The Role of Cognitive Style in Influencing Entrepreneurial Self-Efficacy and Subsequent Entrepreneurial Intention

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Abstract: Cognitive style has been largely acknowledged to highly contribute to explaining variances in individuals' behavior. However, very few researchers studied the role of cognitive style in influencing entrepreneurial self-efficacy along the entrepreneurial intention process. Therefore, the purpose of this research is to study how differences in preferences towards linear, non-linear and balanced thinking style would affect individuals' self-perceptions towards entrepreneurial self-efficacy and subsequent intentions to create a new business. This study's findings reported that non-linear thinking style is negatively correlated to entrepreneurial self-efficacy which subsequently affects entrepreneurial intentions negatively. While linear thinking style was positively correlated to entrepreneurial self-efficacy which in return affects entrepreneurial intentions positively. Moreover, thinking style balance was found to be positively correlated to entrepreneurial self-efficacy that exceeds the magnitude of the Linear-Entrepreneurial Self-Efficacy relationship which subsequently affects intentions positively. Furthermore, the relationship between entrepreneurial self-efficacy and entrepreneurial intentions had higher significance and was stronger in effect for individuals with balanced thinking style than for those with linear and non-linear thinking style.

Keywords: Cognitive style, Entrepreneurial self-efficacy, Entrepreneurial intention

1. Introduction

Cognitive Style is one of the main variables that was derived from the individual differences psychology discipline. It has been given significant attention among researchers and practitioners specifically in the innovation and entrepreneurship field (Armstrong and Hird, 2009). This is because cognitive style is considered a main determinant of individual behavior as it affects the way people gather and process information, solve problems and make decisions. Thus, it affects people's choices. Accordingly, this clarifies the significance of cognitive style within the entrepreneurship context as it may affect many key behaviors that entrepreneurs face on a daily basis (Kickul, Gundry, Barbosa and Whitcanack, 2009; Barbosa, Kickul and Smith, 2008**,** Armstrong and Hird, 2009; and Krueger and Day, 2010). Despite the fact that cognitive style has been a very popular research domain in business and management during the past 40 years, it is still considered under-researched as more empirical research is (Armstrong et al, 2012).

In 1988, pioneers in research introduced the concept of Intentions to cognition research which played a very important role in managerial literature (Bird, 1988). Consequently, past researchers have been widely adopting the intentions variable in their empirical studies to predict subsequent behavior. This is because measuring actual behavior is considered difficult and requires long time intervals (Hattab, 2014; Barbosa et al., 2007; Ajzen, 1991). Accordingly, in the entrepreneurship field various entrepreneurial intention models emerged to explain the factors that spur people to become entrepreneurs as this would help in fostering entrepreneurship (Linan, Rodríguez-Cohard and Rueda-Cantuche, 2011).

Over the past years, many entrepreneurship researchers have given considerable attention to examine the relationship between entrepreneurial self-efficacy and entrepreneurial intentions to start their own business. This is because entrepreneurial self-efficacy is believed to be a strong predictor of entrepreneurial intentions (Schlaegel and Koenig, 2014; Chen et al., 1998; Boyd and Vozikis,1994). Yet very few researchers studied the role of cognitive style in influencing entrepreneurial self-efficacy along the entrepreneurial intention process (e.g., Kickul et al., 2009; Barbosa et al, 2007). Although, the relationship between cognitive style and entrepreneurial self-efficacy is initially supported in the literature (Kickul et al, 2009; Vance, Groves, Gale and Hess, 2012), very little knowledge exists regarding how cognitive style would impact an individual's entrepreneurial self-efficacy and subsequent entrepreneurial intentions (Vanevenhoven and Liguori, 2013; Kickul et al, 2009). Therefore, this research effort stands to advance and contribute to the field of entrepreneurial cognition by initially studying the impact of cognitive style on entrepreneurial self-efficacy and subsequent entrepreneurial intentions. Moreover, this research aims to study how differences in individuals' cognitive styles either favouring linear, non-linear or balanced style would affect the relationship between entrepreneurial self-efficacy and entrepreneurial intentions to have a more vibrant picture of the processes that may lead to entrepreneurial behavior.

2. Literature Review

2.1 Cognitive Style

Allinson, Chell and Hayes, (2000, p.33) define cognitive style as *"a person's preferred way of gathering, processing and evaluating information"* that relates to creativity, problem-solving and decision making. Groves et al, (2011) classified individuals' cognitive style into three types, the first type is the non-linear "intuitive" cognitive style which embraces holistic thinking, creativity, experimentation, uncertainty, and freedom. The second type is Linear "analytical" cognitive style which is being driven by facts, data, rationality and being task oriented. The third type is a balanced cognitive style which is described as one being versatile in using either linear or non-linear thinking style depending on the situation at hand. It is worth noting that an individual's cognitive style may intentionally vary according to the unique constraints and conditions of a given situation (Groves et al, 2011; Allinson and Hayes, 1996).

Even though entrepreneurs were believed to have an intuitive thinking style as they are perceived to be creative and have high tolerance for ambiguity, it is suggested that both intuitive and analytical ways of thinking are needed to cultivate and stimulate the entrepreneurial capability. Olson and Bosserman, (1984) implied that in the early stage of the entrepreneurial process, entrepreneurs are more likely to employ the intuitive style as creativity and innovation are needed in identifying and capitalizing on the opportunity. While in later stages of the entrepreneurial process; planning, implementation and management phase, analytical thinking will be more prevalent. Therefore, it is proposed that entrepreneurs adopt both thinking styles when it comes to starting their own business. This means they have a great versatility in demonstrating either intuitive or analytical thinking style depending on the situation at hand and the various functional requirements needed for venture creation (Vance, Groves, Gale and Hess, 2012; Groves, Vance and Choi, 2011). Accordingly, this emphasizes the importance of balanced thinking style throughout the entrepreneurial process.

2.2 Entrepreneurial Self-Efficacy and Entrepreneurial Intention

Entrepreneurial self-efficacy (ESE) is defined as "the strength of confidence individuals have in their own abilities to successfully execute and perform various entrepreneurial roles and tasks" (Chen, Greene & Crick, 1998). Bandura, (1986) was the first to define self-efficacy as a task-specific construct meaning that it should be developed and evaluated with respect to specific tasks to enhance its predictive validity. The entrepreneurial process entails several tasks related to creating a new business such as searching for opportunities, planning for the new venture, marshaling resources, and implementing and creating the business (Vance et al, 2012; Kickul et al, 2009; McGee et al, 2009).

Entrepreneurial Intention is defined as "the conscious state of mind that precedes action and directs attention, experience and behavior toward a goal such as creating a new business" (Bird, 1988 as cited in Moriano, Laguna, Gorgievski and Stephan, 2012, p.5). It is worth mentioning that the prevailing intention models in literature employ self-efficacy as one of the critical antecedents of intentions (McGee et al, 2009; and Barbosa et al, 2007). Most of the widely adopted intention models are based on the most two popular theories in the literature. These two theories include a variable of self-efficacy; perceived behavioral control and perceived feasibility which were empirically found to positively predict entrepreneurial intentions in various studies. The first one is the theory of planned Behaviour developed by Ajzen, (1991) which has been extensively applied empirically (e.g., Ozaralli and Rivenburgh, 2016; Rauch and Hulsink, 2015). The second one is the theory of entrepreneurial event developed by Shapero and Sokol, (1982) which has been widely applied empirically as well (e.g., Walter and Block, 2016; Peterman and Kennedy, 2003). Furthermore, Entrepreneurial self-efficacy has been reported by various empirical studies to be a strong predictor of intentions and behavior as it is found to affect entrepreneurial intentions positively (Schlaegel and Koenig, 2014; McGee et al, 2009**;** Barbosa et al., 2007; Zhao et al., 2005; and Kickul et al, 2009). Based on the above discussion, the first research question and hypothesis are as follows:

"RQ1: What is the impact of entrepreneurial self-efficacy on entrepreneurial intentions?"

Hypothesis 1*: Entrepreneurial Self-efficacy positively correlates to entrepreneurial intentions.*

2.3 The Role of Cognitive Style in Influencing Entrepreneurial Self-Efficacy (ESE) and Subsequent Intentions

Cognitive style is believed to play an important role in influencing individual's entrepreneurial self-efficacy in the road to entrepreneurial intentions (Boyd and Vozikis, 1994; and Barbosa et al, 2008). More specifically, when individuals start to consider entrepreneurship as a viable career option, their cognitive styles may play

an important role in influencing individuals' self-perceptions regarding various skills required to create a new venture by nurturing some perceptions and hindering others. Barbosa et al., (2007) studied the impact of cognitive style on entrepreneurial self-efficacy. It was proposed that intuitive individuals will score higher than analytical individuals on the tasks of self-efficacy that reflects the early phase of the entrepreneurial process which is opportunity identification efficacy. On the contrary, the former will score lower than the later on the task of self-efficacy that occurs in later phases of the entrepreneurial process, and they are relationship, managerial and tolerance efficacy. Opposing to what was proposed; the findings reported that there was no difference found between intuitives and analytics on opportunity identification efficacy. This is because maybe analytical individuals think they could recognize opportunities with their analytical skills rather than intuition and gut feelings. Moreover, it was found that intuitive individuals scored lower than analytical individuals on relationship, managerial and tolerance efficacy. The previous findings are partially consistent with Olson's, (1985) notion that both intuitive and analytical thinking styles are most effective in different phases of the entrepreneurial process.

In a consistent manner, Kickul et al, (2009) examined the role of an individual's cognitive style in influencing their perceived entrepreneurial self-efficacy according to the specific phases of the entrepreneurial process that is often labeled as new venture creation process. The findings showed that an individual's intuitive cognitive style enhances his/her self-efficacy in the opportunity identification process as individuals possessing an intuitive cognitive style had higher confidence in their capabilities to identify and exploit new opportunities, whereas, they didn't have much confidence when it comes to evaluating those opportunities, marshaling resources and implementation. On the other hand, it was found that an individual's analytical cognitive style enhances his/her self-efficacy in planning, marshaling resources and implementation to create their new venture as individuals possessing an analytical cognitive style were found to have higher confidence in their competencies to evaluate opportunities, plan, marshal resources and implementation, whereas, when it comes to identifying new opportunities, they don't have much confidence in their skills (Kickul et al, 2009). Moreover, Vance et al, (2012) conducted an empirical study to test the correlation between thinking style balance and entrepreneurial self-efficacy. The findings reported that thinking style balance is significantly associated with all dimensions of entrepreneurial self-efficacy as all measures of efficacy were found to be significantly influenced by thinking style balance. Therefore, both constructs are believed to be important cognitions that highly contribute to entrepreneurial intentions and success. The past findings suggest that both analytics and intuitives may acquire different skills through their mastery experiences which will subsequently improve different types of self-efficacy that will eventually affect their intentions differently. Based on the above discussion, the second and third research questions and hypotheses are as follows:

"RQ2: What is the impact of cognitive style on entrepreneurial self-efficacy?"

> ***Hypothesis 2A:*** *Linear thinking style will positively correlate with entrepreneurial self- efficacy.*
>
> ***Hypothesis 2B:*** *Non-linear thinking style will negatively correlate with entrepreneurial self-efficacy.*
>
> ***Hypothesis 2C:*** *Balanced thinking style will positively correlate with entrepreneurial self-efficacy which exceeds the magnitude of the relationship predicted in H1.*

"RQ3: How would cognitive styles affect the entrepreneurial self-efficacy-entrepreneurial intentions relationship?"

> ***Hypothesis 3:*** *There will be a stronger and higher significant relationship between entrepreneurial self-efficacy and entrepreneurial intentions for individuals with balanced thinking style than for those with linear and non-linear styles.*

3. Methodology

3.1 Research Design and Sample

A total of 906 surveys were distributed of which 864 surveys were complete and usable. The survey was distributed to graduates from three private universities in Egypt: German University in Cairo (GUC), British University in Egypt (BUE) and Nile University (NU). The age of the target sample ranges from 20 to 26 years old. Regarding the gender distribution of the sample, males represent 30% of the sample and 70% of the sample were females. Moreover, 42.7% of the sample was unemployed as they were fresh graduates, whereas 32.8% of the sample was employed in salaried work. Furthermore, the sampling technique adopted was non-probability judgmental sampling which is a form of convenience sampling where the researcher selects a certain sample of the population based on who he/she thinks would be appropriate for the study (Malhotra,

2010). Finally, the questionnaire was distributed by integrating both online and offline data collection techniques within the time frame of June 2018 till the end of June 2019. It is worth mentioning that participants were informed that participation in the study is entirely voluntary, and confidentiality was guaranteed.

3.2 Measures

The scale adopted to measure cognitive style was Linear Nonlinear Thinking Style Profile (LNTSP) developed by Vance et al, (2007). It is a 26-item, four-dimensional, forced-choice self-report measure of decision- making style; 13 items measuring linear thinking style dimension while the other 13 items assess the nonlinear thinking style dimension. Whereas the thinking style balance score is calculated as the difference between total linear and total nonlinear scores (Ettlie et al, 2014). It is worth mentioning that there is an alternative approach to measure thinking style construct. For multiple groups comparison analysis, further classification/categorization of thinking style was made; the researcher created three groups (linear, nonlinear, and balanced) based on the spread of the difference scores (linear – nonlinear) (Ettlie et al, 2014). In this study, three groups were created, and they are categorized as follows: nonlinear thinking (difference score ≤ -1), balanced thinking (difference score= 0 through 9) and linear thinking (difference score ≥10).

While the scale adopted to measure entrepreneurial self-efficacy was the Entrepreneurial Self-Efficacy (ESE) Scale developed by McGee, Peterson, Mueller, Sequeira, (2009). It is a 19-item, five-dimensional self-report measure of entrepreneurial self-efficacy. Respondents were asked to voluntarily indicate on a 5-point Likert scale (1 = very little, 5 = very much) how much confidence they had in their ability to engage in each of the 19 entrepreneurial tasks. Furthermore, entrepreneurial intention scale was adopted from the Entrepreneurial Intention Questionnaire (EIQ) developed by Linan and Chen, (2009). It is a six-item, one factor, general pure intention measure built on Likert type scale assessing the degree to which individuals have seriously considered to become entrepreneurs. Respondents were asked to voluntarily read the statements and indicate on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree) their level of agreement or disagreement.

4. Results

Before conducting the data analysis, confirmatory factor analysis (CFA) for LNTSP, ESE and EI scales were carried out to measure the validity of the scales. According to table 1, the goodness of fit indices shows acceptable and satisfactory validity of the three scales. The CHI standardized is within the acceptable baseline. Moreover, all values of the six indices; Goodness of Fit Index, Normed Fit Index, Relative Fit Index, Incremental Fit Indexes, Tucker-Lewis Index, Comparative Fit Index are greater than 0.90, thus within the acceptable baseline as well. Additionally, the values of Root Mean Square Residual and Root Mean Square Residual Error Approximation are below 0.08 which is acceptable and indicates a very good fit of the three models (Hair et al., 2014).

Table 1: The Goodness of Fit Indices for Research Variables

	CMIN/DF	GFI	NFI	RFI	IFI	TLI	CFI	RMR	RMSEA
Required threshold	(2-5)	>.90	>.90	>.90	>.90	>.90	>.90	<.08	<.08
LNTSP Scale	2.271	0.975	0.930	0.916	0.960	0.951	0.959	0.020	0.038
Entrepreneurial Self-Efficacy Scale	4.136	0.960	0.944	0.923	0.957	0.940	0.956	0.065	0.06
Entrepreneurial Intentions Scale	3.326	0.994	0.996	0.989	0.997	0.992	0.997	0.009	0.052

Additionally, as shown in table 2 all research variables have shown acceptable and satisfactory reliability scores as Cronbach's alpha scores were (> 0.7) (Pallant, 2007). According to the below table the Cronbach's alpha scores of the Linear thinking style, Non-Linear thinking style, searching efficacy, planning efficacy, marshaling

efficacy, implementing efficacy and entrepreneurial intentions were as follows α = 0.796, α = 0.796, α = 0.707, α = 0.720, α = 0.778, α = 0.898 and α = 0.936 respectively. Another method was applied to test the reliability of the scale using Structure Equation Modeling (SEM) which is the Composite Reliability (CR). Composite reliability is intended to measure the internal consistency of the scale as well. The Composite Reliability scores of the scales have reported satisfactory and acceptable values (> 0.7) (Hair et al., 2014).

Table 2: Reliability for Research Variables

Dimension	Reliability Coefficient α	Composite reliability (CR)
Linear (Analytical) Thinking style	.796	0.870
Non-Linear (Intuitive) Thinking style	.796	0.870
Searching efficacy	.707	0.727
Planning efficacy	.720	0.739
Marshaling efficacy	.778	0.782
Implementing efficacy	.898	0.867
Entrepreneurial Intention	.936	0.898

As shown in table 3, the results show that there is a significant correlation between linear, non-linear and balanced thinking style and entrepreneurial self-efficacy at a significant level (P<0.01). It was shown that linear and balanced thinking style are positively correlated with entrepreneurial self-efficacy (r=0.121, 0.127) respectively. Yet, the magnitude of the Balance-ESE relationship is higher compared to Linear-ESE relationship. While non-linear thinking style was negatively correlated with entrepreneurial self-efficacy (r= -0.121). Thus, the previous findings provide support for Hypotheses 2, 3 and 4.

Table 3: Correlation between cognitive style and entrepreneurial self-efficacy

Correlations					
		self-efficacy	Linear (Analytical)	Non-Linear (Intuitive)	Balanced
self-efficacy	**Pearson Correlation**	1	.121**	-.121-**	.127**
	Sig. (2-tailed)		.000	.000	.000
Linear (Analytical)	**Pearson Correlation**		1	-1.000-**	.992**
	Sig. (2-tailed)			0.000	0.000
Non-Linear (Intuitive)	**Pearson Correlation**			1	-.992-**
	Sig. (2-tailed)				0.000
Balanced	**Pearson Correlation**				1
	Sig. (2-tailed)				
**. Correlation is significant at the 0.01 level (2-tailed).					

As shown in table 4, the results show that there is a significant positive correlation between entrepreneurial self-efficacy and entrepreneurial intention (p-value=.000, r=0.424). Thus hypothesis 1 is supported.

Table 4: Correlation between entrepreneurial self-efficacy and entrepreneurial intention

		Self-Efficacy	Entrepreneurial Intention
Self-Efficacy	**Pearson Correlation**	1	.424**
	Sig. (2-tailed)		.000
Entrepreneurial Intention	**Pearson Correlation**		1
	Sig. (2-tailed)		

Structural Equation Model Results for the Non-linear, Balanced and Linear Groups

Multiple group comparison analysis which is commonly applied in experimental research was conducted using structure equation modeling (SEM) to compare between the three thinking style groups, non-linear, balanced, and linear groups on the relationship between entrepreneurial self-efficacy and entrepreneurial intentions. Before presenting the multiple group analysis results, the goodness of fit indices of the model will be presented. The results of the model fit show that the model is acceptable and satisfactory in terms of overall goodness of fit measures. The CHI standardized is 2.078 which is within the acceptable baseline. Moreover, all six values of Goodness of Fit Index, Incremental Fit Indexes, Normed Fit Index, Relative Fit Index, Tucker-Lewis Index and Comparative Fit Index are greater than 0.95, thus all values are considered exceptional which indicates that the model is highly fit. Furthermore, the values of Root Mean Square Residual and Root Mean Square Residual Error Approximation are below 0.05 which are exceptional values as well and indicate an excellent fit of the model (Hair et al., 2014).

Table 5: Measuring the Goodness of Fit of the Model

	CMIN/DF	GFI	NFI	RFI	IFI	TLI	CFI	RMR	RMSEA
Required threshold	(2-5)	>.90	>.90	>.90	>.90	>.90	>.90	<.08	<.08
Model	2.078	0.993	0.988	0.976	0.994	0.987	0.994	0.015	0.035

According to table 6, the results showed that even though, the relationship between entrepreneurial self-efficacy and entrepreneurial intentions was significant across the three thinking style groups, the relationship was stronger in effect (beta=0.2>0.171, 0.161) and had higher significance (0.003>0.03, 0.047) for graduates with balanced thinking style than for those with linear and non-linear thinking style. Therefore, the previous findings provide support for hypothesis 5.

Table 6: The Regression Path Coefficient and the Standardized Path Coefficient between constructs in the model for linear, non-linear and balanced cognitive style groups

Dependent	Path	Independent	Non-Linear (Intuitive)		Balanced		Linear (Analytical)	
			Standardized Estimate	P-value	Standardized Estimate	P-value	Standardized Estimate	P-value
Implementing	<---	self-efficacy	0.154		0.396		0.273	
Marshaling	<---		0.536	0.026*	0.421	***	0.508	***
Planning	<---		0.679	0.024*	0.649	***	0.603	***
Searching	<---		0.719	0.024*	0.549	***	0.62	***
Entrepreneurial Intention	<---	self-efficacy	0.161	0.047*	0.2	0.003**	0.171	0.03*
*p < 0.05, **p < 0.01, ***p < 0.001								

5. Discussion

This study's findings were consistent with the literature review as the results indicate that the higher the analytical cognitive style, the higher the confidence level in performing the overall entrepreneurial tasks and thus the higher the entrepreneurial intentions. While the higher the intuitive style, the lower the confidence level in performing the overall entrepreneurial tasks and thus the lower the entrepreneurial intentions. Furthermore, the results reported that the higher the balance cognitive style, the higher the confidence level in performing the overall entrepreneurial tasks and thus the higher the entrepreneurial intentions. Yet, the magnitude of the Balance-ESE relationship is higher compared to Linear-ESE relationship.

One of the main objectives of this study is to assess how differences in cognitive style would impact the relationship between entrepreneurial self-efficacy and entrepreneurial intentions. The empirical results of the multiple group comparison supported the role of thinking style balance in influencing entrepreneurial behavior since the relationship between entrepreneurial self-efficacy and entrepreneurial intentions was stronger in

effect and had higher significance for graduates with balanced thinking style than for those with linear and non-linear thinking styles. This indicates that individuals with balanced thinking style would have higher chances of starting up their own businesses as they would have higher self-confidence in their abilities and thus higher entrepreneurial intentions compared to those with linear and non-linear thinking styles. The previous findings are somehow consistent with the literature as Ettlie, (2014) found that thinking style balance is more associated with innovative intentions and behavior than would non-linear and linear styles. Therefore, this research supports the claim in the literature that the more the individuals are capable of achieving a greater versatility in employing either linear or non-linear thinking, the more they are capable of developing entrepreneurial competences and thus demonstrating higher entrepreneurial behavior. This is because thinking style balance is a key component throughout the entrepreneurial process, thus it predicts successful innovative outcomes and capabilities (Ettlie et al, 2014).

6. Practical Implications

This research has important implications for *educators and program designers.* There is a widespread criticism in the literature that business education overemphasizes the linear thinking style, although the nonlinear thinking style is as important as the linear style in entrepreneurship and business education. Therefore, Entrepreneurship and business educators in universities should strive to develop a curriculum that endorse versatility by developing students' intuitive and rational thinking and design an evaluation system that recognizes both styles as well. Moreover, this research has valuable implications for *entrepreneurs* as well. One important implication of this research is to raise awareness and help entrepreneurs understand their own cognitive styles, allowing them to identify their dominant and auxiliary styles so that they could seek expert assistance through self-development training to further strengthen and develop their auxiliary styles to be able to enhance their thinking style versatility which would result in better innovative behavior. Finally, this research could be valuable to *venture capitalists and financial/investment institutions.* This research emphasizes balanced thinking style as an important criterion for identifying, screening and nurturing future entrepreneurs as it would give venture capitalist and financial/investment institutions valuable insights on the entrepreneurs' capabilities to outperform the entrepreneurial tasks in creating and managing businesses successfully.

7. Conclusion

This study supports the important role of cognitive style in affecting the road to entrepreneurial intentions as it was found that differences in individual's cognitive style would affect their self-perceptions towards entrepreneurial self-efficacy which subsequently affect their entrepreneurial intentions. The findings of this study pinpoint the significance of the new notion of balanced thinking style by verifying its positive role in stimulating entrepreneurial behavior and intentions. In conclusion, this research provides a better understanding of how differences in individuals' cognitive styles affect their paths to entrepreneurial intent, hence having a clearer picture of the process that leads to entrepreneurial intentions.

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