagle and she was individually bound thereto. In 2011, Eagle and two others were involuntarily dismissed from Edcomm, by the head, Haitham Saeed. Thereafter, Edcomm allegedly used Dr Eagle's LinkedIn account to her economic detriment.

Edcomm had not adopted a policy to inform employees that their LinkedIn accounts were the property of the company. Dr Eagle's password for her LinkedIn account was granted, by her, to some employees for them to respond to certain queries through her account during her term of office at Edcomm. However, when she left the company, some employees who remained at Edcomm accessed the account and changed the password, gaining full control of the account. Thereafter, the account depicted the name, picture, education and experience of a new employee, Sandi Morgan, the defendant. Some information relating to Dr Eagle had not been deleted from the account. During this period, a Google or LinkedIn search for "Linda Eagle" would redirect to Dr Eagle's account, which now bore the name, picture, and credentials of Sandi Morgan. Dr Eagle claimed damages of \$248 000 based on eleven causes of action, including unauthorised use of a name under Title 42 of the Pennsylvania Consolidated Statutes (Pa.C.S.), and misappropriation of publicity.

The court had to establish whether Morgan and Edcomm has misappropriated Dr Eagle's publicity and used her name in contravention of the Pa.C.S. Buckwalter J held that the plaintiff sufficiently proved the elements of her claim and gave ample testimony that the name Dr Linda Eagle has commercial value due to her investment of time and effort in developing her reputation in the banking education industry. She also proved that the defendant had used her name without her consent for commercial and advertising purposes because anyone who would search her name on Google or LinkedIn would be unwillingly redirected to the defendant's profile and affiliated with Edcomm, despite Dr Eagle no longer being at Edcomm. Thus, the court held that Edcomm obtained commercial benefits from using Dr Eagle's name to promote the services of its business. This revealed improper use of her name and violated the Pa.C.S.

Turning to misappropriation of publicity, Buckwalter J held that Pennsylvania recognises a right of publicity which grants a person the exclusive entitlement to control the commercial value of his or her name or likeness to prevent others from exploiting it without permission. The right protects against commercial loss caused by the appropriation of a name or likeness. The court further distinguished the right of publicity from that of privacy. The court laid out that invasion of privacy by the appropriation of name or likeness is a personal right created to protect privacy, while publicity more closely resembles a property right created to protect commercial value. The court found that the defendant had committed a tort of misappropriation of publicity because the plaintiff maintained an exclusive right to control the commercial value of her name and to prevent others from using it. By using the plaintiff's password to enter her LinkedIn account, changing the password and blocking her out and then altering the account to reflect Morgan's details instead of simply creating a new LinkedIn account for Morgan, Edcomm effectively deprived Dr Eagle of the commercial benefit of her name. Edcomm appropriated promotional benefits for itself in a tortious way by appropriating Dr Eagle's name for commercial use.

This judgment shows how valuable the social media profile is, especially when used to generate profit and reputation. The profile is inextricably linked to a person's identity, as illustrated by Eagle's case above. Online identity is just as important in the modern world as your offline personality. The social media profile is inextricably linked to personality and cannot be excluded from the attributes of one's identity, making it an object of image rights.

South African courts could rely on the *Eagle* case to adjudicate similar matters. Section 39(1)(a) of the Constitution requires the courts to consider foreign law when applying the Bill of Rights (s39(1)(c) of the Constitution of the Republic of South Africa, 1996). This is typically the approach in cases dealing with social media and image rights, to inform the courts' decisions since little attention has been given to these areas of law in South Africa (s39(3) of the Constitution of the Republic of South Africa, 1996; *Grütter v Lombard*). Looking at the common law regulation of the right identity, it is arguably unconstitutional for any employment policy or agreement to deprive employees of their profiles. The social media profile comprises almost all the elements of a person's identity features, and is thus, inseparable from that person.

5. Conclusion

In a social media world where verification services are available at a fee, it may well be time to clear up the question, who is the owner of the social media profile that is used in the course of employment? Identity is inextricably linked to one's personality. It is part of a person that cannot be severed from their being.

Employment contracts that attempt to regulate the position using contractual terms may have to face a legality issue regarding such clauses. Only the development of legal rules can limit exploitation in this context but the societal behaviours that have led to this commercialisation of social media profiles will continue to evolve, and as such, the law must also evolve.

Acknowledgements

This work is based on the research supported wholly / in part by the WITS Chancellor's Female Academic Leaders Fellowship. Chancellor's Fellows acknowledge that opinions, findings, conclusions, or recommendations expressed in any publication generated by the FALF supported research are that of the author(s), and that FALF accepts no liability whatsoever in this regard.

References

- Adrian, A. "Image is Everything™: The New Image Right of Guernsey" (2013) (<http://www.icondia.com/about-image-rights/digital-personalities/> accessed on 21 May 2020).
- Allen, RE. (ed) *The Concise Oxford Dictionary of Current English* (2016) Oxford University Press: Oxford.
- Burns, Y. *Communications Law* 3rd ed (2015) LexisNexis: Cape Town.
- Christou v Beatport*, LLC No. 10-cv-02912-RBJ-KMT.
- Constitution of the Republic of South Africa, 1996.
- Cornelius, S. "Commercial appropriation of a person's image: *Wells v Atoll Media (Pty) Ltd* (Unreported 11961/2006) [2009] ZAWCHC 173 (9 November 2009)" (2011) 14 *Potchefstroom Electronic Law Journal* 182-205.
- Davey, R., and Dahms-Jansen, L. *Social Media in the Workplace* (2017) LexisNexis: Durban.
- Drucker, SJ., and Gumpert, G., (eds) *Regulating Social Media: Legal and Ethical Considerations Volume 2* (2013) Peter Lang Publishing: New York.
- Eagle v Morgan and Others* Civ. No. 11-4303 (E.D. Pa. Mar. 12, 2013).
- Eisenlauer, V., *A critical hypertext analysis of social media: The true colours of Facebook* (2013) Bloomsbury Publishing Inc: London.
- Ghazinoor, K., and Ponchak, J., "Hidden Privacy Risks in Sharing Pictures on Social Media" (2017) 113 *Procedia Computer Science* 267-272.
- Hays Specialist Recruitment (Holdings) Ltd and Another v Ions and Another* [2008] EWHC 745 (Ch), 2008 WL 2443198.
- Heravi, A., Mubarak, S., and Choo, KR., "Information Privacy in Online Social Networks: Uses and Gratification Perspective" (2018) 84 *Computers in Human Behavior* 441-459.
- Heroldt v Wills* [2014] JOL 31479 (GSJ).
- Heyd, T., and Puschmann, C., "Hashtagging and Functional Shift: Adaptation and Appropriation of the #" (2017) 116 *Journal of Pragmatics* 51-63.
- Louw, AM., "Suggestions for the protection of athletes and other famous persons against authorised celebrity merchandising in South African Law" (2007) 19 *South African Mercantile Law Journal* 272-301.
- Malgieri G., and Custers B., "Pricing Privacy – The Right to Know the Value of Your Personal Data" (2018) 34 *Computer Law and Security Review* 292.
- Mangan, D., and Gillies, LE., (eds) *The Legal Challenges of Social Media* (2017) Edward Elgar Publishing: Cheltenham.
- Mashinini, TN. *The Recognition of Image Rights in the Context of Memes Shared on Social Media* (2021) LLD thesis, University of Pretoria
- Matyka et al, *Company Success among German Internet Start-ups: Social Media, Investors and Entrepreneurs' Personalities* (2013) Disserta Verlag: Hamburg.
- McGrady, PD. *McGrady on Social Media* (2019) Matthew Bender and Company Inc: New York.
- Midgley, JR. 'Delict' in Joubert, WA. and Faris, JA. (eds) *The Law of South Africa* (2016) Volume 15 LexisNexis: Durban.
- Neethling, J. 'Personality Infringement' in Joubert, WA. and Faris, JA. (eds) *The Law of South Africa* (2009) Volume 20 (Part 1) LexisNexis: Durban.
- Neethling, J., Potgieter and Roos, A., *Neethling on Personality Rights* (2019) LexisNexis: Durban.
- Pardo, R., Balliu, M., and Schneider, G., "Formalising Privacy Policies in Social Networks" (2017) 90 *Journal of Logical and Algebraic Methods in Programming* 125 -157.
- Pennsylvania Consolidated Statutes (Pa.C.S.). Civ. No. 11-4303 (E.D. Pa. Mar. 12, 2013).
- PhoneDog v Kravitz* No. C 11-03474 (ND Cal. Nov. 8, 2011).
- Presthus, W. and Vatne, DM. "A Survey of Facebook Users and Information Privacy" (2019) 164 *Procedia Computer Science* 39-47.
- Roos, A. and Slabbert, M. "Defamation on Facebook: *Isparta v Richter* 2013 6 SA 529 (GP)" (2014) 17(6) *Potchefstroom Electronic Law Journal* 2845-2868.
- Roos, A. "Privacy in the Facebook era: A South African Perspective" (2012) 129 *South African Law Journal* 375-402.
- Sadler, E. and De Beer, T. *Don't Film Yourself Having Sex and other Legal Advice for the Age of Social Media* (2014) Penguin Books: Johannesburg.
- Schwartz-Chassidim, H., Ayalon, O., Mendel, T., Hirschprung, R., and Toch, E., "Selectivity in Posting on Social Networks: The Role of Privacy Concerns, Social Capital and Technical Literacy" (2020) 6 *Heliyon* 1-11.

Senthil, N.K., Saravanakumar, K. and Deepa, K. "On privacy and Security in Social Media – A Comprehensive Study" (2016) 78 *Procedia Computer Science* 114-119.

Sloan, L., and Quan-Haase, A., *The SAGE Handbook of Social Media Research Methods* (2017) SAGE Publications Ltd: London.

Late Submissions

Sovereign Wealth Funds' (SWFs') Social Media Strategies

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Abstract: It is estimated that there are currently 100 major Sovereign Wealth Funds (SWFs) in operation worldwide, which command an asset total of some US\$10.31tr (SWFI, 2023). SWFs are thus the largest class of nontraditional (alternative) pooled investment vehicles by assets under management (outstripping by far more conspicuous hedge-, private equity- or exchange traded funds (TheCityUK, 2021). Although SWFs tend to pursue a variety of objectives or their combinations: efficient management of foreign exchange (f/x) reserves, socioeconomic development, pension reform, macroeconomic stabilization and direct investments, their overriding goal is an intergenerational transfer of wealth – in conformity with the tenets of sustainable development (Brundtland, 1987). Despite fiduciary mandates to manage the savings of entire countries, states or provinces, SWFs tend to be highly opaque - their information disclosures performed via traditional media are scrumpy, infrequent and irregular. Most SWFs, although theoretically accountable to their societies, including the future generations of their beneficiaries, tend to shy away from social media engagement, i.e. the very media that such beneficiaries will increasingly use. The primary hypothesis set and examined in this research is thus a pervading and chronic lack of proactive social media policies by most SWFs. Although 78 SWFs maintain proprietary websites and some even use selected social media platforms to promulgate user-oriented content, they fail to engage societies (their primary stakeholders) in any form of interactive dialogue or accountability. SWFs' use of social media is thus primarily geared to disseminating self-selected scraps of information without any pretense to comprehensiveness, regularity and interactivity. The paper empirically examines the social media strategies of most active SWFs and their role in enhancing the social accountability of their operations. The research also raises the need for more public awareness of SWFs' objectives and activity.

Keywords: sovereign wealth funds, social media, information disclosures, transparency, social accountability, sustainability, governance

1. Introduction

Sovereign wealth funds (SWFs) are considered the largest class of alternative (non-traditional) pooled investment vehicles (a.k.a. collective investment schemes) by assets under management (TheCityUK, 2021). SWFs, fueled by burgeoning foreign exchange reserves owed to commodity exportation, brisk economic growth or both, have largely defied the ebb and flow of asset values experienced during the 21st century by most global asset managers (including the Global Depression of 2007-2009 and the recent COVID-19 pandemic). The stellar rise of SWFs has prompted observers and researchers to investigate their inherent traits and motives, a daunting task in light of these funds' perennial opacity.

Based on empirical evidence and in spite of limited transparency, SWFs tend to exhibit several distinctive hallmarks (Wiśniewski, 2018), (Al-Hassan *et al.*, 2013). To be considered independent asset managers, SWFs have to operate on the back of a clearcut *fiduciary mandate* whereby a separate asset pool is delegated to them and ring-fenced away from the holdings of other state-managed bodies managing f/x reserves, e.g. central banks or finance ministries. Furthermore, and in line with their very definition, SWFs are established by sovereigns, and, to be reasonable, the original decision to set up an SWF should be premised on and preceded by an in-depth macroeconomic *cost-benefit analysis (CBA)*, otherwise it smacks of pointless "mental accounting" (Thaler, 1990) best summed up by an English adage "to rob Peter to pay Paul". For SWFs to earn their keep, the funds should strive for competitive, long-run returns benchmarked against risk (usually quantified via volatility) and the ongoing *performance* of other investment managers (both public and private). Most socially accountable and responsible SWFs will thus endeavor to demonstrate competitive returns based on the opportunity cost of capital. Numerous SWFs tend to invest internationally which, in view of their sizable portfolios, implies the quest for substantial cross-asset and cross-country investment heterogeneity and *productive diversification*. SWFs display unparalleled *long-termism*; their investment horizons (spanning decades or even centuries) enable them to extract illiquidity premiums from asset classes devoid of a vibrant secondary market and thereby shunned by most competitors – including financial institutions. Last but not least, the majority of SWFs promote an intergenerational transfer of wealth: numerous SWFs foster financial solidarity among generations, which ties back into the paradigm of sustainable development (Sharma 2017).

To comprehend the roles SWFs play in modern societies, it is helpful to catalogue missions typically espoused by SWFs. They usually go beyond the sheer pursuit of risk-adjusted efficiencies and routinely involve one of more socioeconomic objective(s) (Wiśniewski, 2018) discussed hereunder.

Intergenerational solidarity and intergenerational equity are central to the concept of sustainable development, i.e. fervent belief that “Humanity has the ability to make development sustainable to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs” (Brundtland, 1987). This most fundamental and rudimentary role played by SWFs helps ensure a transfer of wealth so as to let future generations reap the benefits of nonrenewable commodity extraction or export-driven, rapid economic growth. In prioritizing this goal, SWFs recognize the transient nature of f/x reserves and necessity to safeguard their purchasing power for generations to come. Conceptually, intergenerational solidarity hinges on social contract theory (Bengtson and Oyama, 2007) and an adequate, self-imposed discipline to forgo part of current consumption and transfer it into the future, a formidable challenge to most democracies.

Efficient management of (f/x) reserves is expected to enhance the quality of SWFs’ investment returns in risk-adjusted terms. Empirical evidence has demonstrated the statistical superiority of passive over active investment and private over state-owned asset management (Bharali, R. *et al.*, 2022). Yet, in certain cases and assuming the professionalism of the recruitment process, career progression and performance-related remuneration, certain SWFs have managed to live up to these expectations, especially with comparison to the purely saving character of f/x assets held by central banks.

Socioeconomic development is an SWF function whose scope is relatively broad: improved labor efficiency, international competitiveness, macroeconomic expansion, technical modernization, industrial diversification and leadership, welfare systems, job creation, environmental, social and governance enhancement (ESG) but can be broken down into subsets of productive enhancement: hard (material) and soft (human) infrastructure.

Pension reform: SWFs are trying to plug the gap in most contemporary retirement systems whose replacement ratios (measured as the first pension related to the last salary) are dramatically low and are set to sunk even further. Such SWFs are providing an additional mechanism of state-sponsored reallocation of current resources to future target dates when a total collapse of the retirement system appears to be conceivable (Cottarelli, 2011). The assumption being made is that neither public nor private pension plans will be sufficient to provide adequate retirement security or living standards.

Macroeconomic stabilization: SWFs strive to reduce macroeconomic volatility by focusing on one of the following policies: monetary, fiscal and trade. In this vein, state interventionism can be used to mitigate risks related to budget deficits, commodity prices, trade deficits, external shocks and catastrophic events, including pandemics (Wiśniewski, 2023).

Direct investment: SWFs play roles analogous to the private equity limited partners (LPs), essentially – financial institutions, coinvesting alongside general partners (GPs), i.e. portfolio company management teams, into nonpublic equities throughout the entire lifecycle of such projects: all the way from venture capital (seed capital and startup phases) through grown and expansion stages, all the way to management buy outs (MBOs).

Evidently, all these roles imply social costs and benefits as well as require substantial cornerstone expenditure, therefore a high degree of transparency and accountability should be expected. This paper will examine whether these standards are met by SWFs, especially with regard to social media strategies.

2. Motivation for this research

The author’s motivation for the paper is threefold and stems from the following logical consequence: 1) if SWFs are the world’s *largest* nontraditional (alternative) *pooled investment vehicles* whose overriding objective is a socioeconomically beneficial and sustainable *intergenerational transfer of national wealth*, and 2) if such an intergenerational *social contract* has far-reaching *implications* for the populations and other stakeholders involved, then 3) SWFs should engage them in all *effective ways*, including *social media*, especially in view of the increasing popularity of that media *genre*. Failure to do so can be considered socially irresponsible and unaccountable.

3. SWFs’ accountability and transparency

The job of a well-designed and lucid corporate governance system is to maximally align the objectives of all (internal and external) stakeholders and minimize frictions among them, although “inter-functional” conflicts (existing within stakeholder groups) also matter (Carney *et al.*, 2010). SWFs, as other financial institutions, are a

powerful stakeholder class, whereas their impacts on portfolio companies as well as on other stakeholders and fellow SWFs are complex and multifaceted (Aguilera et al., 2016).

As shown in Figure 1, (Al-Hassan et al., 2013), an SWF's *governance* framework overlaps other pivotal elements of SWF policymaking, such as: *objectives* (socioeconomic and not necessarily financial), *investment strategy* (strategic and tactical asset allocation) and *reporting* (information disclosure routines). None of these elements can exist in isolation to the others and – as with most ecosystems – it is their synergies and spillovers that determine the overall success or failure of SWF operations.



Figure 1: Main Elements of SWF Policy

Source: Al-Hassan et al. (2013).

SWFs' transparency is a key driver of the funds' social responsibility and accountability. As societies are their SWFs' original and ultimate mandators, they have every right to comprehend and monitor the SWFs' behavior. Various forms of SWF transparency can be identified, as such funds need to inform all other stakeholders of numerous factors related to their intricate workings. Dixon (2014) identifies the following subsets of SWFs' openness (as well as their relevant objectives and methods of compliance):

Table 1: Framing SWF Transparency

Form of transparency	Objectives	Methods
Political	- To clarify the policy goals of the SWF - To clarify the relationship of the SWF vis-à-vis the state	- Mission statement - Legal framework
Procedural	To clarify the governance architecture of the SWF	- Board selection procedure (inc. requisite qualifications) - Internal and external delegation procedures - Corporate engagement procedures
Policy	To clarify the rules and objectives imposed on decisionmakers in implementing an investment mandate	- Disclosure of internal and external mandates - Corporate engagement policy
Operational	To clarify the way an investment strategy is implemented and by whom	- Disclosure of internal and external mandates - Disclosure of asset allocation, specific investments, and intended holding periods - Corporate engagement actions
Performance	- To clarify the investment outcomes achieved by the fund - To clarify how investment outcomes serve policy goals	- Short- and long-term performance metrics - External audits - Qualitative assessment of investment activities - Qualitative assessment of organizational culture and effectiveness

Source: Dixon (2014).

Despite a deficit of scientific literature devoted to SWFs' use of social media, a number of initiatives have been launched to assess and help upgrade SWFs' information policies involving traditional media. Among such initiatives have been the SWF Scoreboard (Truman, 2007), the Santiago Principles (IWG, 2008) and The Linaburg-Maduell Transparency Index (Linaburg and Maduell, 2008, 2023). Unsurprisingly, these initiatives happened to proliferate during the Great Depression of our time when SWFs' investments (including bailouts or opportunistic acquisitions) gained plenty of traction. In this paper, arguably the most conceptually advanced and synthetic metric (The Linaburg-Maduell Transparency Index, on a scale from 1 to 10) has been used as a yardstick of SWFs' general standards of transparency. Its equally-weighted components are contained in Table 2.

Table 2: Linaburg-Maduell Transparency Index Methodology

Point	Principles of Linaburg-Maduell Transparency Index
1	Fund provides history including reason for creation, origins of wealth, and government ownership structure
1	Fund provides up-to-date independently audited annual reports
1	Fund provides ownership percentage of company holdings, and geographic locations of holdings
1	Fund provides total portfolio market value, returns, and management compensation
1	Fund provides guidelines in reference to ethical standards, investment policies, and enforcer of guidelines
1	Fund provides clear strategies and objectives
1	If applicable, the fund clearly identifies subsidiaries and contact information
1	If applicable, the fund identifies external managers
1	Fund manages its own web site
1	Fund provides main office location address and contact information such as telephone and fax

Source: LMTI (2008, 2023).

4. Rationale for SWFs' use of social media

The relevance of SWFs to social media might at first seem counterintuitive. After all, some SWFs' history is measured in centuries, whereas most social media have records spanning merely years or (maximally) decades. Furthermore, SWFs by virtue of their state-sponsored mandates are conservative in traditional (let alone social) media usage. Limited social accountability and self-imposed confidentiality can also prompt SWFs to be secretive and particularly economical with social media uptake. Lastly, social media interaction can be deemed "trivial" or downright "frivolous" by many established SWFs. The yawning age chasm between SWFs' average decisionmakers and social media's average audience (i.e. SWFs' future beneficiaries) can also furnish a plausible explanation.

Nevertheless, espousal of social media by SWFs is nowadays a natural form of enhanced social outreach. A few persuasive arguments support this claim. Firstly, SWFs owe their fiduciary mandates to societies and in most accountable political regimes their operations come under ongoing executive, legislative or (even) judicial scrutiny and oversight (the "social" dimension of SWFs work is thus evident). Secondly, SWFs ought to keep their societies comprehensively informed of their activities via effective channels of communication – given the stellar ascent of social media – this channel appears to be particularly relevant. Thirdly, SWFs must increasingly cater to "digital natives" (Barlow, 1995) – as they will represent the potential long-term beneficiaries of SWF investments as eventual asset drawdowns are performed: social media disclosures and online engagements are particularly well suited to digital natives' needs and expectations. Lastly, social media foster standards of interactivity unachievable by other (classical) media – this factor makes them an ideal two-way communication tool for promoting meaningful dialogue via online social engagement.

Regrettably, there is scant evidence of scientific literature focused on the role played by social media in SWFs' activities. Schena and Chaturvedi (2017) have examined that role via SWFs contributions to (co)funding innovation in social media startups. This research echoes other plentiful empirical evidence of SWFs increasingly emulating the success of private equity funds (Nowacki and Monk, 2017), however, with more exposure to private equity (venture capital) portfolio companies engaged in digital disruption.

Another genre of the social media-SWF interface examined in scholarly literature and mentioned in this paper concerns SWFs' actions deemed noteworthy from the perspectives various stakeholders, including fellow SWFs, and covered by social media. This train of thought is also irrelevant to our Leitmotiv of SWFs' deliberate and consistent information policymaking using social media.

Lastly (and most importantly), the author has not identified a single prior scholarly publication whose theme would touch on the social media policies of worldwide SWFs (or, broadly, SWFs' use of social media for any

systematic information disclosure). That is a fourth argument for writing this research (in addition to the three highlighted at the beginning of this paper).

5. The methodology overview

To assess SWFs' social media engagement, core activity drivers and online interaction characteristics, data have been independently compiled and reviewed by the author of this paper for the largest 100 SWFs by assets under management (SWFI, 2023). The multilingual data have been derived from the SWFs' websites, report hardcopies, traditional and social media releases, information disclosures of the SWFs' sovereigns, government agencies, regulatory bodies and numerous thinktanks which aim to cover SWF activity. In the event of discrepancies among these sources, cross- and factchecks have been made by the author to maximize data reliability. The initial assumption made and pursued throughout the paper is that all data used herein come from public sources and are in the public domain.

Appendix 1 comprises all 100 SWFs active globally. To economize space, SWF acronyms have been used throughout this appendix – which encapsulates key social media drivers for all major SWFs. The SWFs covered are: China Investment Corporation: CIC, Norway Government Pension Fund Global: NBIM, Abu Dhabi Investment Authority: ADIA, Kuwait Investment Authority: KIA, GIC Private Limited: GIC, Public Investment Fund: PIF, Hong Kong Monetary Authority Investment Portfolio: HKMA, Temasek Holdings: Temasek, Qatar Investment Authority: QIA, National Council for Social Security Fund: NCSSF, Investment Corporation of Dubai: ICD, Turkey Wealth Fund: TVF, Mubadala Investment Company: Mubadala, National Welfare Fund: NWF, Korea Investment Corporation: KIC, Abu Dhabi Developmental Holding Company: ADQ, National Development Fund of Iran: NDF, Future Fund: AFF, Alberta Investment Management Corporation: AIMCO, Emirates Investment Authority: EIA, Alaska Permanent Fund Corporation: APFC, Brunei Investment Agency: BIA, University of Texas Investment Management Company: UTIMCO, Samruk-Kazyna: SK, Libyan Investment Authority: LIA, Texas Permanent School Fund: PSF, Kazakhstan National Fund: NFRK, State Oil Fund of Azerbaijan: SOFAZ, Ethiopian Investment Holdings: EIH, Khazanah Nasional: Khazanah, New Zealand Superannuation Fund: NZSuperfund, New Mexico State Investment Council: SIC, CNIC Corporation Limited: CNIC, Hong Kong Future Fund: HKGP, Nuclear Waste Disposal Fund: KenFo, Russian Direct Investment Fund: RDIF, Wyoming State Loan and Investment Board: WBC, Fund for Reconstruction and Development of Uzbekistan: UFRD, Azerbaijan Investment Holding: AIH, Timor-Leste Petroleum Fund: TLPF, Mumtalakat Holding: Mumtalakat, Malta Government Investments: MGIS, Oman Investment Authority: OIA, Revenue Regulation Fund: RRF, Ireland Strategic Investment Fund: ISIF, Sociedad Estatal de Participaciones Industriales: SEPI, Sovereign Fund of Egypt: TSFE, NSW Generations Fund: NGF, North Dakota Legacy Fund: NDLF, Solidium: Solidium, Monaco Constitutional Reserve Fund: FRC, Hellenic Corporation of Assets and Participations S.A.: HCAP, Social and Economic Stabilization Fund: ESSF, Chile Pension Reserve Fund: PRF, Heritage and Stabilization Fund: HSF, Indonesia Investment Authority: INA, Pula Fund: PF, Vaekstfonden: VF, Oesterreichische Beteiligungs AG: OBAG, Hong Kong Investment Corporation: HKIC, Colombia Savings and Stabilization Fund: FAE, Japan Investment Corporation: JIC, Alabama Trust Fund: ATF, Regional Investment Company of Wallonia: SRIW, Idaho Endowment Fund Investment Board: EFIB, Fundo Soberano de Angola: FSDEA, Nigeria Sovereign Investment Authority: NSIA, SFPI-FPIM: SFPI-FPIM, Utah SITFO: SITFO, State Capital Investment Corporation: SCIC, Royal Bafokeng Holdings: RBH, Mauritius Investment Corporation: MIC, Sharjah Asset Management: SAM, Oklahoma Tobacco Settlement Endowment Trust: TSET, Louisiana Education Quality Trust Fund: LEQTF, Sentosa Development Corporation: SDC, Fondo de Ahorro de Panama: FAP, Fondo Mexicano del Petroleo: FMP, Colorado Public School Fund Investment Board: PSFIB, Mexico Budgetary Income Stabilization Fund: BISF, Armenian National Interests Fund: ANIF, Western Australian Future Fund: WAFFF, Palestine Investment Fund: PIF, Senegal FONSIS: FONSIS, National Development and Social Fund (Malta): NDSF, Ghana Heritage Fund: GHF, Guyana Natural Resource Fund: NRF, Bahrain Future Generations Reserve Fund: FGF, Kiribati Revenue Equalization Reserve Fund: RERF, Israeli Citizens Fund: ICF, Fujairah Holding: Fujairah, Luxembourg Intergenerational Sovereign Fund: FSIL, Fund for Productive Industrial Revolution: FINPRO, Native Hawaiian Trust Fund: NHTF, Ghana Infrastructure Investment Fund: GIIF, Mongolia Future Heritage Fund: FHF, Agaciro Development Fund: AGDF, Ghana Stabilisation Fund: GSF, Equatorial Guinea Fund for Future Generations: LRRCN and National Fund for Hydrocarbon Reserves: FNRH.

Among the key inputs included in Appendix 1 are the following SWF-relevant data:

- domiciles (jurisdiction of incorporation) as well as principal objectives (if more than have been declared, the overriding one has been selected),

- evidence of dedicated websites (only information on SWF-specific websites has been incorporated) and online two-way communication facilities (for websites enabling such user-oriented interfacing, including chatbots),
- social media presence has been identified through the most intensely used platforms (by monthly active users, MAU) according to the latest publicly available report by Kepios (2022).

The following social media platforms have thus been selected as drivers of social media use by SWFs: Facebook (FB), YouTube (YT), WhatsApp (WA), Instagram (IG), WeChat (WC), TikTok (TT), FB Messenger (FBM), Telegram (TG), DouYin (DY), Kuaishou (KT), Sina Weibo (SW), Snapchat (SC), QQ (QQ), Twitter (TW), Pinterest (PT), Reddit (RD), Quora (QR), and LinkedIn (LI).

Such a choice has evident pros and cons. First of all, it is maximally objective, as no other bias has been applied to the platform selection process. Secondly, to assess an SWF's proactivity in social media, it is paramount to cover the most intensely used platforms on a global basis in view of stakeholder diversity both on the SWF investor and SWF investee sides. Thirdly, MAU is the key performance indicator (KPI) of social networking widely used to determine the performance, growth and popularity of online connectivity (Newberry, 2022), (Trunfio & Rossi, 2021).

Serious weaknesses of this methodology should not be ignored. Firstly, using a global ranking might exclude local platforms which interact effectively with numerous stakeholders within a given SWF and around it. Secondly (and in some part in line with the previous argument), the global choice of social media is heavily skewed toward contents in the English and Chinese languages – a problematic oversimplification in light of numerous languages and dialects used by the populations of some 100 SWFs. Thirdly, MAU related inconsistencies persist, as no absolutely uniform parameters of calculating MAUs have yet been worked out and the very terms “user” and “active” continue to spark considerable controversy.

Still, while the MAU strengths fail to outnumber the weaknesses, they do appear to outweigh them. Particular emphasis has been laid on picking a metric capturing the “stickiness” (i.e. continuity) of social media engagement – an attribute particularly relevant to the ongoing and multilateral stakeholder interconnectedness necessary to foster dialogue between an SWF and its numerous (internal and external) stakeholders.

Any further interpretation of SWFs' use of social media has to be preceded by a few caveats. In reviewing SWFs' social media strategies, additional assumptions have been made (Appendix 1).

To begin with, only SWF-operated social media accounts have been included for, i.e. this research disregards any social media presence developed or maintained by non-SWF entities (including their sponsors, i.e. sovereigns, government agencies or any other external party). After all, if an SWF's social media policy is to be deemed factual, it has to be a proprietary and independent one.

In assessing website-based two-way communication, only interfaces enabling real-time interaction between an SWFs and social media users have been incorporated. The author has purposefully excluded any claims to interaction based on untimely feedback (e.g. via email communications).

Websites and social media platforms used by the SWFs under survey have been independently and repeatedly verified by the author of this paper and, in the event of downtime, their results have been disqualified from the study. The analysis of SWFs' use of social media is therefore a snapshot in time, which is equivalent to many other forms of mainstream corporate reporting.

Linaburg-Maduell Transparency Index (LMTI, 2008, 2023) scores have been available only for a minority of SWFs, which in most cases has more to do with SWF opacity rather than deliberate omission (although the methodology and results rest entirely with SWFI, LMTI's author).

6. Results

Given aforementioned general opacity of most of these funds, it would be unreasonable to anticipate SWFs' fervent uptake of social media. It is noteworthy that the LMTI average for the SWFs covered by this metric (48 funds) amounts to 7.21, however, if all the SWFs (100) were to be included with LMTIs of 0.00 (a realistic assumption), the average would drop to 3.46, a very low standard (on a scale of 1-10).

Some 78 SWFs maintain proprietary websites, albeit none of them cares to engage users in any systematic way of interactive, online dialogue (no such functionalities have been identified for any of the 100 funds under survey). For the SWFs devoid of own websites, information on them has to be gleaned from their sponsors or open-source, paywall databases, think tanks or quote vendors. Moreover, no SWF websites enable real-time,

two-way communication (e.g. through chatbots), some maintain largely unappealing online feedback forms (to which they will respond with varying degrees of promptness, regularity and candor). The prevalent social media platforms used to communicate SWF-related content online are LinkedIn (57 SWFs), Facebook (50 SWFs), Twitter (37 SWFs), YouTube (28 SWFs) and Instagram (23 SWFs) – use of other social media is negligible.

Most SWFs do not demonstrate any serious commitment to ongoing and consistent information transparency (Appendix 1). They do not routinely publish annual reports containing detailed investment policies, let alone semiannual or quarterly breakouts of their portfolios. They are also at liberty to disclose current information (e.g. via newsrooms) as they see fit – i.e. for most of them no explicit or consistent catalogue of actions that would mandate such disclosure exists. In sum, the global population of SWFs does not seem to have a consistent social media strategy.

Such a lever of opacity contradicts the very rationale of SWF creation and maintenance, as such funds are equipped and maintained with public money and place a substantial burden on the current generation (reallocation of current consumption). In other words, the current and future generations are entitled to know the costs and benefits of their SWFs' activities. By the same token, investee stakeholders have every right to know the character of SWF investment activity, including nonfinancial impacts.

Only the largest and most experienced SWFs proactively operate social media accounts, however, they rarely engage social media users in any consistent and frequent form of dialogue. Instead, they occasionally provide live streaming and webcasting, but more frequently podcasting, yet with no pretense to currency, comprehensiveness or regularity of information. That is not to say that no SWFs can use social media effectively to keep all their stakeholders adequately informed, however, online overachievers among SWFs are few and far between.

Both SWFs and their sponsors (sovereigns) should upgrade SWF reporting standards and social media might be a convenient and effective way of reaching out to present and future SWF beneficiaries.

7. Conclusions

Contrary to all expectations, SWFs in general are not forthcoming with comprehensive, timely and reliable information on their activity. Such an observation is particularly surprising given SWFs' provenance: as a matter of fact, they are set up by sovereigns and funded with public money, at the expense of current generations, and should feel obliged to explain how their assets are being put to efficient use. What is more – not only are large-scale and multilateral investments undertaken by SWFs important for local stakeholders but they also affect investees – entitled to comprehend the SWFs' ulterior motives. Most SWFs are way behind the curve on online social media use. Numerous SWFs do not even maintain proprietary websites and none cares to engage users online in real time. SWFs are reluctant to establish an effective, reciprocal and user-friendly presence on social media platforms. Only five major platforms are used predominantly by such funds and the content posted by SWFs often lacks the currency, comprehensiveness and in-depth coverage to enable critical, rigorous and competent scrutiny of their operations (which profoundly affects stakeholders on the investor as well as investee sides). Both SWFs and their sponsors (sovereigns) should upgrade SWF reporting standards and social media might be a convenient and effective way of reaching out to present and future SWF beneficiaries.

References

- Aguilera, R. et al. (2016) "Sovereign Wealth Funds: A Strategic Governance View", *Academy of Management Perspectives*, Vol. 30, No. 1, pp. 5-23.
- Al-Hassan, A. et al. (2013) "Sovereign Wealth Funds: Aspects of Governance Structures and Investment Management", *IMF Working Paper*, WP/13/231, pp. 1-34.
- Bardalai, A. (2021) "The UK as a leading centre for international sovereign wealth funds", [online], TheCityUK, <https://www.thecityuk.com/media/1igjhdz5/the-uk-as-a-leading-centre-for-international-sovereign-wealth-funds.pdf>
- Barlow, J. (1996) "Declaration of the Independence of Cyberspace", [online], <http://homes.eff.org/~barlow/Declaration-Final.html>
- Bengtson, V.L. and Oyama, P.S. (2007) "Intergenerational Solidarity: Strengthening Economic and Social Ties", Expert Group Meeting, Background Paper, Department of Economic and Social Affairs Division for Social Policy and Development, United Nations, New York, USA, pp. 1-20.
- Bharali, R. et al. (2022) "Active Management — The Landscape", *White Paper Multi-Asset Solutions*, State Street Global Advisors, pp. 1-12.
- Brundtland, G.H. (1987) "Our Common Future: Report of the World Commission on Environment and Development", *Transmitted to the General Assembly as an Annex to document A/42/427 - Development and International Cooperation: Environment*, pp. 1-247.

- Carney, M. et al. (2010) "Corporate governance and stakeholder conflict", *Journal of Management & Governance*, Vol. 15, pp. 483-507.
- Cottarelli, C. (2011) "The Challenge of Public Pension Reform in Advanced and Emerging Economies", Fiscal Affairs Department, International Monetary Fund, Washington, DC, USA, pp. 1-71.
- Dixon, A.D., (2014), "Enhancing the Transparency Dialogue in the 'Santiago Principles' for Sovereign Wealth Funds", *Seattle University Law Review*, Vol. 37, Iss. 2, pp. 581-585.
- Funds Europe (2022) 35% of active funds outperformed passive peers in year to June 2022
- International Working Group of Sovereign Wealth Funds (IWG) (2008) "Generally Accepted Principles and Practices – Santiago Principles", London, UK, pp. 1-52.
- Kepios (2022) "The World's Most Used Social Platforms – Ranking of Social Media Platforms by Global Active User Figures (In Millions)", *Digital 2022: October 2022 Global Statshot Report by Simon Kemp*, [online], <https://datareportal.com/reports/digital-2022-october-global-statshot>
- LMTI (2008, 2023), Linaburg-Maduell Transparency Index, methodology and ratings, [online], <https://www.swfinstitute.org/research/linaburg-maduell-transparency-index>
- Newberry, C. (2022), "16 Key Social Media Metrics to Track in 2023 (Benchmarks)", blog, [online], <https://blog.hootsuite.com/social-media-metrics/>
- Nowacki, C. and Monk, A. (2017) "Sovereign Wealth Funds and Private Equity", Stanford Global Projects Center/CDC International Capital, pp. 1-14.
- Schena, P.J. and Schankar, J. (2017) "Financing of the digital ecosystem: The "disruptive" role of sovereign wealth funds... Reconsidered", *Sovereign wealth funds 2015*, The Fletcher School, Tufts University, pp. 1008-119.
- Sharma, R. (2017) "Sovereign Wealth Funds Investment in Sustainable Development Sectors", background paper, [online], https://www.un.org/esa/ffd/high-level-conference-on-ffd-and-2030-agenda/wp-content/uploads/sites/4/2017/11/Background-Paper_Sovereign-Wealth-Funds.pdf
- SWFI (2023), Sovereign Wealth Fund Institute, fund ranking database, [online], <https://www.swfinstitute.org/fund-rankings/sovereign-wealth-fund>
- Truman, E.M. (2007) "A Scoreboard for Sovereign Wealth Funds", Peterson Institute for International Economics (PIIE), Presented at the Conference on China's Exchange Rate Policy, October 19, 2007, at the Peterson Institute, Washington, DC, USA, pp. 1-15.
- Trunfio, M. and Rossi, S. (2021) "Conceptualising and measuring social media engagement: A systematic literature review", *Italian Journal of Marketing*, Springer, vol. 2021(3), pp. 267-292.
- Wiśniewski, P. (2018) *Państwowe fundusze majątkowe jako globalny inwestor alternatywny (Sovereign Wealth Funds as a Global Alternative Investor)*, SGH Publishing House, Warsaw, Poland.
- Wiśniewski, P. (2023) "Mechanizmy interwencji Państwowych Funduszy Majątkowych (PFM) w walce z następstwami Pandemii COVID-19" ("Sovereign Wealth Funds' Interventionism Mechanism vis-à-vis the Aftermath of COVID-19 Pandemic"), SGH Publishing House, Warsaw, Poland, pp. 1-15.

Appendix

Appendix 1: Top 100 SWFs' domiciles (by assets under management in US\$), objectives, general transparency ratings (LMTI), online connectivity via proprietary websites and 18 biggest social media platforms (by monthly active users, MAU, on October 1, 2022) as of January 15, 2023

Rank	SWF	Objective(s)	LMTI (1-10)	Website (w) and 2-way communication (2-way)	Social media presence (SM)
1	CIC	f/x reserve management	7	w	FB, LI
2	NBIM	intergenerational solidarity	10	w	FB, YT, LI
3	ADIA	socioeconomic development	6	w	FB, IG, LI
4	KIA	intergenerational solidarity	6	w	FB, YT, IG, TW, LI
5	GIC	intergenerational solidarity	7	w	FB, YT, IG, WC, LI
6	PIF	socioeconomic development	6	w	FB, YT, IG, TW, LI
7	HKMA	f/x reserve management	8	w	FB, YT, IG, TW, LI
8	Temasek	intergenerational solidarity	10	w	FB, YT, WA, IG, WC, TG, TW, PT, LI
9	QIA	intergenerational solidarity	5	w	FB, TW, LI
10	NCSSF	socioeconomic development	5	w	FB, LI
11	ICD	socioeconomic development	5	w	FB, YT, IG, TW, LI

Rank	SWF	Objective(s)	LMTI (1-10)	Website (w) and 2-way communication (2-way)	Social media presence (SM)
12	TVF	socioeconomic development	6	w	YT, TW, LI
13	Mubadala	socioeconomic development	10	w	FB, YT, IG, TW
14	NWF	retirement security	n/a	n/a	n/a
15	KIC	socioeconomic development	8	w	FB, LI
16	ADQ	direct investment	5	w	IG, TW, LI
17	NDF	intergenerational solidarity	4	w	YT, LI
18	AFF	intergenerational solidarity	10	w	LI
19	AIMCO	intergenerational solidarity	10	w	FB, TW, LI
20	EIA	f/x reserve management	10	w	FB, LI
21	APFC	f/x reserve management	10	w	FB, LI
22	BIA	f/x reserve management	1	w	FB, LI
23	UTIMCO	socioeconomic development	n/a	w	FB, LI
24	SK	socioeconomic development	10	w	FB, YT, WA, IG, TT, TG, TW, LI
25	LIA	intergenerational solidarity	4	w	FB, YT, IG, TW, LI
26	PSF	socioeconomic development	n/a	w	LI
27	NFRK	socioeconomic development	6	n/a	FB
28	SOFAZ	intergenerational solidarity	10	w	FB, YT, IG, TW, LI
29	EIH	intergenerational solidarity	n/a	w	FB, YT, TW, LI
30	Khazanah	socioeconomic development	6	w	FB, YT, IG, TT, TW, LI
31	NZSuperfund	retirement security	10	w	TW, LI
32	SIC	intergenerational solidarity	9	w	FB, YT, TW, LI
33	CNIC	socioeconomic development	n/a	w	FB, TW
34	HKGP	socioeconomic development	n/a	w	FB
35	KenFo	n/a	n/a	w	LI
36	RDIF	direct investment	7	w	FB, IG, TW, LI
37	WBC	intergenerational solidarity	n/a	w	n/a
38	UFRD	socioeconomic development	n/a	n/a	FB
39	AIH	direct investment	n/a	w	FB, TW, LI
40	TLPF	intergenerational solidarity	9	n/a	n/a
41	Mumtalakat	direct investment	10	w	FB, YT, IG, TW, LI
42	MGIS	intergenerational solidarity	n/a	w	LI
43	OIA	f/x reserve management	4	w	YT, IG, WC, TW, LI
44	RRF	macroeconomic stabilization	1	n/a	n/a
45	ISIF	socioeconomic development	8	w	YT
46	SEPI	direct investment	n/a	w	LI
47	TSFE	direct investment	4	w	LI
48	NGF	intergenerational solidarity	n/a	n/a	n/a
49	NDLF	intergenerational solidarity	10	n/a	n/a
50	Solidium	direct investment	n/a	w	LI
51	FRC	socioeconomic development	n/a	n/a	n/a
52	HCAP	direct investment	n/a	w	n/a

Rank	SWF	Objective(s)	LMTI (1-10)	Website (w) and 2-way communication (2-way)	Social media presence (SM)
53	ESSF	macroeconomic stabilization	10	w	n/a
54	PRF	retirement security	10	w	n/a
55	HSF	macroeconomic stabilization	7	w	n/a
56	IIA	intergenerational solidarity	n/a	w	LI
57	PF	intergenerational solidarity	6	n/a	FB
58	VF	direct investment	n/a	w	FB, YT, IG, TW
59	OBAG	direct investment	n/a	w	FB, YT, WA, LI
60	HKIC	socioeconomic development	n/a	w	n/a
61	FAE	macroeconomic stabilization	3	w	FB
62	JIC	direct investment	n/a	w	FB, LI
63	ATF	intergenerational solidarity	9	w	n/a
64	SRIW	direct investment	n/a	w	FB, TW,
65	EFIB	socioeconomic development	n/a	w	FB
66	FSDEA	socioeconomic development	3	w	FB, IG, TW, LI
67	NSIA	socioeconomic development	9	w	FB, YT, TW, LI
68	SFPI-FPIM	direct investment	n/a	w	LI
69	SITFO	socioeconomic development	n/a	w	LI
70	SCIC	direct investment	4	w	FB, LI
71	RBH	direct investment	n/a	w	LI
72	MIC	socioeconomic development	8	w	TW, LI
73	SAM	f/x reserve management	n/a	w	FB, YT, WA, IG, TW, LI
74	TSET	socioeconomic development	n/a	w	FB, YT, TW, KI
75	LEQTF	socioeconomic development	n/a	n/a	n/a
76	SDC	socioeconomic development	n/a	w	FB, WA, LI
77	FAP	macroeconomic stabilization	10	w	TW, LI
78	FMP	macroeconomic stabilization	n/a	w	FB, TW, LI
79	PSFIB	socioeconomic development	n/a	w	n/a
80	BISF	macroeconomic stabilization	n/a	w	TW
81	ANIF	direct investment	n/a	w	FB, YT, IG, TW, LI
82	WAFFF	intergenerational solidarity	10	w	FB, YT, IG, KT, TW, LI
83	PIF	socioeconomic development	n/a	w	YT, IG, TW, LI
84	FONSIS	direct investment	n/a	w	TW, I
85	NDSF	socioeconomic development	n/a	w	n/a
86	GHF	intergenerational solidarity	n/a	n/a	n/a
87	NRF	intergenerational solidarity	n/a	w	n/a
88	FGF	intergenerational solidarity	n/a	n/a	n/a
89	RERF	macroeconomic stabilization	n/a	n/a	n/a
90	ICF	intergenerational solidarity	n/a	n/a	n/a
91	Fujairah	direct investment	n/a	w	FB, LI
92	FSIL	intergenerational solidarity	n/a	n/a	n/a
93	FINPRO	socioeconomic development	n/a	n/a	n/a

Rank	SWF	Objective(s)	LMTI (1-10)	Website (w) and 2-way communication (2-way)	Social media presence (SM)
94	NHTF	socioeconomic development	n/a	n/a	n/a
95	GIIF	socioeconomic development	n/a	n/a	FB, LI
96	FHF	intergenerational solidarity	n/a	n/a	n/a
97	AGDF	socioeconomic development	n/a	w	FB, YT, IG, TW
98	GSF	macroeconomic stabilization	n/a	n/a	n/a
99	LRRCN	intergenerational solidarity	n/a	n/a	n/a
100	FRGF	macroeconomic stabilization	n/a	n/a	n/a

Source: online information disclosure of SWFs and their sponsors, resources available on: Facebook (FB), YouTube (YT), WhatsApp (WA), Instagram (IG), WeChat (WC), TikTok (TT), FB Messenger (FBM), Telegram (TG), DouYin (DY), Kuaishou (KT), Sina Weibo (SW), Snapchat (SC), QQ (QQ), Twitter (TW), Pinterest (PT), Reddit (RD), Quora (QR), and LinkedIn (LI). LMTI (2023).

Origins of Cyberwarfare: How the Internet got Weaponized

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Abstract: Cyberspace was until last decade and half a perfect additional intelligence gathering tool. Within a phase of time during the spread of the world wide web, the cyberspace expanded outside the boundaries of intelligence gathering to a perfect weapon in the hands of both state and non-state actors for destabilizing or devastating the state of critical infrastructures of perceived enemy or competitors. In the heart of the storm, Social Scientists have either focused on extensive definitions and clarifications of cyberwar, others are fixated on explaining the various emerging dangers of cyber weapons on society, like the consequences of weaponizing the cyberspace against a nation's power grid, nuclear command, and control systems, neutralizing a petrochemical plant, paralyzing a government's health care or governance structure and possibilities of manipulating elections. But few, if any have considered the question which is central to this paper: How did the cyberspace evolve from an intelligence tool to a cyberweapon against critical infrastructures? The obvious answer is that the magnified global access and use of networked systems provided the perfect battle space for deploying cyberweapons. The preceding explanation is essentially correct, but it is entirely lacking in detail explaining how cyberspace became weaponized? Under what conditions was cyberspace purely an intelligence tool. Under what conditions is cyberspace weaponized? This research incorporates these and other questions into a framework through the means of a model designed to aid understanding of how the cyberspace evolve from an intelligence tool to a destructive weapon targeted at critical infrastructures. Primary sources include relatively untapped 107 Congress Laws on Cyber related legislations. From the 105th congress to the current 116th congress, 1, 177 legislations have been introduced on cyber or cyber related issues. Other primary sources include White House fact sheets, statements, press releases, President Trump's 2018 National Cyber Security Strategies, President Obama's 2016 Cyber Security National Action Plan, and cyber related executive orders, statements, and press releases from President Johnson of the last 5 US administrations.

Keywords: Cyberwar, cyberweapons, cyberspace, cyberwarfare, U.S legislations, National Cyber Security Strategies

1. Introduction

Cyberspace was until the 21st century, an additional intelligence-gathering and communication tool. As an intelligence tool, state actors collected secret or open information via covert or overt digital activities. The secret information ranged from U.S. data about the intentions and capabilities of other nations to U.S. understanding of the level of data other nations have about U.S. surreptitious capabilities and intentions. The covert activities seemed like inter-national hide and seek games, guided by self and globally initiated rules. The massive leak of NSA documents in 2005 detailing U.S. surveillance programs, accessing internet company data, eavesdropping, and tapping fiber optic cable explains how nations collected information through covert digital activities (Popovich and Chen 2013).

While it is arguable that intelligence gathering through cyber means was a weapon that provided undue advantage over allies and adversaries, at the time however intelligence gathering through cyber means lacked the sole capability of wreaking havoc without successive actions and decisions. Intelligence gathering through cyber means was by itself harmless unless used as the basis for decisions and actions that may be destructive.

However, beginning February 1990, when the era of military involvement in the operation of the internet ended, and ARPANET decommissioned, the network grew faster, access and use of the world wide web spread like an unending spider web, and the cyberspace expanded outside the boundaries of intelligence gathering to a perfect weapon in the hands of both state and non-state actors who destabilize or devastate critical infrastructures of perceived enemy or competitors. These state and non-state actors used the cyber weapon to incapacitate an adversary's national critical infrastructure, frustrate it, slow it, undermine its institutions, and leave its citizens angry or confused (Sanger 2018). Examples include the 2022 disruption of US gas pipelines, Russia's alleged use of fake social media campaigns to interfere in U.S. 2016 presidential election; the late November 2014 North Korean attack on Sony Pictures in connection to the planned release of the poorly reviewed movie *the interview*; the 2010 American *Stuxnet* attack on Iran and North Korea's weapons program, the Chinese decades-long espionage of U.S. trade secrets, and 2007 Russian attack on many of Estonian government departments, political parties, media organizations, and companies.

At the heart of the cyber weaponization storm, social scientists have focused on extensive definitions and clarifications of cyber warfare, what it means, what it entails, and whether threats can deter, or defense can

mitigate its effects. These studies often attempt to explain the various emerging dangers of cyber weapons on society, like the consequences of weaponizing the cyberspace against a nation's power grid, nuclear command, and control systems, neutralizing a petrochemical plant, paralyzing a government's health care or governance structure and possibilities of manipulating elections (Healey 2013).

But few, if any, have considered the question central to the current research: How did the cyberspace evolve from an intelligence tool to a cyber weapon against critical infrastructures? The obvious answer is that the magnified global access and use of networked systems provided the perfect battle space for deploying cyberweapons. As Abbate puts it, the worldwide system called the Internet played a significant role in developing and popularizing network technology, which placed computers at the center of a new communications medium (Abbate. 1999). Between the late 1960s and the 1990s, the Internet grew from a single experimental network serving a dozen sites in the United States to a globe-spanning system linking millions of computers. It brought innovative data communications techniques into the mainstream of networking (Abbate 1999). The preceding explanation is essentially correct, but entirely lacks details explaining how cyberspace became weaponized. Under what conditions is cyberspace purely an intelligence tool? Under what conditions is cyberspace weaponized? When does the change happen?

What aspects of cyberspace do government budget and money target? What aspects of cyberspace do trainings target? What government agencies are responsible for what or to do what? By what growing government legislative efforts do cyber dependent societies sustain resilience of Critical Infrastructure? When and why do cyber policies in the U.S. change to respond to the emergence of cyberspace as a weapon? Under what conditions do these policy changes occur? What modifications do the U.S. Department of Defense (DoD) policies and Cybersecurity Executive Orders seek to protect critical infrastructure from cyber weapons?

Hence the objective of the research is to outline a model that will aid the understanding of how the cyberspace evolves from an intelligence tool to a destructive weapon targeted at critical infrastructures. Critical infrastructures as operationalized within the Executive Order on *Improving Critical Infrastructure Cybersecurity*, include systems and assets, whether physical or virtual, so vital to the United States that the incapacity or destruction of such systems and assets would have a debilitating impact on security, national economic security, national public health or safety, or any combination of those matters.

The model serves as preliminary and a heuristic device useful in facilitating a conversation on relatively important but ignored details of cyberspace. More broadly, the outcome of the research adds to the literature useful for subsequent studies targeting theory building about state shifts in the use of cyberspace. Dissecting how the cyberspace evolved to a weapon may also provide useful insight into leverage points that are useful for cyber policymaking process, where small change could lead to a large shift in behaviour

2. Research Methods

The work adopts the case study approach. During the exploratory phase, we discovered that the first mention of the closest cyber-related word 'internet' in U.S. legislation was in the S.1001. bill 1987, focusing on promoting and providing increased access. The next two mentions of the Internet occurred three years after in the House and Senate of the 102nd Congress (1991 – 1992). Thus, while the model will attempt to capture and classify cyber intelligence activities prior to 1994, the primary sources for the research will include relatively untapped 107 Congress Laws on Cyber related legislations and cyber-related executive orders from 1992 to 2022 when a Russian-speaking group of hackers knocked multiple US airport websites offline (Wallace et.al 2022).

Congress Laws on Cyber related legislations and cyber-related executive orders within these three decades will show exactly when and how the aims of the legislations shifted from promoting the internet and improving access to protecting against cyberattacks.

The researcher extracted the laws from Congress.gov, the official website for U.S. federal legislative information. The site provides access to accurate, timely, and complete legislative information for Members of Congress, statutory agencies, and the public. It is presented by the Library of Congress (L.O.C.) using data from the Office of the Clerk of the U.S. House of Representatives, the Office of the Secretary of the Senate, the Government Publishing Office, Congressional Budget Office, and the L.O.C.'s Congressional Research Service (Congress.gov 2012). The Congress.gov search with the keyword "Cyber" returned 1225 legislation, 746 originated from the House and 479 from the Senate, of the 1225, only 107 were converted to laws. See figure 1 for the timeline of U.S. cyber-related bills passed into law.

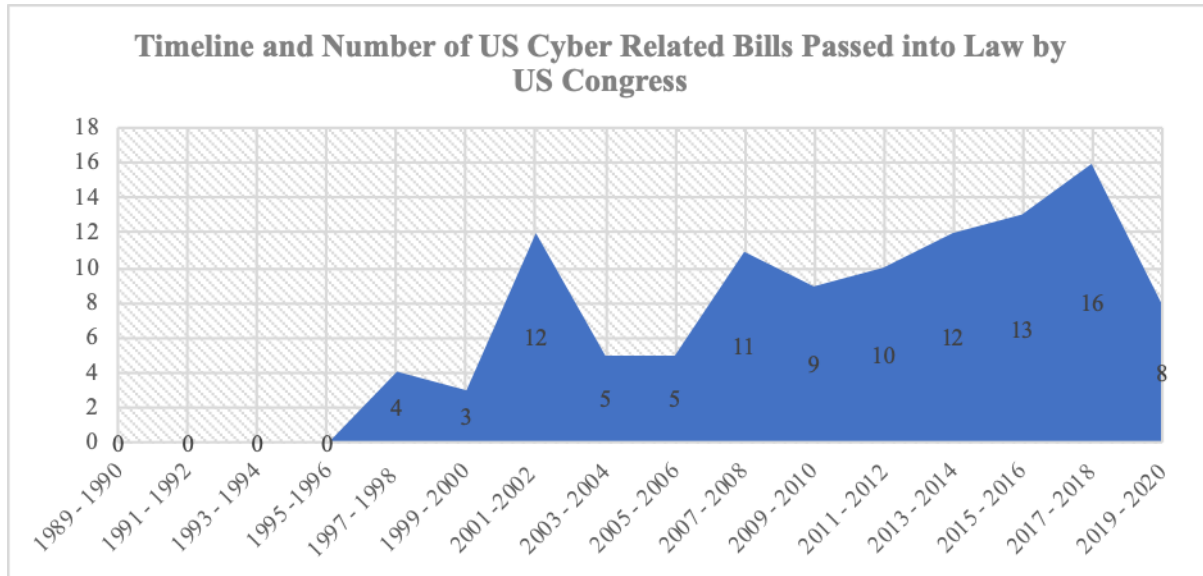


Figure 1 consists of U.S. cyber-related bills passed into law by U.S. congress between 1997 (105th Congress) and 2020 (116th Congress). I classified the laws according to the rate of bills passed into law by respective congresses. For instance, the year 1997 – 1998 in figure 2 indicates that the 105th Congress passed four cyber-related bills into law, while the 115th Congress between 2017 -2018 passed 16 cyber-related bills into laws. It is essential to highlight that the numbers in figure 2 represent cyber-related bills that became laws. I did not include cyber-related bills introduced to Congress, considered by committees, floors, or passed by one or both chambers in the study.

Figure 1: Timeline and Number of U.S. Cyber Related Bills Passed into Law by U.S. Congress

The study opted for legislation passed into law since these are rules that the United States accepts and recognizes as regulating stakeholders' actions, especially citizens and inhabitants. Using laws does not mean that the content of the U.S. Congress laws used for the study captures all the actions that transpired in all three phases among citizens, nor does it mean that these mandated laws are the only factors responsible for the cyber weaponization as it is today. Instead, the study opted for U.S. congress laws since it can reveal nationally binding and mandated actions about the existing cyber developments in the United States.

The other group of primary sources include 14 executive orders from the Clinton to the Trump administration. The reason is that executive orders often have much the same power as a law. Executive orders, a type of executive action, play a significant role in the U.S. President's ability to enforce the laws of the United States.

3. Research Limitations

The model is strictly based on the US data. The model does not represent the processes or interpretations of US cyber strength and vulnerabilities by external allies, partners, or enemies. It is only a representation of the picture of the processes and interpretations of cyber strength, vulnerabilities and weaponization in the United States. Moreover, the findings of the study may not represent the cyber weaponization processes in other developed and cyber reliant economies.

4. Preliminary Model

From the preliminary inductive approach to content analysis of the primary data, the goals, targets, and aims of the bills appeared in patterns, which I generalized into a model that describes how cyberspace evolves from an intelligence tool to a cyber weapon targeted at protecting and destabilizing critical infrastructures. Three overlapping phases of intra-country processes constitute the proposed model. See figure 2

Each phase has core tenets that defines and makes the proposition of the model testable and falsifiable. For instance, the core tenets and indicators of the cyber independent phase are legislations and theme dominantly promoting improved access, spread, diffusion of innovation, intelligence collection dominates. The legislation and funding barely target protection and security of cyberspace from adversaries. More so less than a third of the critical infrastructure sectors are dependent on cyber to function. Appropriations are implicit about the available funding specific to cyber.

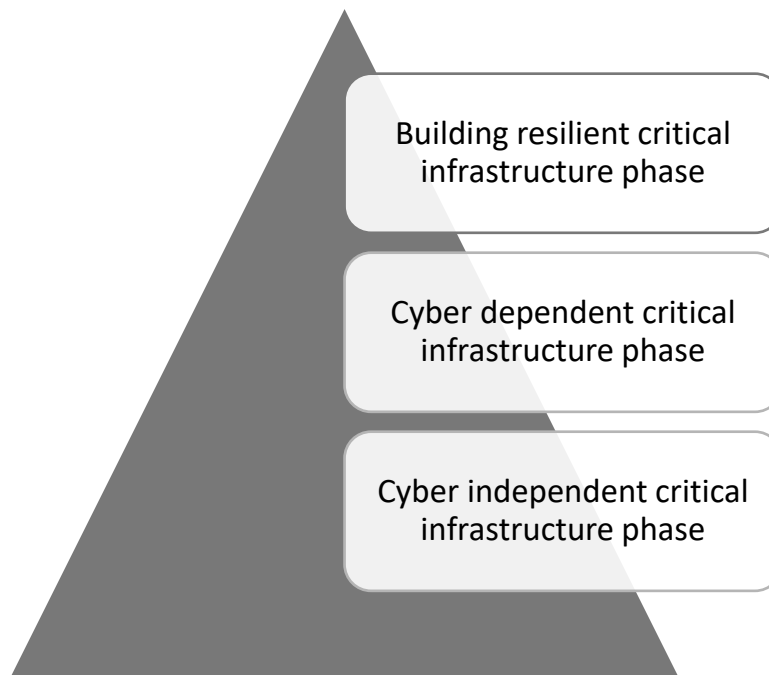


Figure 2: Preliminary model of how cyberspace evolves into piercing weapons

The next phase is dominated by legislation that prioritize protection over access, spread, diffusion of innovation, both in terms of budgetary allocations and legislation passed, including legislation to prepare human and mechanical capacities against potential attacks

More than a third of the critical infrastructure sectors are dependent on cyber to function and there is a growing awareness and sensitization of different stakeholders about the remarkable impact of an attack targeted at cyber dependent critical infrastructures. Appropriations are barely explicit about the available funding specific to cyber.

The last phase legislation prioritizes and drives institutionalization of security, norms, ethics in cyberspace because at this point nearly all 16 critical infrastructure sectors depend on cyber to function. More than half of the 16 critical infrastructure sectors experienced noteworthy annual cyber-attacks. In the phase, the risk and vulnerability of cyber-attacks increases. The demand to close any legislative gaps that may expose U.S. infrastructures to grave disruptions and losses also increases. Appropriations are explicit about the available funding specific to cyber. Cyber still serves as a communication and an intelligence-gathering tool for government but human capabilities are prepared for retaliatory and offensive attacks; numerable critical infrastructure sector-specific agencies exist at both federal and state levels; Risk and vulnerability to cyber-attacks spreads into every sector.

A remarkable insight is that the legislative priorities and themes of a former phase drips into the latter phase but not vice versa. For instance, the legislative priorities and themes of the cyber independent phase trickles into the cyber dependent phase and the legislative drives of both phases' trickles into the building resilient critical infrastructure phases but not the reverse. It means that there can be few legislative themes focusing on improved access in the building resilient phase but there can't be themes for institutionalization of security, norms, ethics in cyberspace in the cyber independent critical infrastructure phase. The flowing paragraphs provide more explanation and preliminary evidence about each phase.

The cyber independent critical infrastructure phase: This is the pre-weaponization stage. During this phase, cyber served as a communication and an intelligence gathering tool for government. The first photo reconnaissance satellite that will aid military observation of a region to locate an enemy or to ascertain its strategic features was launched in 1962 (Federation of American Scientist 1996). Though these technical collection efforts had been ongoing for several years in both C.I.A. and the Air Force, they were formally consolidated, pursuant to a national security directive, in 1961 within the National Reconnaissance Office (NRO).

During the cyber independent critical infrastructure phase, cyber related laws were also mostly federal laws not State laws targeted at building cyber dependent infrastructures. The focus of U.S. legislations was on computer

fraud and deterring unauthorized access to computers. The dominant legislation at the time was the United States Computer Fraud and Abuse Act which was enacted in 1986 as an amendment to existing computer fraud law (18 U.S.C. § 1030) (Doyle 2014). According to the law, access to a computer without authorization or exceeded authorized access, and by means of such conduct obtains information that has been determined by the United States Government pursuant to an Executive order or statute to require protection against unauthorized disclosure for reasons of national defense or foreign relations, or any restricted data, as defined in paragraph y of section 11 of the Atomic Energy Act of 1954, with the intent or reason to believe that such information so obtained is to be used to the injury of the United States, or to the advantage of any foreign nation (Computer Fraud Act 2006). The reason why the U.S. legislations focused more on deterring unauthorized access to information and communication technology and fraud and related activity in connection with computers is that before the Internet became a globe-spanning system linking millions of computers from the late 1990s, the network technology was only deployed as experimental networks serving a dozen sites in the United.

The cyber independent critical infrastructure was also marked by efforts of the U.S. legislative to provide network access to the Internet to an increasing number of sectors. At the early stage of the phase, the legislative attention to the need for network access for more sectors appeared weak. Any bill proposing more access was more likely to wind-up at the introductory stage of the legislative process. For instance, the first mention of the closest cyber-related word 'internet' in U.S. legislation was in the S.1001. bill 1987

The S.1001. was a bill to amend title IV of the Social Security Act to improve the performance of States in establishing the paternity of children, assuring the adequacy of child support award amounts, and enforcing child support awards. The bill which was sponsored Senator Bill Bradley in the 100th Congress (1987 -1988) was read twice and referred to the Committee on Finance, where it died. The mention of the Internet in the bill reads

"Directs the Secretary to enter into an agreement with the Secretary of Labor to provide the Parent Locator Service with prompt access to the INTERNET system which tracks interstate unemployment insurance claims of the State employment security agencies and the Labor Department."(S.1001 1998)

The next two mentions of the Internet occurred three years after in the House and Senate of the 102nd Congress (1991 – 1992) and again these bills did not exceed the introduction status of legislation, meaning that when the bill was referred to the Senate Committee on Commerce and the House Subcommittee on Science respectively, these committees did not act on the bills, an equivalent of killing it. The initial was in the HR 5759: *Information Infrastructure and Technology Act of 1992*, sponsored by Rep. George Brown, and the next was in S. 2937: *Information Infrastructure and Technology Act of 1992*, sponsored by Sen. Albert Gore.

Though these Information Infrastructure and Technology bills did not make it past the committees and subcommittees, Senator Gore and Rep. Brown's legislative attempts indicate that the cyberspace, a budding information infrastructure that required more funding to deploy more technologies into other critical infrastructures in various sectors, was in 1991 merely in its pre-smart phase in the U.S.

Towards the end of the cyber independent critical infrastructure phase, the first-ever cyberattack, the Morris worm, occurred by mistake. Robert Tappan Morris, in 1988 developed a program to assess the size of the Internet. The program would crawl the web, install itself on other computers, and then count how many copies it made. Once tallied, the results were supposed to indicate the number of computers connected to the Internet (Climer 2018). Instead of following the desired command in computers where it was installed, the worm infected and incapacitated computers until they finally crashed.

Structuring cyber reliant critical infrastructure phase: Also known as the weaponization phase. Here, more than one third of 16 critical infrastructure sectors are dependent on cyber to function; In October 1997, the President Bill Clinton's Commission on Critical Infrastructure Protection issued its report calling for a national effort to assure the security of the United States' increasingly vulnerable and interconnected infrastructures. According to the report, the president's intent was that the United States will take all necessary measures to eliminate any significant vulnerability to both physical swiftly and cyber-attacks on our critical infrastructures, including especially our cyber systems. The cyber dependent critical infrastructures were telecommunications, banking and finance, energy, transportation, and essential government services (The White House 1998).

The United States desperately reckoned with existing human and infrastructure gaps in the prevention and response capabilities of state and local law enforcement agencies to cyberattacks. Federal law inspired government agencies to start training and acquiring equipment that will assist in the prevention and quick response to cyber-attacks. Congress began to introduce and pass legislation to prepare human and mechanical capacities against potential attacks. The appropriation acts captured expenditures for the protection of

cyberinfrastructures; the U.S. government embraced the necessity to set money aside for the protection of cyberinfrastructure.

It was until this phase that the political will to cover and refund “any cost” incurred by all federal government agencies if the cost was associated with preparing and improving the competencies of human and mechanical competencies to respond and or prevent cyber-attacks. Appropriation Acts or bills explicitly captured preventing cyberspace dangers as worthy of national goal and attention. On May 22, same year, 1998, the Clinton administration issued the Presidential Decision Directive 63 (The White House 1998).

The PDD-63 outlined the increased reliance on cyberinfrastructure by public and private enterprises, and the strong need for collaboration to improve the security of this infrastructure. The directive marked the first White House effort to address vulnerabilities from the United States dependence on cyberspace and established a framework to encourage information sharing and collaboration among various sectors (Spaulding 2013)

By the 105th Congress (1997 – 1998), the term 'cyber' was first used in U.S. bills. From a congress that passed no bill citing cyber to a congress that introduced six legislations, that passed both chambers, and four became laws. The four laws targeted were appropriations for the Department of Defense in the fiscal year ending September 30, 1999. Other purposes include reimbursing departments and agencies of the Federal Government for any costs incurred in connection with “providing training and related equipment for the chemical, biological, nuclear, and cyber-attack prevention and response capabilities to State and local law enforcement agencies” (Rogers 1997).

Beginning November 1998, the federal U.S. annual legislation passed into law on cyberinfrastructure protection never decreased below three (See figure 2). The 111th Congress between 2009 and 2010, considered 93 legislations, the highest of the immediate past five congresses before 2009. Ten of these passed both chambers and nine became laws.

The weaponization phase is also marked by growing awareness and sensitization of different stakeholders about the remarkable impact of an attack targeted at cyber dependent critical infrastructures. But evidence of cyber-attacks on these infrastructures were still absent during this phase indicating that the in-country cyberspace is still a budding attractive war space for known and unknown state enemies. The risks, threats and vulnerability to cyber-attacks were not as palpable as it appeared in the weaponized phase. In a 2001 congressionally required annual report on the Status of Federal Critical Infrastructure Protection Activities, the National coordinator of Infrastructure Assurance Council, Richard Clarke, who warned of a possible "electronic Pearl Harbor, highlighted to the President, heads of departments and agencies in pursuant of the implementation of PDD-63, the potential threats and vulnerabilities of cyber dependent infrastructures. Actual cases of cyberattacks were absent from the report.

To foster a climate of enhanced public sensitivity to the problem of infrastructure protection, the Former U.S. President, Bill Clinton, in PDD-63 emphasized that

“The White House, under the oversight of the National Coordinator, together with the relevant Cabinet agencies shall consider a series of conferences: (1) that will bring together national leaders in the public and private sectors to propose programs to increase the commitment to information security; (2) that convoke academic leaders from engineering, computer science, business and law schools to review the status of education in information security and will identify changes in the curricula and resources necessary to meet the national demand for professionals in this field; (3) on the issues around computer ethics as these relate to the K through 12 and general university populations.” (The White House 1998).

The signs and possibilities of cyberspace becoming the fifth dimension of warfare that could complement the four U.S. standard dimensions: land, sea, air, and space were apparent.

Before the end of former President Clinton tenure, he writes in one executive order that, “Certain national infrastructures are so vital that their incapacity or destruction would have a debilitating impact on the defense or economic security of the United States. These critical infrastructures include telecommunications, electrical power systems, gas and oil storage and transportation, banking and finance, transportation, water supply systems, emergency services (including medical, police, fire, and rescue), and government continuity. Threats to these critical infrastructures fall into two categories: physical threats to tangible property ("physical threats"), and threats of electronic, radiofrequency, or computer-based attacks on the information or communications components that control critical infrastructures ("cyber threats") (Clinton, 1996)

Building resilient critical infrastructure phase: Classified as the third phase, nearly all 16 critical infrastructure sectors depend on cyber to function. More than half of the 16 critical infrastructure sectors experienced noteworthy annual cyber-attacks. Numerous domestic instances, cases or opportunities that stimulate a sense of urgency for proposed cyber-related bills abound. In a survey of 24 federal agencies, G.A.O., the United States Government Accountability Office, reported that between 2006 and 2015, the number of cyberattacks climbed 1,300 percent — from 5,500 to over 77,000 a year (GAO 2016). Statista, a statistics portal with directly accessible data for 170 industries and 50 countries, also reported that data breaches and records exposed in the United States between 2005 and the first half of 2018 number in the millions (Statista 2018). These data breaches in the United States amounted to 668, with over 22 million records exposed.

Between the 112th and 116th congresses in 2020, 876 more legislations were introduced by different lawmakers. These increases suggest U.S. shifts from a nation-building preliminary infrastructure and seeking to provide access to a nation embracing the growing and exponential sense of urgency for the protection of U.S. cyberspace and cyber dependent critical infrastructures from attacks that threaten national security.

In the phase, the risk and vulnerability of cyber-attacks increases, so the demand to close any legislative gaps that may expose U.S. infrastructures to grave disruptions and losses. Congress or tiers of government laws targeted improving the resilience of cyber dependent infrastructures, increasing human capacities and competencies, and connecting more critical infrastructure to cyber-enabled networks; Congress or all tiers of government laws targeted protection of existing cyberinfrastructure; For instance, as soon as the American Recovery and Reinvestment Act of 2009 provided the U.S. Department of Energy with \$4.5 billion to modernize the electric power grid (SmartGridGov 2020), research funds for capacity building were captured in the appropriation Acts. One of the sample appropriations Acts, the [H.R. 3183] Energy and Water Development and Related Agencies Appropriations Act, 2010, highlights these points

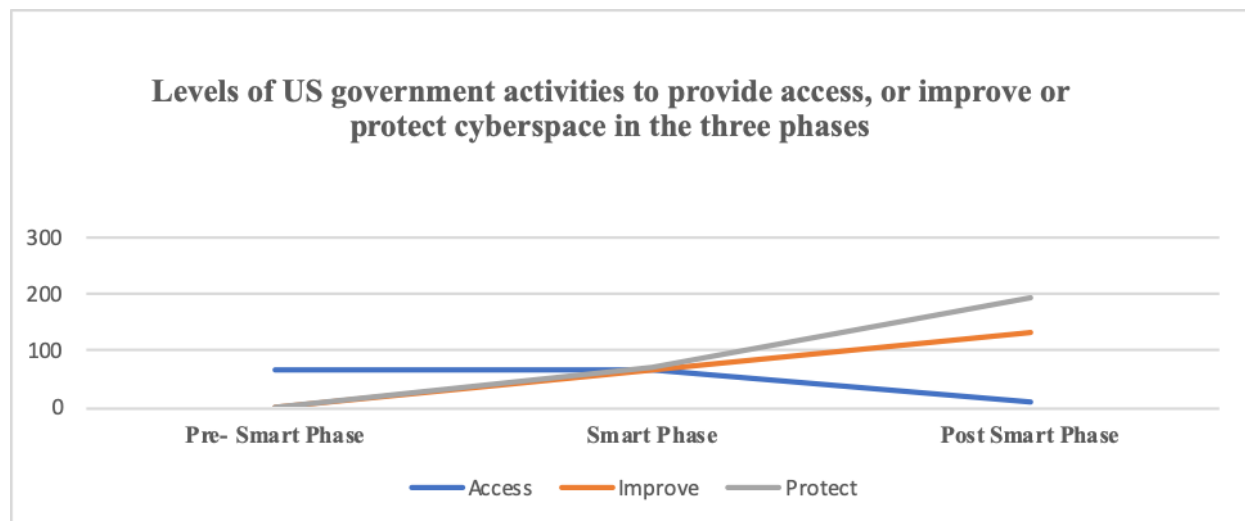


Figure two illustrates the government's attention to access, the need to improve and protect critical infrastructures during each phase.

During the third phase, the U.S. cyberspace became an attractive war space for known and unknown state enemies; even though cyber still serves as a communication and an intelligence gathering tool for the U.S. government, the U.S. is making budgetary allowance to increase the of rate human capabilities prepared for retaliatory or offensive attacks; There are numerous critical infrastructure sector specific agencies at both federal and state and community levels. Appropriation is explicit about the available funding specific to cyber. (See figure 3).

Each Secretary of a military department shall

'The defense agency and funds focus on deploying human capacity to reduce the risk of cybersecurity threats posed by quantum information science technology. Cyberspace is acknowledged as war space

Section. 220. on the modification of defense quantum information science and technology research and development program authorizes the department of defense to select for the Detachment, and make efforts to retain, members of the reserve components who possess relevant private-sector experience in the fields of business, acquisition, intelligence, engineering, technology transfer, science, mathematics, program

management, logistics, cybersecurity, or such other fields as determined by the Under Secretary of Defense for Research and Engineering (National Authorization Act, 2020)

Besides Section 361 subsection 1 acknowledges the cyberspace as a war space description of each readiness problem or deficiency that affects the ground, sea, air, space, cyber, or special operations forces, and any other area determined appropriate by the Secretary of Defense (National Authorization Act, 2020).

In the third phase, citizens are most conscious, prepared or trained about of the risks of the smart county; most relevant national tertiary institutions have technical competencies and evidence of improved cyber technologies; all 16 critical infrastructure sectors depend on cyber; any cyber-attack on critical infrastructure that will inflict remarkable effects on the affected critical infrastructure sector; Congress or tiers of government laws are targeted at improving the protection of cyber dependent infrastructures, increasing human capacities and competencies for the protection of cyberinfrastructures, and increasing the resilience of cyber dependent critical infrastructure; Congress or all tiers of government laws are targeted at protection of existing cyberinfrastructure; in-country cyberspace is a full-blown attractive war space for known and unknown state enemies; cyber still serves as a communication and an intelligence-gathering tool for government but human capabilities are prepared for retaliatory and offensive attacks; numerable critical infrastructure sector-specific agencies exists at both federal and state levels; Risk and vulnerability to cyber-attacks spreads into every sector.

Most critical infrastructures are interconnected, and maximum efficiency cyber and according to the Cybersecurity and Infrastructure Security Agency (CISA 2020), 16 cyber dependent critical infrastructure sectors exist today. These sectors include Chemical sector, Commercial Facilities, Communications sector, Critical Manufacturing sector, Dams, Defense Industrial Base, Emergency Services, Energy, Financial Services, Food and Agriculture, Government Facilities, Healthcare and Public Sector, Information Technology, Nuclear Reactors, Material and Waste, Transportation Systems, Water and Wastewater Sectors.

5. Preliminary Conclusions

The preliminary analysis indicates that the cyber shifts from an intelligence tool to a weapon strode through the following phases in government legislations: the cyber independent critical infrastructure phase, structuring cyber reliant critical infrastructure phase, and building resilient critical infrastructure phase. The model is preliminary and a heuristic device useful in facilitating a conversation on relatively important but ignored details of cyberspace. More broadly, the preliminary study provides good descriptions that will be useful for theory building in my thesis about state shifts in the use of cyberspace.

References

- Abbate, Janet. 1999. *Inventing the Internet*. Cambridge: M.I.T. Press.
- Barrett, Brian. "D.O.J. Charges North Korea Hacker for Sony, WannaCry, and More (Links to an external site)." *Wired*, September 6 2018.
- Bennett, Andrew and Jeffry T. Checkel. *Process Tracing: From Metaphor to Analytic Tool*. (2015) Cambridge: Cambridge University Press. ISBN: 978-1-107-68637-3
- Charles Doyle (2014) *Cybercrime: A Sketch of 18 U.S.C. 1030 and Related Federal Criminal Laws*. Congressional Research Service <https://fas.org/spp/crs/misc/RS20830.pdf>;
- Clapper, James. "Cyber Deterrence Policy." C-SPAN.org. May 11, 2017. Accessed December 2, 2018. <https://www.c-span.org/video/?428339-1/intel-chiefs-testify-us-cyber-defense-strategy>.
- Computer Fraud and Abuse Act (18 USC 1030) <https://www.energy.gov/sites/prod/files/cioprod/documents/ComputerFraud-AbuseAct.pdf>
- Computer Fraud and Abuse Act (18 USC 1030) <https://www.energy.gov/sites/prod/files/cioprod/documents/ComputerFraud-AbuseAct.pdf>
- Cybersecurity and Infrastructure Security Agency (CISA). 2020. *CRITICAL INFRASTRUCTURE SECTORS*. March 24. Accessed April 24, 2020. <https://www.cisa.gov/critical-infrastructure-sectors>.
- Dey I. (1993) *Qualitative Data Analysis. A User-Friendly Guide for Social Scientists*. Routledge, London.
- Federation of American Scientist (February 1996). *The Evolution of the U.S. Intelligence Community-An Historical Overview* <https://fas.org/irp/offdocs/int022.html>
- George, & Bennett, A. (2005). *Case studies and theory development in the social sciences*. MIT Press.
- Greg Wallace, Sean Lyngaas, Pete Muntean and Michelle Watson, CNN (Oct 10, 2022) <https://www.cnn.com/2022/10/10/us/airport-websites-russia-hackers/index.html>
- Jamieson, Kathleen. *Cyberwar - How Russian Hackers and Trolls Helped Elect a President: What We Don't, Can't, and Do Know*. New York: Oxford University Press, 2018. <https://global.oup.com/academic/product/cyberwar-9780190915810?cc=us&lang=en&#>
- King, Gary, Keohane, Robert O. and Verba, Sidney. *Designing Social Inquiry: Scientific Inference in Qualitative Research*, Princeton University Press, 1994.

- Krebs, Brian. "F.B.I.: North Korea to Blame for Sony Hack. ([Links to an external site.](#)) ([Links to an external site.](#))" December 14 2014.
- Libicki, Martin. *Cyber deterrence and cyberwar*. Santa Monica, CA: RAND Corporation, 2009. <https://www.rand.org/pubs/monographs/MG877.html>.
- National Authorization Act, 2020, S. 1790, 116th Cong. (2019) Supporting Veterans in STEM Careers Act, Pub. L. 116–115, 134 STAT. 107 (2020)
- National Authorization Act, 2020, S. 1790, 116th Cong. (2019) Supporting Veterans in STEM Careers Act, Pub. L. 116–115, 134 STAT. 107 (2020)
- Peter, Ada S. 2017. "Cyber Resilience Preparedness of Africa's Top-12 Emerging Economies." *International Journal of Critical Infrastructure Protection* 17 (June): 49–59. <https://doi.org/10.1016/j.ijcip.2017.03.002>.
- Research, SmartGridgov - *Advanced Grid - Initiatives that catalyze the industry to modernize the grid*. Accessed April 24, 2020. <https://www.smartgrid.gov/>.
- Research, SmartGridgov - *Advanced Grid - Initiatives that catalyze the industry to modernize the grid* (2020)
- S.1001 - A bill to amend title IV of the Social Security Act to improve the performance of States in establishing the paternity of children, assuring the adequacy of child support award amounts, and enforcing child support awards. 100th Congress (1987-1988)
- Sanger, David. 2018. *The Perfect Weapon*. Penguin Random House.
- Schmitt, Michael. "Peacetime Cyber Responses and Wartime Cyber Operations Under International Law: An Analytical Vade Mecum." *Harvard National Security Journal* 8 (February 17): 281-82.
- Schneier, Bruce. "Lessons from the Sony Hack ([Links to an external site.](#)) ([Links to an external site.](#))" *Wall Street Journal*, December 19 2014.
- Siobhan, Climer (2018). History Of Cyber Attacks From The Morris Worm To Exactis <https://gomindsight.com/insights/blog/history-of-cyber-attacks-2018/>
- Suzanne Spaulding (2013) The Atlantic Council. *15th Anniversary of PDD-63: History of Cyber Critical Infrastructure Protection*. <https://www.atlanticcouncil.org/commentary/event-recap/15th-anniversary-of-pdd63-history-of-cyber-critical-infrastructure-protection/>
- Tetlock, Philip E. and Aaron Belkin (1996). *Counterfactual Thought Experiments in World Politics*. Princeton: Princeton University Press. ISBN: 0-691-02791-9.
- The Statistics Portal, "Statista, , accessed December 17, 2018, <https://www.statista.com/aboutus/>.
- The White House (1998). The Congressional Research Service. *Presidential Decision Directive/Nsc-63* <https://fas.org/irp/offdocs/pdd-63.htm>
- The White House (1998). The Congressional Research Service. *Presidential Decision Directive/Nsc-63* <https://fas.org/irp/offdocs/pdd/pdd-63.htm>
- The White House (1998). The Congressional Research Service. *Presidential Decision Directive/Nsc-63* <https://fas.org/irp/offdocs/pdd-63.htm>
- United States Government Accountability Office, Information Security, *FDIC Needs to Improve Controls over Financial Systems and Information: Report to the Chairman, Federal Deposit Insurance Corporation* (United States, 2016).
- United States Government Accountability Office. *Information Security, FDIC Needs to Improve Controls over Financial Systems and Information: Report to the Chairman, Federal Deposit Insurance Corporation*. United States, 2016.
- United States Government. White House Office of Trade and Manufacturing Policy. White House. *How China's Economic Aggression Threatens the Technologies and Intellectual Property of the United States and the World*. Washington: United States Government, 2018. 2-3.
- White House, "Fact Sheet: Actions in Response to Russian Malicious Cyber Activity and Harassment." *Obama Press Release*, December 29, 2016, <https://perma.cc/C83Z-SQSL>
- William J. Clinton, (1996). Executive Order 13010—Critical Infrastructure Protection. <https://www.presidency.ucsb.edu/documents/executive-order-13010-critical-infrastructure-protection>

Short-term Impact of Instagram on Livelihoods of Artisans at Accra Arts Centre

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Abstract: The Accra Arts Centre in Ghana is a physical commercial hub for over eight hundred artisans. However, due to an ongoing construction project, the Marine Drive Project, the artisans' livelihoods are threatened. The Marine Drive Project aims to transform parts of the Accra coastline into a residential business district; hence will demolish the current Accra Arts Centre. Therefore, there is a need to explore sustainable livelihoods – ones that withstand stresses and shocks, such as the Marine Drive Project. Within the sustainable livelihoods framework, socially sustainable livelihoods encompass the economic gain that persons can derive from meeting their needs and affording them a decent living – such as the economic gain the artisans get from selling. To promote this social livelihood and withstand the stress of the project, artisans can use Instagram for commerce due to its visual emphasis, social features and embedded e-commerce platform. The Digital Business Transformation Initiative has taught about 120 artisans how to use Instagram for trade, and this research investigates its impact on the artisans' livelihood. Through the literature reviewed, brand awareness is a step towards increasing the sales volume on social commerce. Therefore, the impact on brand awareness was studied to investigate the short-term effect of Instagram on the artisans' business. The independent variable is the number of followers the artisan has, and the dependent variables are the frequency of posts by the artisan and the number of persons they follow. The findings gained external validity through a comparative analysis against selected African artisans to confirm patterns in the initial data set. Both datasets revealed that artisans could gain brand awareness through Instagram commerce and build their network through literature in the short term. However, other factors, such as the quality of posts and the quality of the artisans' network, play a role in achieving brand awareness. From the literature, the increasing brand awareness due to frequent posting and the quality of the artisans' following can lead to sales and improve the artisans' social livelihoods.

Keywords: Instagram, e-commerce, artisans, livelihoods, followers, brand awareness

1. Introduction

Instagram commerce is a sub-set of e-commerce (Javida, et al., 2019) known as social commerce (Wang, et al., 2020). Social media commerce is a viable alternative to investigate for artisans because the Internet has become widespread (Jashari & Rustemi, 2017), and people are transitioning from traditional media to social media (Oh, et al., 2017). Social media adoption rates among businesses are increasing because it allows cross-border direct two-way communication between a company or seller and the buyer (Khobzi, et al., 2018). Moreover, with social media updates and tools, sellers can customise their advertising to suit a person's online interests and profiles (Youn & Shin, 2019). Instagram, a social media platform, is chosen for this research because it encompasses an e-commerce feature within it, making it both a social and an e-commerce platform.

However, the impact of the use of Instagram among artisans will depend on certain variables. This research's independent variables are the frequency of posts and the number of people an artisan follows. The dependent variable will be the number of followers the artisan has. To determine how these response variables react, it is key to understand the kind of independent variables that will interact with them. For example, the individual-level factors of the artisans can impact the dependent variables. These individual-level factors include but are not limited to the artisans' education level, age, experience using Instagram, reputation as an artisan outside Instagram, and gender. For example, a study conducted by Albaity and Rahman (2019) showed that reputation positively affects attitudes regarding Islamic banking services. Similarly, an independent variable, such as an artisan's reputation outside social media, may influence Instagram commerce.

While understanding the interacting variables, it is key to understand what factors moderate and mediate (Fiedler and Sivo, 2015) this research and will feed into the study's scope, context and limitations. These moderating factors include the intermediaries of Instagram commerce, the organisation of a particular sector at the Arts Centre and certain individual-level factors. The mediating factors will be the Design Lab project that trains the artisans on Instagram commerce and the quality of the training.

These variables are essential background information, focusing the research and clearly defining the scope.

1.1 Problem Statement

The Accra Arts Centre nurtures artisans' crafts through programmes and exhibitions. However, the Arts Centre demolition due to the Marine Drive project means artisans at the Centre need to look at alternative ways of selling their crafts. With the increasing adoption of social commerce and the absence of investigating specific social media platforms on artisans' livelihoods in literature, studying Instagram as a viable tool for artisans' trade emerges. Moreover, establishing the short-term impact of Instagram commerce on livelihoods can be a source of economic benefit to the artisans.

1.2 Research Question

1. How does Instagram commerce affect brand awareness of the artisans' products?
2. What is the likelihood of increased sales and a positive impact on livelihoods when using Instagram tools?

1.3 Research Objectives

This paper aims to understand if Instagram commerce is a viable alternative or supplement in creating sustainable livelihoods for local artisans. Specifically, this study will focus on:

1. Understanding the contextual factors that contribute to the success or failure of e-commerce among artisans in Ghana
2. Measure the effectiveness of Instagram commerce on brand awareness of artisans
3. Increase the economic benefit of Ghanaian artisans through Instagram commerce

1.4 Significance of the Study

Previous research has looked at the impact of social media on local artisans in different locations. However, the study looked at how this affected other marketing elements, such as brand equity and brand awareness but did not distinguish how these factors impacted artisans' livelihoods. Some research, which attempted to make this linkage, limited its scope to people who could potentially become teachers of their crafts. Moreover, there is little understanding of Instagram adoption in a country such as Ghana, with high mobile penetration but low internet connectivity (Meltwater, 2023). Moreover, there is a need to study individual social media platforms because although findings from other platforms can be generalised, the uniqueness of each service can impact the conclusions. Hence, the scope focuses on local artisans using Instagram to promote and sell their craft and understand how Instagram marketing may impact their businesses and can help other artisans.

2. Method

The Ashesi Design Lab (D:lab), in collaboration with Dr Zanetor Agyeman-Rawlings, a member of parliament in Ghana for the Korle Klottey constituency, is training artisans at the Accra Arts Centre on Instagram commerce. The data for this research was obtained by studying this phenomenology. Within four months, over 40 artisans were sampled using stratified sampling. The artisans were from four sectors at the Accra Arts Centre: The Northern and Southern sectors, Textiles, and wood carvings. However, out of this sample, forty-two were chosen for the data analysis. The criterion used depended on whether the artisans had finished all the modules of the Instagram training and thus had a substantial knowledge of Instagram. Data was also obtained via interviews with the artisans and key stakeholders, including the Centre leaders and trainers of the D-lab project.

Additionally, observation of participants was used to monitor their receptiveness to the program. Furthermore, with the artisans' permission, their Instagram analytics were obtained and analysed to assess trends. Regression analysis was used to determine the relationship between the independent and dependent variables and the strength of these relationships.

A second data set was obtained 42 from artisans across Africa, that had used Instagram for more than a year, with a mean of four years, and had at least 500 followers. This was to gain external validity of insights gained from the first data set (Dion, 1998).

3. Results

For the Accra Arts Centre artisans, the multiple linear regression shows that the frequency of posts and the number of people an artisan follows have a statistically significant relationship with the number of followers. For the dependent variable 'frequency' ($\beta = 33.67$, $SD = 6.77$, $P\text{-value } 3.32e-06$), the results suggest that for every other post made, the number of followers increases by approximately 33.67 (holding other variables constant). Whereas for the dependent variable 'following', for every additional person the artisan follows, the number of followers decreases approximately by 1.09 (holding other variables constant). The p-value indicates the expected number of followers when the frequency of posts and the number of people followed are zero.

With the selected African artisans, the multiple linear regression also shows that the frequency of posts and the number of people an artisan follows have a statistically significant relationship with the number of followers. For the dependent variable 'frequency' ($\beta = 16.74$, $SD = 2.60$, $P\text{-value} = 1.44e-09$), the results suggest that for every other post made, the number of followers increases by approximately 16.47 (holding other variables constant). Whereas for the dependent variable 'following', for every additional person the artisan follows, the number of followers increases approximately by 0.19 (holding other variables constant).

4. Discussion

The results from the Art Centre artisans show that the frequency of posts can increase the number of followers; however, following too many people can affect the number of followers. Conversely, the external validity from the dataset of the selected artisans showed that the more persons an artisan follows, there is a positive effect, although this is marginal. This positive effect is not surprising as the selected African artisans had been using Instagram for a mean of four years and therefore aligns with the concept of network centrality in social analysis network theory (Breiger, 2014). This concept propounds that persons with high network centrality are more likely to have more influence and, thus, gain more traction on social media. Therefore, the artisans using Instagram have gained a higher level of centrality and thus can either gain followers once they follow another or, at the very least, not lose followers. However, the Art Centre Artisans have not gained much centrality due to their recent Instagram onboarding, and it is possible that following other accounts instead has the reverse effect. However, this variable's marginality shows that it may not be the most important for artisans in the short term. However, both datasets show a strong linkage between the frequency of posts and gaining followers. Therefore, if an artisan would like to transform their livelihoods by gaining sales on Instagram, they should first possibly aim to gain brand awareness through frequent posting. However, from observation, other variables can play a role, such as the quality of the posts. From observation, the quality of the posts of the selected African artisans varied vastly, whereas they used hashtags, descriptive captions, and a variety of Instagram tools. These could also be factors that influence the difference in traction gained by these artisans (Tafesse and Wien, 2016), as opposed to the Art Centre artisans.

5. Further Research

Further research should examine other independent and dependent variables to understand better Instagram's role in affecting artisans' livelihoods and improve generalizability. Moreover, an intermediary present in this research was the Digital Business Transformation Initiative, which could have impacted the artisans' usage and receptiveness to Instagram. Therefore, further research can explore this topic further, without intermediaries or using a different means for artisans onboarded to Instagram, to determine if the conclusions differ.

References

- Albaity, M. & Rahman, M., 2019. The intention to use Islamic banking: an exploratory study to measure Islamic financial literacy. *International Journal of Emerging Markets*, 14(5), pp. 988-1012.
- Breiger, R. (2014). Book Review: Social Network Analysis, Third Edition & What Is Social Network Analysis? *Connections*, 34(1). doi:https://doi.org/10.17266/34.1.10.
- Dion, D. (1998). Evidence and Inference in the Comparative Case Study. *Comparative Politics*, 30(2), p.127. doi:https://doi.org/10.2307/422284.
- Fiedler, B.A. and Sivo, S.A. (2015). Testing Baron and Kenny's Preliminary Conditions for Mediating or Moderating Variables in Structural Equation Modeling. *Advances in Social Sciences Research Journal*, 2(8). doi:https://doi.org/10.14738/assrj.28.1352.
- Jashari, F. & Rrustemi, V., 2017. The impact of social media on consumer behavior—Case study Kosovo. *Journal of Knowledge Management, Economics and Information Technology*, pp. 1-21.
- Javida, E., Nazaria, M. & Ghaelia, M., 2019. Social media and e-commerce: A scientometrics analysis. *International Journal of Data and Network Science*, pp. 269-290.
- Khobzi, H., Lau, R. & Cheung, T., 2018. The outcome of online social interactions on Facebook pages: A study of user engagement behavior. *Internet Research*, 29(1), pp. 2-23.
- Meltwater 2023, *Digital 2023 Ghana*.
- Oh, C., Roumani, Y., Nwankpa, J. & Hu, H.-F., 2017. Beyond likes and tweets: Consumer engagement behavior and movie box office in social media. *Information and Management*, 54(1), pp. 25-37.
- Serrat, O., 2017. The Sustainable Livelihoods Approach. In: *Knowledge Solutions*. Singapore: Springer, pp. 21-26.
- Wang, X., Tajvidi, M., Lin, X. & Hajli, N., 2020. Towards an Ethical and Trustworthy Social Commerce Community for Brand Value Co-creation: A trust-Commitment Perspective. *Journal of Business Ethics*, 31(11), pp. 137-152.
- Tafesse, W. and Wien, A. (2016). A Framework for Categorizing Social Media Posts. *SSRN Electronic Journal*. doi:https://doi.org/10.2139/ssrn.2824385.
- Youn, S. & Shin, W., 2019. Teens' responses to Facebook newsfeed advertising: The effects of cognitive appraisal and social influence on privacy concerns and coping strategies. *Telematics and Informatics*, pp. 30-45.