

ANALYSIS OF THE MEDIATING ROLE OF COGNITIVE ABILITIES/ COGNITIVE STYLE IN DECISION MAKING OF THE ENTREPRENEURS WHILE APPLYING EFFECTUATION PRINCIPLES

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Abstract - One of the main concerns of researchers and educators, particularly in the entrepreneurship domain, has been identifying the mechanism through which cognitive abilities and cognitive style affect the behavior of entrepreneurs. This is because of the crucial role that entrepreneurial decision-making personnel play in inspiring and enabling people to establish for new venture. This research investigates the connection of Cognitive Abilities/ Cognitive Style with Decision Making of the Entrepreneurs while applying Effectuation Principles. The sample was composed of 1,112 entrepreneurs involved in entrepreneurial activities or running businesses from Pakistan, Sindh both urban and rural areas of Sindh Province, operating in different industries or doing home based business in small or medium size enterprises. Cognitive abilities' mediating impact on effectuation principles and decision making of entrepreneurs is analyzed through simple regression and multiple regression with the help Baron and Kenny four step model. Furthermore, cognitive abilities mediate the relationship between entrepreneurial decision making and effectuation principles. Findings of the current study suggested that cognitive abilities are the strongest predictor of effectuation principles followed by entrepreneurs in their decision making.

Keywords: Cognitive abilities/ Cognitive Style, Entrepreneurial decision making, Effectuation Principles.

1. INTRODUCTION

The process of decision making is the main characteristics of the entrepreneurs. The process of decision making is related to the identification of the new opportunities in the market along with new ideas, procedures, methods, products, and services (Rizvi, et al., 2018), and is the main reason that differentiate the entrepreneurs from each other. A characteristic feature of the decision-making procedure is vulnerability most commonly called danger, which is mainly the result of curiosity of circumstances (Sarasvathy, et.al., 2003). In a situation where, vulnerability changes are under consideration, entrepreneurs use cognitive abilities to solve such problem, and it is possible through entrepreneurial rationale that many experts use to focus on revealing the methodology used, which ultimately plans to lead towards the progress. The causation and effectuation are the two most important innovative methods in the process of decision making or the establishment of the logics. Causation is portrayed as the primary leadership process, which depends on the organization and research related to inert marketing research along with the organized technique approximation (Sarasvathy, et al., 2014). Effectuation is a progressive approach that is based on the goals and methodology of the investigation, and in today's world guiding many businesses. First time introduced in award winning research paper by Sarasvathy in 2001. It is interesting to note that the implementation procedure corresponded to more unpredictable situations (Abbas, et al., 2016). Instead of trying to make a nascent company seeming strong for future events with clear business agreements and prudent procedures, the emphasis is given on control methodologies that are dependent on adaptability, the use of each individual expense asset and the adoption of all ideal partnership obligations provided the chance of opening up new markets with fulfilment of objects (Sarasvathy, 2001 and 2008).



2. LITERATURE REVIEW

The entrepreneurial cognition is an emerging and thought-provoking field of research in behavioral sciences. The most distinguishing feature of this emerging field is the methods and concepts developed in cognitive sciences and are being utilized for asking different research questions in entrepreneurial literature. There has been work done on exploring the cognitive factors while start-ups of the business but little attention was paid to the way entrepreneurs make strategic decision after any crisis such as COVID-19 Pandemic. Pakistan has witnessed a stream of entrepreneurs at the local level (Qureshi, et al., 2016). Despite extensive research on entrepreneurship in general, less work has been done in Pakistan, especially with regard to the application of the effectuation model presented Sarasvathy (2001). Consequently, the study is perhaps the only one of its kind particularly with the reference of application of effectuation principles in decision making of the business owners. Whether the five core principles of effectuation model have any impact on cognitive abilities of entrepreneurs working in small and medium enterprises (SMEs) of Sindh, Pakistan. What impact on decision making of entrepreneurs working with new scenario? Therefore, this study intends to cover this gap in the empirical evidence in the context of the Pakistani entrepreneurs.

DECISION-MAKING LOGIC

Sarasvathy, (2008), proposed the effectuation logic in the decision-making process, defined as follows: "Causation processes take a particular effect as given and focus on selecting between means to create that effect. Effectuation processes take a set of means as given and focus on selecting between possible effects that can be created with that set of means". The author makes the implication that decision-makers' beliefs and conceptions regarding future phenomena informed about their reasoning. Decision-makers will frequently use causal reasoning if they believe that the future can be predicted; otherwise, they will frequently use the logic of exposure.

Sarasvathy, (2008), used cooking as an analogy. In the case of causation and effectuation relationships, food is selected and she tried to find the necessary ingredients and kitchen utensils, and then he prepares this particular food. However, in the case of the effect, the chef does not mean any specific food, but rather looks through the cabinets to see which ingredients and utensils are available, and then prepared food based on this option as one of several options (Saleem and Iqbal, 2016). These both logics are characterized by different principles.

COGNITIVE ABILITIES

Cognitive abilities referred to as a degree to which entrepreneurs become self-regulated, flexible, and dynamic and also get involved in developing as much as possible alternatives, in decision making process. Also, the ability to scan changes in the environment to turn it into opportunities and to act accordingly (Hisrich, et al., 2008). For better understanding it can be explained as the process of representation and transformation of the decision related information that is present in human cognitive system. Has it a direct impact on quality and accuracy of decision-making process? This is one of the major reasons so scholars pay attention to the importance of cognition in entrepreneurial decision making (Baron, 1998 Mitchell et al., 2002).

A few studies (Fisher, 2012, Karri and Goel, 2008, Perry, et al., 2012, Sarasvathy, 2008, Read, et al., 2005 and Sarasvathy 2001) showed that the most number of entrepreneurs are involved in the traditional entrepreneurial behaviour that is also considered to be the predictive behaviour during the process of their decision making. On the other side, the most of the entrepreneurs adopt the same model that is defined by Sarasvathy (2001) and named it as the five principles. Despite the fact that the portfolio entrepreneurs are more concerned for the application of effectuation in the very initial stages of establishing their business, then they switch to logic based on cause and effectuation relationships as each business develops (Hauser, et al., 2019). Not only maturity, but also growth leads to a decrease in efficiency (Anagnou, et al., 2019). Finally, a crazy blanket built of relationships and predestination leads to some dependence on the path, and experiments are replaced by planning (Kerr and Coviello, 2019). The cognitive approach provides the basis for better understanding of how an entrepreneur sees the opportunities, adopt skills and develop abilities to cope up with the environment. (Barbosa, et al., 2007). Another argument by (Keh et al., 2002; Busenitz, 1999; Busenitz and Barney, 1997) states that the use of cognitive biases and heuristics enables, even quick decision making.

2.1 PROBLEM STATEMENT

In this present-day competitive world, there is a noteworthy role of entrepreneurship, but still there is need to focus on the entrepreneurial cognition due to changing business environment to come up with better decision making in the business.

It is of great significance for businesses to reconsider their business models and conducting feasibility analysis to make better decisions accordingly (Donthu, et al., 2020). Therefore, the present study focusses on effectuation model proposed by Sarasvathy, (2001) in accordance with decision making of entrepreneurs while applying cognitive style of decision making.

2.2 RESEARCH OBJECTIVES

There is very pertinent role of effectuation for not only the establishment of a new business but also for the survival of the business in the competitive market. In this regard, the main purpose and aim of this study is, *“to evaluate the application of effectuation model for the entrepreneurship in the context of decision making”*. In addition to this, the sub-objectives of the study are to study role of cognitive style (Cognitive abilities CA) on decision making of entrepreneurs while applying effectuation principles.

1. To investigate the impact of Cognitive Abilities on Decision Making.
2. To investigate mediating impact of Cognitive Abilities (cognitive style) in the relationship between Effectuation Principles and Decision Making.

2.3 RESEARCH QUESTIONS

On the basis of the research objectives, this study intends to answer the following research questions:

1. Does presence of Cognitive Abilities/ cognitive style as a (mediator) increases/decreases Effectuation Principles' significance over Decision Making ?
2. Does Cognitive Abilities/ cognitive style have mediating impact on Decision Making of the entrepreneurs?

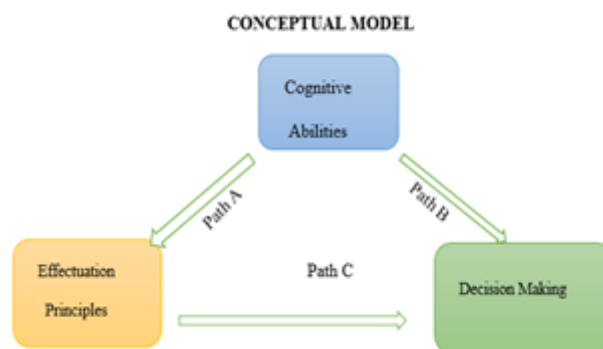
2.4 RESEARCH HYPOTHESES

After going through vast literature, development of research objectives and research questions, the set-up hypotheses of the study are mentioned below:

H1: CA will significantly predict the variance in DM in entrepreneurs working in SMEs.

H2: CA will significantly mediate the variance between EF and DM among in entrepreneurs.

2.5 RESEARCH MODEL



This model suggests that:

1. Effectuation principles have direct impact on decision making of entrepreneurs working in SMEs of Sindh Pakistan.
2. Cognitive abilities have direct impact on selecting Effectuation principles followed by entrepreneurs.
3. There is association between cognitive abilities and decision making.
4. Cognitive abilities have mediating impact on effectuation principles and decision making of entrepreneurs to run their business with dynamic conditions, and ever-changing consumer behaviour.

2.6 SIGNIFICANCE OF RESEARCH

The study applies the Sarasvathy model (2001), to Pakistani entrepreneurs to test its relevance in Pakistani conditions. As the world is changing especially the way businesses carried their operations. Therefore, entrepreneurs have to come up with new strategic decisions and practice to survive. Which ultimately requires cognitive abilities to make different decisions than ever before. In this regard, this study is useful for the entrepreneurs and entities to understand role of Effectuation model and Cognitive Abilities in Decision Making.

Current research makes a fundamental contribution to the information body and, thus, can demonstrate incredible value for the academicians, scholars and practitioners to deepen their understanding of effectuation principles with regards to decision making and mediating role of cognitive abilities.

3. METHODOLOGY

Primary data was gathered from the respondents which were entrepreneurs who were responsible for decision making of their business. Current study employs a deductive research technique. Also, the researcher is impartial with regard to the study's findings and has no influence on the respondents; they may reject or accept assumptions and hypotheses. This study conducted a survey with the help of adopted questionnaire for data collection using a cross-sectional data collection strategy. The population of the study consist of entrepreneurs being involved in entrepreneurial activities or running businesses from Sindh both urban and rural areas, operating in different industries or doing home based business in small or medium size enterprises.

Districts		No of entrepreneurs	Total Population (2017)
Urban Areas	Rural Areas		
Karachi	-	492	2,972,639
Hyderabad	Jamshoro Matiari Tando Allahyar	297	2,201,079
Sukkur	Khairpur Mirs city KotDiji (KotBanglow) Ranipur	223	1,487,903
Total sample size		1012	

3.1 NATURE OF RESPONDENTS

All entrepreneurs owning or running their business and were responsible for decision making of his or her business working in small and medium size enterprises.

- Food chain
- Fast moving consumer goods
- Household business (such as; live stocks, handicraft, pottery, dairy products, beauty parlors, boutiques)
- Retailers (Such as; Retail chain owners)
- Grain markets
- Brokers
- Agri-entrepreneurs (such as; Landlords, wildlife conservation, innovative agri-processing)
- Freelancers

3.2 RESEARCH INSTRUMENT

In this study decision-making (preferably cognitive style of decision making) variable is measured through the questionnaire that is adopted from the research of (Sadler-Smith et al., 2000) the researcher confirmed its reliability and validity by reporting its concurrent validity, construct validity and the factor analysis. This has 37 questions based on Likert scale.

The effectuation (means based on, affordable loss, strategic alliances, embrace contingencies and creation of future plan) that is measured by using the questionnaire of (Chandler et al., 2011) that is based on 25 items in seven scale Likert Scaling Style.

Gender	Frequency	Percent	Valid Percent	Cumulative Percent
Male	714	70.4	70.4	70.4
Female	298	29.4	29.4	29.4
Total	1013	100.0	100.0	

4. FINDINGS OF THE STUDY

4.1 DATA ANALYSIS

The analysis of mediating role of cognitive abilities between effectuation principles and entrepreneurial decision making is the purpose of this study. The data obtained from the target population through the questionnaire has been tabulated and analyzed as follows:

Place	Frequency	Percent	Valid Percent	Cumulative Percent
Karachi	492	48.5	48.5	48.5
Hyderabad	297	29.3	29.3	29.3
Sukkur	223	22.0	22.0	22.0
Total	1013	100.0	100.0	

4.2 DEMOGRAPHICS

Age Group	Frequency	Percent	Valid Percent	Cumulative Percent
15-30 years	359	35.4	35.4	35.4
31-45 years	313	30.8	30.8	30.8
46 -60 years	274	27	27	27
61 years and above	66	6.5	6.5	6.5
	1013	100.0	100.0	

There were three demographics included in the study. The target audience was male and female entrepreneurs working in Sindh. Their summary has been presented in the following tables:

Maximum entrepreneurs among our sample size belonged to 15-30 years of age group. More than half of the entrepreneurs among the targeted sample population were males and most of the entrepreneurs who participated in the survey worked in Karachi city.

4.3 RELIABILITY ANALYSIS

To find out the internal reliability among the variables, the Cronbach's alpha analysis is used. The reliability coefficient Alpha usually ranges between 0 and 1, according to (Gliem & Gilem, 2003). The rule of thumb specified by George and Mallery (2003) for interpreting Cronbach's alpha is acceptable that is above 0.80. The acceptable values range for Cronbach's alpha-ca is 0.71-0.9; below this value the internal consistency of the

common range is low. The table shows that the Cronbach’s alphas of all scales are high for the current samples when compared with the threshold values. Therefore, the present scale Cronbach’s alpha of emotional exhaustion ($\alpha = .885$), indicates good internal reliability. Thus, the reliability analysis of the current research suggests the internal consistency of the questionnaire. The reliability calculations are presented in the following table:

Variable	Cronbach Alpha
Cognitive Ability	.834
Decision Making	.851
Effectuation Principles	.885

4.5 CORRELATION ANALYSIS

To identify levels of significance between factors correlation analysis is done. Pearson’s coefficient of correlation discovered elevated levels of considerable positive correlations for all proportions. The total scores of relationships of these dimensions were calculated as suggested by Overbeek, Scholte, de Kemp, & Engels (2007), and found to be .365 to .646, suggest convergent validity of the questionnaire as given in the following table.

Correlation analysis has been employed to explore the linear relationship between the variables. The potency of correlation is calculated by complete assessment of correlation coefficient which may fall between -1 and +1. Findings of the correlation values reveal significant positive correlation. Correlation $r = 0$ indicates that there is no linear relationship between the variables. The direction of the relationship is indicated by the sign of coefficient.

Variables	1	2	3	4
Cognitive Ability	1			
Decision Making	.365**	1		
Effectuation Principles	.476**	.646**	1	
N=1013, **p<0.01.				

4.5 MEDIATION ANALYSIS

The connection between reliant and associated factors that is stored in a data file is discovered in the course of mediation analysis. The reason of a change in the value of an interdependent variable can affect the dependent data is also explained by it. The main requirement of mediation analysis is to recognize the nature of relationship among associated variables.

The major test statistics and their p-values in this study are used to assess the importance of direct path impact. In order to assess the importance of variables, the bootstrapping method is applied on 1013 data samples. The study’s findings showed that more extracted variable values were significant than expected, exceeding the rule of thumb for p-values and test statistics. Findings showed that when cognitive capacities increase, decision-making likewise does, which is in line with our theory i.e.

H1: Cognitive Abilities will significantly predict the variance in Decision Making in entrepreneurs working in SMEs.

H2: Cognitive Abilities will significantly mediate the variance between Effectuation Principles and Decision Making among entrepreneurs.

The mediation of cognitive abilities is shown to be partial mediation as the beta value decreased in terms of both effectuation principles and decision making.



Mediation estimates of cognitive abilities and effectuation principles is 0.561, which specify the positive relation between both variables, p values less than 0.05 shows the significance of relationship. This shows the acceptance of the hypothesis.

The effectuation principles and decision making are positively associated with cognitive abilities and estimated value shows low levels of cognitive abilities can diminish decision making in entrepreneurs. P value indicates the significance of relationship and acceptance of our hypotheses as:

Hypothesis	Statements	Results
H1	Cognitive Abilities will significantly predict the variance in Decision Making in entrepreneurs working in SMEs.	Supported
H2	Cognitive Abilities will significantly mediate the variance between Effectuation Principles and Decision Making among entrepreneurs.	Supported

	B	SE	T	p
Cognitive Ability → Decision Making	.463	.077	6.026	.000
Cognitive Ability → Effectuation Principles	.518	.067	7.784	.000
Effectuation Principles → Decision Making	.666	.066	10.131	.000
Cognitive Ability → Effectuation Principles → Decision Making	.118	.072	1.651	.001
Bootstrap result for indirect effect	Indirect Effect .345	LL 95% CI .248	UL 95% CI .453	

5. DISCUSSION

With effectuation principles and the mediating impact of cognitive abilities between the variables, this study aimed to investigate the relationship between cognitive abilities and entrepreneurial decision making. It was based on a structural path effectuation model proposed by Sarasvathy (2001) in accordance with the decision-making of entrepreneurs in the SMEs of Sindh. Using effectuation principles and their application to entrepreneurial decision making our findings offered empirical support for the hypothesized link between cognitive ability and entrepreneurial decision making. More precisely, this study demonstrated that domain-specific cognitive skills among nascent entrepreneurs have the most favorable influence on decision-making in the entrepreneurial field (Zhao et al. 2005; Culbertson et al. 2011; BarNir et al. 2011; Fayolle et al. 2006). This result confirms that entrepreneurs' ability to make decisions is significantly influenced by their cognitive talents, accordance with effectuation principles (Mensah, Asamoah, & Jafari-Sadeghi, 2021). Hence, by increasing their desire to pick starting their own enterprises as their career path objective and empowering people to tackle the inherent hurdles of a new venture development process, entrepreneurial decision making may be improved. Additionally, due to its strong direct and indirect linkages with the concept, effectuation principles emerged as the most substantial contributor to decision making among entrepreneurs. This emphasizes effectuation principles as the most effective component enhancing their capacity for entrepreneurial decision-making. (Culbertson et al. 2011; Chen et al. 1998; Bandura 2012; Souitaris et al. 2007; Wilson et al. 2007; Zhao et al. 2005; Fayolle et al. 2006).

The link between entrepreneurial decision making and effectuation principles is partially mediated by cognitive capacities, according to analysis of the route structure between the constructs under inquiry. Hence, in order to gain a better understanding of entrepreneurial decision making, researchers may

need to incorporate these dimensions in their studies (Bryant 2009, 2007). They may use the framework provided by the model that emerges from this research to apply it to ideas on entrepreneurial behavior, including theories on entrepreneurial cognitive talents. Our study's conclusions also have a number of ramifications for entrepreneurship educators. Secondly, given the significant influence that cognitive abilities have on how entrepreneurs make decisions, students should get more focused and effective entrepreneurship training and education to increase their effectiveness in carrying out certain activities and duties as entrepreneurs. To achieve this, educators, trainers, or mentors can provide nascent entrepreneurs with a variety of learning opportunities, including case studies, role modelling, and developing business plans (Wilson et al. 2007; Fayolle et al. 2006). However, rather than focusing just on entrepreneurship ideas and conventional ways of teaching entrepreneurship, entrepreneurship education may provide students with a tough but supportive environment in which to operate a tiny new firm. (Fuchs et al. 2008; Fayolle and Gailly 2008; Trevelyan 2011; Zhao et al. 2005; Pittaway and Cope 2007). Because of this, entrepreneurship educators must be well-trained and skilled in the creation and implementation of various pedagogical strategies to enhance cognitive abilities and, as a result, the ability of young entrepreneurs to make entrepreneurial decisions.

6. CONCLUSION

According to the findings of the study, the best predictor of entrepreneurial decision-making is having excellent cognitive abilities. Additionally, the capacity of an entrepreneur to make decisions is significantly influenced by effectuation principles. Hence, in an effort to enhance students' entrepreneurial cognitive abilities and decision-making, this model may be employed by both entrepreneurship scholars and educators. The model also offers a clearer understanding of the way in which effectuation principles influence an entrepreneur's decisions. Future studies should investigate additional postulated processes by which cognitive skills affect entrepreneurial decision-making, such as result expectancies (social, physical, and self-evaluation) and sociostructural variables (facilitators and obstacles). If the model developed from this study can be used to describe entrepreneurial activity in other regions of Pakistan, it can be further investigated. In order to paint a fuller picture of the mediating effect among the suggested factors, the model may also be evaluated to see if education, gender, and age have an impact on the relationship between cognitive skills and entrepreneurial decision-making using effectuation principles.

7. LIMITATIONS AND FUTURE RESEARCH

Notwithstanding our conclusions, there are several limitations to this study. First off, because we focused only on a sample of Sindhi entrepreneurs, our findings could vary depending on the situation. So, it could be wise to do a cross-country analysis or to conduct this research in several regions of the nation (Barnard et al., 2019). Second, this study used a methodology based on surveys. So, our replies represent the self-reported opinions of business owners. In light of this, it is advise to the future researchers to employ qualitative approaches to learn more about what can trigger the interaction between the two types (i.e. external factors). The suggested model might be improved by introducing a performance variable. Such an update may offer specific information on profitable companies. Future researchers may find it interesting to repeat similar studies while taking gender differentiation into account as a potential contributing factor. In the past, researchers have found gender-related differences in decision-making behaviour (Caputo et al., 2016; Buchan and Croson, 2004; Henrich et al., 2001). However, it is still unclear whether gender variation affects decision-making behavior, and this study aims to fill this knowledge gap.

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Effectuation Variables and Item Numbers:

Variables	Item Numbers
Means Based	9, 18, 21
Affordable Loss	14, 16
Alliances	11, 24
Embrace Contingencies	4, 7, 8, 10
Creation of Future	13, 15