

Understanding Knowledge Sharing Among Millennials Using a Processual Nonlinear Model: A Longitudinal Qualitative Study

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Abstract: This study investigates the temporal complexity of knowledge sharing (KS) among Polish working millennials, integrating complexity and configurational theories with social motivation and social cognitive perspectives. It explains how trust, reciprocity, and knowledge features drive KS through motivation and self-assessment over time. We employed a time-lagged research design, collecting survey data across multiple waves. Sequential fuzzy-set qualitative comparative analysis (fsQCA) was applied to uncover causal configurations leading to both the occurrence and non-occurrence of KS. Results highlight the nonlinear and configurational nature of KS, showing that combinations of trust, reciprocity, and knowledge features (combined with motivation and self-assessment) explain temporal patterns of KS. Distinct causal recipes account for both successful knowledge sharing and its absence, demonstrating the dynamic and contingent character of the phenomenon. The findings provide actionable insights for managers seeking to enhance KS practices. Interventions should focus on cultivating trust and reciprocity while reinforcing employees' motivation and self-assessment capacities to sustain long-term knowledge exchange. This study offers original longitudinal evidence on the processual mechanisms underpinning KS among millennials. By combining configurational and temporal perspectives, it advances understanding of how social and cognitive factors interact to foster or inhibit KS.

Keywords: Knowledge sharing, Millennials, Longitudinal study, Fuzzy-set qualitative comparative analysis

1. Introduction

Knowledge sharing (KS) is the most relevant knowledge management process for achieving competitiveness (Sun *et al.*, 2022). Previous work describing KS has referred to social motivation theory (SMT) (Chiu *et al.*, 2006). The literature offers evidence in support of knowledge characteristics explaining the self-assessment of KS behavior, namely, knowledge complexity and knowledge complementarity (Sudhindra *et al.*, 2020). Diverse (complementary) sources of knowledge are required to address knowledge complexity (Sudhindra *et al.*, 2020). However, no empirical attempts have been made to integrate motivation and complexity to clarify our understanding of how KS is generated. Therefore, we do not know how well these two factors can explain KS. Previous cross-sectional work presents limitations that can only be overcome by adopting a longitudinal design to effectively explain KS (Lin *et al.*, 2014).

KS behavior should be studied within a homogenous sample, such as millennials who exhibit distinct characteristics (Andriani *et al.*, 2022). As a result, we question how KS emerges over time from a motivation- and cognitive-based perspective. Although KS has been widely studied, it has been mostly addressed in a Western-oriented frame of reference; so, research must also explore KS-related phenomena in non-Western European cultural contexts (Jiacheng *et al.*, 2010), where Western-style KS assumptions may not be supported (Chow *et al.*, 1996). We conducted a study on KS with a focus on Polish millennials.

As KS is a complex phenomenon across different industries (Curado *et al.*, 2021; Gonçalves *et al.*, 2022), we used a sequential qualitative comparative approach to discover alternative arrangements of conditions that generate and inhibit KS. Complexity theory is appropriate for addressing the asymmetric relationships between conditions and outcomes (Kopplin and Rösch, 2021) as it comprehensively considers alternative ways to reach KS and the paths that prevent KS. We used several conditions that affect KS, including the contributions of social motivation (Gu and Gu, 2011) (via trust and reciprocity) and the cognitive perceptions of self-assessment (due to complex and complementary knowledge) in nonlinear complex interactive combinations that lead to and prevent KS. The findings illustrate the complexity of the KS phenomenon and the perils of considering the linear effects of motivation and self-assessment on generating and inhibiting KS. Moreover, they allow us to present alternative recipes that generate and prevent KS.

2. Literature Review

2.1 Motivation for KS Related Conditions

Complexity theory supports the study of real-world phenomena through empirical datasets (Woodside, 2017). Because reality is nonlinear and the same conditions may yield different effects (French *et al.*, 2023),

configurational approaches are appropriate for examining individual behavior. SMT (Geen, 1991) predicts participation in KS (Gu and Gu, 2011; Venkatesh et al., 2022). Social motivation encompasses recognition and influence, including peer pressure and cognition that shape behavior (Khan et al., 2018). Bandura's SCT further informs motivational research. As KS depends on individuals (Nguyen et al., 2022), a key challenge is the tendency to treat professional knowledge as a personal asset for self-enhancement (Nguyen and Malik, 2020). KS is driven by trust and reciprocity (Akhavan and Hosseini, 2016; Nguyen et al., 2022). Trust underpins KS (Akhavan and Hosseini, 2016), as individuals share knowledge when they believe it will not be misused (Kankanhalli et al., 2005). Reciprocity, though less examined (Nguyen and Malik, 2020), is equally central (Nguyen et al., 2022).

Reciprocity suggests that KS depends on expectations of others' future sharing (Chang et al., 2015). Trust develops gradually (Hsu and Lin, 2008) but is reinforced by reciprocal exchanges, which stimulate sharing even at low levels (Akhavan and Hosseini, 2016). Engagement in reciprocal systems strengthens KS (Lin, 2007) and helps sustain trust (Nguyen et al., 2019). SMT supports the role of trust in KS (Chiu et al., 2006). Trust reflects confidence in not being harmed by sharing (Ng, 2023) and is fundamental to KS (Nguyen et al., 2022). In its absence, motivation declines (Masood et al., 2023).

Grounded in social exchange principles (Kim and Kim, 2021; Hatamleh et al., 2023), reciprocity encourages the exchange of valuable resources such as knowledge (Henriques et al., 2019). It operates largely through intrinsic rewards (Nguyen et al., 2022), fostering sustained motivation (Nguyen and Malik, 2020). Individuals expect equivalent returns (Kankanhalli et al., 2005), reinforcing reciprocal KS cycles (Nguyen et al., 2019). As reciprocity deepens, willingness and value increase (Lin, 2007), creating a virtuous cycle (Zaremohzzabieh and Rashid, 2025). In line with SCT (Gu and Gu, 2011; Khan et al., 2018), reciprocity first builds and then maintains a climate of trust as participation expands. Thus, given the above, we propose the following:

Proposition 1 (P1): Trust and reciprocity are required to generate motivation for KS.

2.2 Self-assessment for KS Related Conditions

Individual actions are shaped by self-efficacy and outcome expectations. Self-efficacy refers to beliefs about one's capability to organize and perform behaviors and influences decisions to share knowledge (Kankanhalli et al., 2005). Motivation should be examined longitudinally within SCT (Schunk and DiBenedetto, 2020; Bandura, 2009). Knowledge characteristics—complexity and complementarity—relate to knowledge self-efficacy. SCT supports their relevance when individuals assess their capacity for KS. Complementarity directly enhances KS by integrating diverse inputs, whereas complexity requires complementary sources to address intricate problems (Sudhindra et al., 2020). However, increasing knowledge refinement in intensive environments may create distress and hinder KS (Connelly et al., 2012). Knowledge complexity (Audretsch and Belitski, 2021; Connelly et al., 2012) and complementarity (Richard et al., 2023) are key determinants. Although findings are mixed (Sudhindra et al., 2020), complementarity directly promotes KS, while complexity may stimulate learning capabilities that indirectly foster KS.

Knowledge complexity denotes the extent to which organizational knowledge demands abstraction and integration to overcome incomprehensibility (Hang and Kim, 2025). It is often associated with instability, prompting compensatory engagement in KS (Hang and Kim, 2025). Facilitating access to diverse knowledge reduces distribution costs and supports cooperation (Audretsch and Belitski, 2021), limiting knowledge hiding (Hang and Kim, 2025). Complexity may promote KS when organizational cultures encourage communication and expert guidance (Sudhindra et al., 2020). Such evidence supports nonlinear causality across sectors (Audretsch and Belitski, 2021; AlGhaithy and Al-Busaidi, 2025). Complementarity operates at the individual level, combining unique expertise to solve complex problems (Richard et al., 2023). Because no actor possesses all necessary knowledge, distribution within networks enhances substitutability capacity (Sudhindra et al., 2020; Lin et al., 2025) and supports KS development. The emergence of new knowledge aligns with KS self-efficacy (Lin et al., 2025). Enactive mastery and vicarious experiences, such as sharing tacit problem-solving knowledge, strengthen KS behavior within SCT (Bandura, 2009). Therefore, given the above, we propose the following:

Proposition 2 (P2): The combination of knowledge features of complexity and complementarity contributes to individual self-assessment for KS.

2.3 Knowledge Sharing

KS is "the process where individuals mutually exchange their knowledge and jointly create new knowledge" (van den Hooff and Rider, 2004:118). Intrinsic motivators, such as knowledge, self-efficacy, and enjoyment in helping

others, are important in explaining employee KS (Lin, 2007). Intrinsic motivation is demonstrated by an individual enjoying work while achieving accomplishments in the process (Sun *et al.*, 2022). Intrinsic motivation is derived from personal norms and affects KS (Jiacheng *et al.*, 2010).

Using SMT and SCT, we propose that the effects of previously developed individual motivation and self-assessment generate subsequent expected behavior: generate and inhibit KS. According to the configurational theory, several configurations demonstrating complex, nonlinear causality can lead to the same outcome. Consequently, we propose that more than one configuration leads to outcomes. Given the complexity of the social causes that lead to individual behavior discussed in the previous literature, we propose that the ways to generate KS are not opposite or symmetrical to those that inhibit it. Accordingly, we propose the following:

Proposition 3 (P3): Alternative combinations of individual motivation and self-assessment for KS precede KS generation over time.

Proposition 4 (P4): The combinations of individual motivation and self-assessment for KS that generate KS over time are not the opposite of those that inhibit KS.

We use a Venn diagram to illustrate the resulting sequential Boolean research model, as shown in Figure 1.

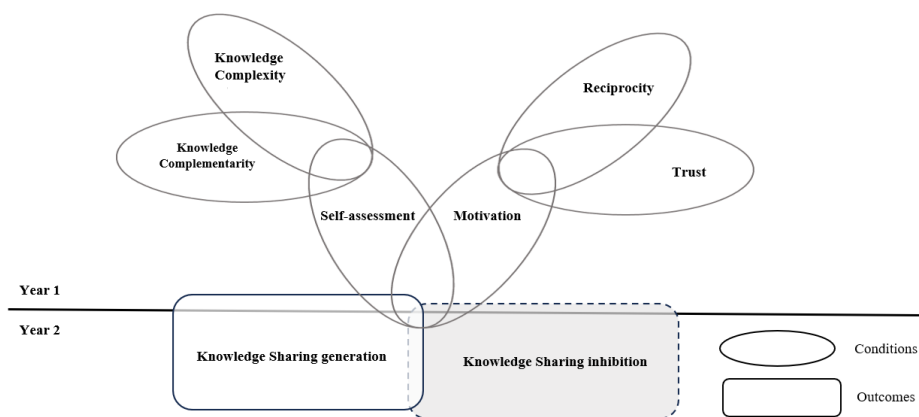


Figure 1: Boolean research model

3. Method

We adopted a longitudinal qualitative approach to better understand not only the sequential order of influences and alternative ways leading to KS among non-Western millennials but also the ones inhibiting KS. The strength of a longitudinal approach is that it allows us to study phenomenon development (Saunders *et al.*, 2016:200). We chose a qualitative research design that permits the use of an abductive approach by developing inductive propositions based on the literature review, followed by a deductive non-generalizable iterative data test (Saunders *et al.*, 2016:168). We also employed a mono method qualitative design as we opted for a single data collection technique and qualitative analytical procedure (Saunders *et al.*, 2016:168).

Given the complexity of social phenomena, a single condition or recipe may not be the only way to generate complex organizational outcomes (von Thiele Schwarz, et al., 2024), when considering psychosocial phenomena (Dai et al., 2024), such as knowledge sharing. Complexity and configurational theories accept the principles of equifinality and causal asymmetry (Miao *et al.*, 2022). We use complexity theory (García-Ramos and Díaz, 2021; Ragin, 2008; Woodside, 2013) to explain KS because (a) it accepts complex causality, (b) only combinations of conditions can generate KS, and (c) no single condition or solution results in KS given that KS is a complex social phenomenon (Curado *et al.*, 2021; Gonçalves *et al.*, 2022).

We explored our dataset by looking for alternative combinations of conditions that lead to the same outcomes (García-Ramos and Díaz, 2021). We employ a longitudinal approach and adopt a sequential configurational model to study the ways to generate and inhibit KS; with this approach, we analyzed temporally ordered configurations (e.g., Hak *et al.* 2013) to discover the alternative recipes that generate and inhibit KS at the end of a one-year lag period.

3.1 Data Collection, Sample, and Measures

Data were collected through a survey conducted among working Polish millennials over two consecutive years. The participants attended a master's program in business and were selected using convenience sampling, following procedures in the literature (Villanueva *et al.*, 2022). Millennials were born between 1980 and 2000 and present different characteristics from preceding generations (Kavanagh *et al.*, 2021); so, we limited our study to millennials to identify the complexity of KS in this generation. Participants in year 1 (2024) and year 2 (2025) were the same, as only those respondents who participated in both periods were considered in accordance with a procedure in the literature (Gabay-Mariani *et al.*, 2023; Villanueva *et al.*, 2022). The initial sample comprised 44 individuals.

We use a longitudinal design to better explain the KS phenomenon, it enhances the understanding of the dynamics of KS (Jiacheng *et al.*, 2010) overcoming the limitations of previous studies (Lin *et al.*, 2014). With a longitudinal perspective design (Villanueva *et al.*, 2022) we can also provide evidence for the generation of KS over time. In this case, the conditions before the development of positive and negative outcomes (to generate, and to inhibit, KS.) must be measured to avoid retrospective bias and draw possible causal conclusions. Following Villanueva and colleagues (2022), we asked for volunteers for both data collection periods. Participants who did not answer 100% of the questionnaire items in year 1 were removed from the research project ($n=11$). We gathered data at two different points: year 1 wherein the conditions were measured and one year later in year 2 wherein the outcome was measured (Gabay-Mariani *et al.*, 2023). Thus, we minimized common method variance concerns (Podsakoff *et al.*, 2003). The final sample comprised 33 individuals aged 21-26 years ($M=23.5$ years; $SD=0.9$ years) who were attending a master's program at a business school in Cracow, Poland; 29 individuals were female (87.8%).

We applied measures from the literature using a 5-point Likert scale. Trust (Lee and Choi, 2003) (six-item scale) (Cronbach's $\alpha=0.835$). Reciprocity (Kankanhalli *et al.*, 2005) (four-item scale) (Cronbach's $\alpha=0.745$). Motivation (Ferreira *et al.*, 2006) (11-item scale) (Cronbach's $\alpha=0.777$). Knowledge complexity (Subramaniam and Venkatraman, 2001) (six-item scale) (Cronbach's $\alpha=0.857$). Knowledge complementarity (Subramaniam and Venkatraman, 2001) (six-item scale) (Cronbach's $\alpha=0.626$). Self-assessment (Viswesvaran *et al.*, 1996) (seven-item scale) (Cronbach's $\alpha=0.794$). KS (Huang, 2009) (four-item scale) (Cronbach's $\alpha=0.716$).

3.2 Fuzzy-Set Qualitative Comparative Analysis

FsQCA is grounded in Boolean algebra and addresses necessity and sufficiency relationships. It aligns with complexity theory (García-Ramos and Díaz, 2021) and treats conditions nonlinearly (Fiss, 2011), enabling a deeper understanding of KS by uncovering complex causal patterns such as equifinality, conjunctural causation, asymmetry, and asymmetric causality.

We adopted fsQCA because no single condition can produce KS; only specific combinations of conditions, or recipes, can do so under complexity theory. Asymmetry indicates that conditions present in one configuration may be absent or inversely related in another yet still produce the same outcome (García-Ramos and Díaz, 2021). This reflects the complexity of phenomena, as different configurations can converge on identical results. Asymmetric causality further implies that configurations generating an outcome are not simply the inverse of those inhibiting it (Um *et al.*, 2023); causal and inhibiting recipes are fundamentally distinct (Rihoux and Ragin, 2009). Following established guidelines, fsQCA proceeded in three stages: calibration, necessity analysis, and sufficiency analysis (Schneider and Wagemann, 2012).

Calibration relies on theoretical and empirical knowledge to transform raw data into set membership scores using three thresholds (Ragin, 2008). Likert-scale data were converted into fuzzy sets by computing mean values (Woodside *et al.*, 2011) and applying established cutoffs (Woodside *et al.*, 2015). The 95th, 5th, and 50th percentiles indicate full membership, full non-membership, and maximum ambiguity, respectively (Fiss, 2011) (Table 1).

Table 1: Descriptives and calibration

Conditions and Outcomes	Max	Min	Average	Stand Dev	Calibration cuts at 0.95; 0.50; 0.05
Recip (year 1)	5.00	1.75	4.04	0.66	4.8; 4.1; 2.8
Trust (year 1)	4.67	2.00	3.30	0.47	4.1; 3.3; 2.6
MotKS (year 1)	4.55	2.64	3.64	0.44	4.3; 3.7; 3.0

Conditions and Outcomes	Max	Min	Average	Stand Dev	Calibration cuts at 0.95; 0.50; 0.05
Compl (year 1)	4.50	2.67	3.61	0.38	4.3; 3.6; 3.1
Compx (year 1)	4.00	1.50	2.92	0.54	3.9; 2.9; 1.9
SelfKS (year 1)	4.71	2.86	3.82	0.45	4.7; 3.8; 3.1
KS (year 2)	5.00	1.00	3.45	0.83	4.9; 3.6; 1.1

Recip=reciprocity; MotKS=motivation for KS; Compl=knowledge complementarity; Compx=knowledge complexity; SelfKS=self-assessment for KS; KS=knowledge sharing.

Necessity and sufficiency analyses followed best practices (Greckhamer *et al.*, 2018). Regarding both outcomes (generation of KS and KS prevention) none of the conditions were necessary for the outcomes. Necessity analysis reveals the degree of the effect of a condition on achieving a specific result and is performed in relation to generating and inhibiting KS. According to Ragin (2008) a condition is necessary to achieve the outcome of interest if its consistency and coverage scores are greater than 0.90. As shown in Tables 2, 3, and 4, there are no necessary conditions for generating and inhibiting KS. (marked as “~” hereafter) of motivation for KS in year 1, self-assessment for KS in year 1, and KS behavior in year 2, respectively.

Table 2: Necessary conditions for motivation for KS occurrence (year 1)

MotKS(year 1)			
Conditions	Consistency	Coverage	Relevance of necessity
Recip(year 1)	0.796288	0.670417	0,709943149
~Recip(year 1)	0.512108	0.534480	0,726992913
Trust(year 1)	0.682491	0.665186	0,765256616
~Trust(year 1)	0.625827	0.558835	0,674980589

MotKS=motivation for KS; Recip=reciprocity; ~Recip=no reciprocity; ~Trust=no trust.

Table 3: Necessary conditions for self-assessment for KS occurrence(year 1)

SelfKS(year 1)			
Conditions	Consistency	Coverage	Relevance of necessity
Compl(year 1)	0.727659	0.738362	0,804892921
~Compl(year 1)	0.653752	0.624810	0,684337935
Compx(year 1)	0.694345	0.671478	0,746007812
~Compx(year 1)	0.645350	0.646792	0,745815233

SelfKS=self-assessment for KS; Compl=knowledge complementarity; Compl=no knowledge complementarity; Compx=knowledge complexity; Compx=no knowledge complexity.

Table 4: Necessary conditions for knowledge KS occurrence and non-occurrence (year 2)

KS(year 2)				~KS(year 2)		
Conditions	Consistency	Coverage	Relevance of necessity	Consistency	Coverage	Relevance of necessity
MotKS(year 1)	0.581211	0.636573	0,759211296	0.671975	0.706004	0,702063964
~MotKS(year 1)	0.731573	0.699242	0,743695406	0.654090	0.599719	0,685551574
SelfKS(year 1)	0.681548	0.706788	0,778714238	0.671835	0.668337	0,702063964
~SelfKS(year 1)	0.680181	0.683614	0,753888771	0.705253	0.679941	0,751741281

KS=knowledge sharing; KS=non-occurrence of KS; MotKS=motivation for KS; ~MotKS=no motivation for KS; SelfKS=self-assessment for KS; and ~SelfKS=no self-assessment for KS.

Sufficiency analysis indicates the degree of the relationship between the configuration of conditions as an explanation for a specific result or outcome (Fiss *et al.*, 2013). We used fsQCA 2.9 software to perform the Quine–McCluskey algorithm and compute all possible combinations (Gabay-Mariani *et al.*, 2023). The best

practices for fsQCA (Greckhamer *et al.*, 2018; Ragin, 2008) prescribe the use of the intermediate solution, in this case, the one leading to KS and the one inhibiting KS (Fiss, 2011; Fiss *et al.*, 2013; Ragin, 2008). In the current study, all configurations and overall solutions met the threshold by Ragin (2008) with consistency scores greater than 0.75. The overall solutions' coverage scores are within the suggested limits of 0.25 and 0.90 (Ragin, 2008; Woodside and Zhang, 2013). All the conditions in both tables were core conditions, reflecting their importance in the outcomes of interest. Tables 5, 6, 7, and 8 present the sufficiency analyses of configurational modeling. Tables V and VI show the intermediate solutions for motivation toward KS and self-assessment for KS measured in year 1, respectively. Tables 7 and 8 show the intermediate solutions for the development of positive and negative outcomes (generate and inhibit KS.) in year 2. The findings reported in Table 5 support Proposition 1, that is, trust and reciprocity are required to generate motivation for KS. The findings reported in Table 6 support Proposition 2, that is, the knowledge features of complexity and complementarity determine individuals' self-assessment of KS. The findings reported in Table 7 support Proposition 3, that is, alternative combinations of individual motivation and self-assessment for KS precedes KS generation over time. The findings reported in Table 8 support Proposition 4, that is, the combinations of individual motivation and self-assessment for KS that generate KS over time are not the inverse of those that precede KS inhibition.

Table 5: Model:MotKS(year 1)=f(Recip (year 1), Trust(year 1))

Configuration	Coverage		Consistency	Interpretation of configurations
	Raw	Unique		
Recip(year 1) *Trust(year 1)	0.560634	0.560634	0.800348	During the first year, high levels of reciprocity and trust lead to high levels of motivation toward knowledge sharing

Solution coverage=0.560634; solution consistency=0.800348; MotKS=motivation for KS; Recip=reciprocity.

Table 6: Model:SelfKS(year 1)=f(Compl(year 1), CompX(year 1))

Configuration	Coverage		Consistency	Interpretation of configurations
	Raw	Unique		
Compl(year 1) *CompX(year 1)	0.540951	0.540951	0.862559	During the first year, high knowledge complementarity and knowledge complexity lead to high self-assessment for knowledge sharing

Solution coverage=0.540951; solution consistency=0.862559; SelfKS=self-assessment for KS; Compl=knowledge complementarity; CompX=knowledge complexity.

Table 7: Model:KS(year 2)=f(MotKS(year 1), SelfKS(year 1))

Configuration	Coverage		Consistency	Interpretation of configurations
	Raw	Unique		
~MotKS(year 1) *SelfKS(year 1)	0.446174	0.197437	0.839671	The absence of motivation for KS and high self-assessment for KS during the first year leads to high levels of KS in the second year
MotKS(year 1) *~SelfKS(year 1)	0.380470	0.131733	0.792466	High levels of motivation for KS and no self-assessment for KS in the first year lead to high levels of KS in the second year

Solution coverage=0.577907; solution consistency=0.789295; KS=knowledge sharing; MotKS=motivation for KS; ~MotKS=no motivation for KS; SelfKS=self-assessment for KS; ~SelfKS=no self-assessment for KS.

Table 8: Model:~KS(year 2)=f(MotKS(year 1), SelfKS(year 1))

Configuration	Coverage		Consistency	Interpretation of configurations
	Raw	Unique		
~MotKS(year 1) *~SelfKS(year 1)	0.580700	0.580700	0.914804	The absence of motivation for KS and self-assessment for KS in the first year leads to the non-occurrence of KS in the second year

Solution coverage=0.580700; solution consistency=0.914804; ~KS=non-occurrence of KS; ~MotKS=no motivation for KS; ~SelfKS=no self-assessment for KS.

4. Discussion and Implications

Following SMT and as proposed, we verify that trust and reciprocity are required to generate motivation for KS (Table V) since intrinsic motivation is derived from personal norms and affects KS (Jiacheng *et al.*, 2010). In line with SCT, the knowledge features of complexity and complementarity generate high self-assessment for KS (Table VI). Considering that the sense of perceived self-assessment contributes to self-efficacy (Bandura, 2009:183) and given our findings, we expect Polish millennials to have high self-efficacy when addressing complex and complementary knowledge. The sufficiency analysis reported in Table VII shows that KS in year 2 is a product of the two conditions developed in year 1, supporting the complexity theory assumptions. It shows two alternative configurations leading to KS, supporting Proposition 3. Moreover, the recipes for KS are not the opposite of those that inhibit KS, illustrating asymmetric causality. Year 2 has no KS if millennials develop no motivation for KS and do not conduct self-assessment for KS in year 1 (Table VIII). Based on SMT and SCT and as proposed, the effect of previously developed individual motivation and self-assessment generates subsequent KS (Table VII) and inhibit subsequent KS (Table VIII). Therefore, our findings confirm that KS is determined by the *ex-ante* presence or absence of conditions (Jeon *et al.*, 2011). The motivation and self-assessment developed in year 1 compensate for each other in the following year such that in year 2, the occurrence of one counterweighs the non-occurrence of the other in generating KS (Table VII).

The absence of both inhibits KS (Table VIII). This study shows that KS among millennials in a non-Western context is the result of complex causation, by identifying the configurations that lead to, and inhibit, KS. Thus, we provide a framework for longitudinal nonlinear combinations of motivation and self-assessment to explain KS generation, providing a new perspective on the complex subject of KS behavior. We offer evidence of the sequential order of influence and alternative ways of generating KS. Additionally, we provide a parallel longitudinal sequence that inhibits KS. These findings further deepen our understanding of the dynamics of KS because the study expands the use of complexity theory (García-Ramos and Díaz, 2021) to the domains of SMT and SCT. As a result, the theoretical assumptions are supported by the evidence, as presented in Table IV (SMT) and Table V (SCT), and the contribution of both to KS. The findings may benefit human resource (HR) managers about their relationship with millennials and the ways to promote KS in this generation for the benefit of individual and organizational performance. HR managers should foster practices such as the following to build motivation toward KS among millennials by developing human resource management (HRM) practices and policies that are based on trust and stimulate reciprocity. The complexity surrounding individual responses to HRM practices and policies is parallel with the reality of the knowledge management discipline when discussing knowledge as a socially motivated resource (Gu and Gu, 2011).

HR practices to stimulate feelings of trust and reciprocity among millennials should also consider their moral and work values (Papavasileiou and Lyons, 2015), addressing corporate social responsibility to establish trust in management (Badar and Lasthuizen, 2023). HR managers should foster self-assessment for KS by developing HRM practices and policies that involve complex and complementary knowledge in tasks. The findings suggest that only the combined influence of knowledge complexity and complementarity fosters a higher self-assessment of KS, empirically clarifying previous arguments on the need to diffuse knowledge when problem solving is required (Richard *et al.*, 2023; Sudhindra *et al.*, 2020).

5. Conclusions

Our study provides theoretical and empirical expansions by explaining the temporal complexity of KS among millennials in a non-Western context based on complexity and configurational theories and with the use of fsQCA (Ragin, 2008). Using an asymmetric method, we expand the literature on the longitudinal formation of KS. We offer an accurate explanation of how KS generates overtime by considering individual conditions and knowledge characteristics, by: a) Demonstrating the longitudinal complexity of KS; b) Moderating/reducing the sequential ambiguity of KS by providing the recipes that generate it; c) Increasing the understanding of the longitudinal nonlinear generation of KS, and d) Exposing the longitudinal path that inhibits KS.

Our work presents innovative research by combining a time-lagged approach using fuzzy-set comparative analysis, offering a two-fold contribution to the knowledge management literature by addressing the nonlinear complexity of KS phenomena over time. Nevertheless, our study has several limitations that present challenges and opportunities for future research. The final sample size used in this study limits generalizations to the millennial population at large. Similarly, the sample is representative of Polish individuals, inviting future cross-country studies to understand the commonalities and contrasts of the findings based on cultural differences.

We also recommend exploring contextual influences in future research related to incentives for KS generation and prevention. The inclusion of such influences may further explain factors that foster and hinder KS.

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