8-2021

Before Turning into Ashes: A Study of Entrepreneurial Cognition, Learning, and Exit

Azadeh Zamanian
The University of Texas Rio Grande Valley

BEFORE TURNING INTO ASHES: A STUDY OF ENTREPRENEURIAL COGNITION, LEARNING, AND EXIT

A Dissertation

by

AZADEH ZAMANIAN

Submitted to the Graduate College of
The University of Texas Rio Grande Valley
In partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

August 2021

Major Subject: Business Administration

BEFORE TURNING INTO ASHES: A STUDY OF ENTREPRENEURIAL COGNITION, LEARNING, AND EXIT

A Dissertation
by
AZADEH ZAMANIAN

COMMITTEE MEMBERS

Dr. Jorge Gonzalez
Chair of Committee

Dr. Sibin Wu
Committee Member

Dr. Wanrong Hou
Committee Member

Dr. Michael Minor
Committee Member

August 2021

ABSTRACT

Zamanian, Azadeh, Before Turning into Ashes: A Study of Entrepreneurial Cognition, Learning, and Exit. Doctor of Philosophy (PhD), August, 2021, 211 pp., 24 tables, 21 figures, references, 423 titles.

Entrepreneurial practices such as discovery, evaluation, and exploitation of opportunities, decision-making, and problem solving are influenced by mental processes and cognitive mechanisms. Decision-making studies in the field of entrepreneurship confirm that entrepreneurs have strong tendency to use cognitive mechanisms such as biases and heuristics to simplify their decision-making processes and compared to non-entrepreneurs, entrepreneurs show higher levels of such biases.

By focusing on cognition of entrepreneurs, this study answers the question of why some individuals insist on continuing their entrepreneurial journey while failure-related phenomena such as critical setbacks and counterfactual thoughts exist.

Unlike the prior research that have focused on the antecedents of failure and learning outcomes of failure, the current research takes a different approach and studies failure and learning as entrepreneurial journeys rather than simply considering them as incidents or outcomes of a new venture. Therefore, instead of studying ventures that are rising from the ashes, the author investigates the behavior of entrepreneurs before their ventures turn into ashes.

DEDICATION

The completion of my doctoral studies would not have been possible without the love and support of my family. My husband, Mohammad Azarbayejani, my beautiful daughter, Audrey, my mother, Madis Fattahi, my father, Ahmad Zamanian, and my siblings, Yahi and Alireza, wholeheartedly inspired, motivated and supported me by all means to accomplish this degree. Thank you for your love and patience.

ACKNOWLEDGMENTS

I will always be grateful to Dr. Jorge Gonzalez, chair of my dissertation committee, for all his mentoring and advice. From research design, and data processing, to manuscript editing, he encouraged me to complete this process through his infinite patience and guidance. My thanks go to my dissertation committee members: Dr. Sibin Wu, Dr. Wanrong Hou, and Dr. Michael Minor. Their advice, input, and comments on my dissertation helped to ensure the quality of my intellectual work. I would also like to acknowledge the many volunteers who participated in my study.

TABLE OF CONTENTS

LIST OF TABLES

Page

LIST OF FIGURES

Page

CHAPTER I

INTRODUCTION

Entrepreneurship emerges from the actions of particular individuals who have passionately chosen to pursue opportunities that they have identified (Baron, 2004; Shane, Locke, & Collins, 2003). Although the value and importance of entrepreneurship to economic development, job creation, and innovation are well recognized in society (Carree & Thurik, 2010; Lee, Yamakawa, Peng, & Barney, 2011), the majority of entrepreneurial firms do not survive and more than half vanish within the first five years of being founded (Cooper, Woo, & Dunkelberg, 1989; Headd, 2003; Knott & Posen, 2005; Peng, Yamakawa, & Lee, 2010; Wiklund, Baker, & Shepherd, 2010).

The aforementioned reports regarding the failure rates of new ventures have encouraged entrepreneurship scholars to determine the underlying reasons of failure and to demonstrate what outcomes can be expected from failure experiences. A literature review in the field of entrepreneurial failure indicates that two main streams of research have evolved over time: *the study on antecedents of failure* and *the study of learning outcomes of failure*. The first stream, the study of antecedents of failure, has primarily focused on identifying and interpreting the reasons for failure (Bruno, McQuarrie, & Torgrimson, 1992; Zacharakis, Meyer, & DeCastro, 1999). The development of this field of study has gone hand in hand with the line of research which identifies the reasons for success and survival (Shane et al., 2003) since the lack of reasons to

succeed has exposed ventures to failure. The studies on antecedents of failure have overwhelmingly focused on "liabilities of newness" and ways of preventing failure. According to Stinchcombe (1965) new organizations carry four aspects that make them more prone to failure compared to established ones. First, new organizations can only take benefit of general knowledge until their members learn new, specific roles, and functions. Second, during the role identification and formation process, there may be conflict, worry, and inefficiency within new organizations. Third, relations with outside individuals and organizations must be forged, and an initial lack of trust may be a liability for new ventures. And finally, new organizations lack stable ties with the customers they wish to serve (Stinchcombe, 1965; Thornhill and Amit, 2003). These aspects which are referred to as liabilities of newness have been the focus of scholars in the field of entrepreneurship as the main reasons why ventures fail.

The second group of scholars who have conducted research with regard to learning outcomes of failure, argue that it is more important to investigate how learning occurs after different failure experiences, rather than indicating the reasons why new ventures fail (Stokes & Blackburn, 2002). The main reason for this argument is that failure experiences are inevitable, painful, and costly, but *functional* (Baker et al., 1997; Cardon et al., 2011) and can therefore provide individuals with post-failure learning opportunities (Cardon & McGrath, 1999; Minniti & Bygrave, 2001; Shepherd, 2003) and consequently enhance the entrepreneur's desire and ability to start over (Ucbasaran, Shepherd, Lockett, & Lyon, 2013; McGrath and Cardon, 1997). According to the view point about outcomes of failure experiences, failure is a source (Yamakawa, Peng, & Deeds, 2015) or precursor of success (Aldrich, 1999; Learned, 1999; McGrath, 1999). Failure experiences or any unpleasant outcomes can provide entrepreneurs with extensive feedback which in turn can result in higher accomplishments (Staw & Barsade, 1993).

Although these two streams of research, *the study on antecedents of failure* and *the study of learning outcomes of failure*, have clearly and comprehensively indicated antecedents and outcomes of failure experiences, neither of these viewpoints have emphasized on the fact that failure experiences do not occur overnight, and the education accompanying failure might not necessarily take place after failure experiences are complete. Here, I argue that failure and learning are gradual processes. Therefore, comprehending these phenomena requires a consideration of the whole process: *before*, *during*, and *after* the occurrence of failure. The main characteristic that differentiates my research from previously conducted research in the field of entrepreneurial failure is my extensive focus on the cognitive processes which are being stimulated in the mind of the entrepreneur and are likely to push the entrepreneur toward making exit decisions. Therefore, in this research, the focus is not on the occurrence of failure and the post-failure learning mechanisms. Instead, I investigate how individuals' cognitive mechanisms enhance learning and influence their decision-making while they engage in negative thinking or experience critical setbacks.

Up until 2001, the main body of entrepreneurial decision-making research was influenced by neoclassical micro-economic perspective. Scholars interpreted various individuals' actions and decisions based on these models, claiming that individuals are rational decision makers who conduct thorough research in order to make a decision. Therefore, precise and comprehensive information search to reduce risk forms the subsequent individuals' decisions and actions. According to this perspective, a decision to exit a business should be a result of comprehensive information search and analysis of the organization's ongoing external and internal events. In other words, if individuals are rational decision makers who tend to do thorough research before making a decision, their decision to exit the business should be rooted in rationality too. But,

does this happen in reality? March (1999) presented the idea that although performance enhancement is a result of rational decision-making, individuals are not always rational entities and they escape rational reasoning to make decisions by implementing "*technology of foolishness*". This perspective opposes rational reasoning and allows individuals to experiment or act unintelligently, irrationally and foolishly. Implementing the technology of foolishness can lead to more attractive consequences which are not achievable by pure rationality (March, 1999).

In 2001a, Sarasvathy expanded the idea on the technology of foolishness and introduced the concept of *effectuation* as a problem-solving style that contributes to individuals' decision-making. She further indicated that entrepreneurs do not follow the rational decision-making logic inherent in a neo-classical economic approach. According to effectuation, the future is unpredictable, therefore decisions cannot be made by gathering information. It follows that entrepreneurs try to control the future by making correct decisions in the moment rather than predicting the future based on information search. In the current research, I explain how effectuation influences the decisions of entrepreneurs to exit. Here, the decision to stay is not considered to be the opposite of the decision to exit. Since staying in the business is the long-term goal of those who start the business, however, the decision to exit can be a painful decision which entrepreneur may be required to make under difficult circumstances. Both of these approaches – effectuation and the traditional approach of neo-classical economic – are cognitive processes that make the entrepreneurs to adopt different behaviors. In one case, they may try to find investors for their ventures in the other case they may believe in utilizing their available resources for instance (Sarasvathy, 2001a). For instance, entrepreneurs with an effectual mindset may take riskier actions compared to less effectual entrepreneurs; or the effectual entrepreneurs may get less involved in collecting data regarding the decisions they are considering to make

while less effectual entrepreneurs may believe that there is extensive need to collect information before any decisions are made. Theory of effectuation is about different types of reasoning among entrepreneurs. This theory can be further tested by considering how effectuation level can influence the way individuals face exit decisions, learn from an incident, recover from it, and continue their entrepreneurial journey.

Effectuation as a type of reasoning and decision making can significantly influence entrepreneurial actions and behaviors. For this reason, scholars in the field of entrepreneurship research have investigated a variety of relationships that could exist between effectuation and other entrepreneurial activities. Scholars in this field have focused on opportunity discovery, identification, and exploitation processes (Sarasvathy, Dew, Velamuri, & Venkataraman, 2003), differences between entrepreneurs and non-entrepreneurs (e.g., Read, Song, & Smit, 2009; Sarasvathy, 1998; Sarasvathy, Simon, & Lave, 1998), and how performance can be improved (e.g., Brettel, Mauer, Engelen, & Küpper, 2012; Dew, Read, Sarasvathy, & Wiltbank., 2015; Read and Sarasvathy, 2005) through the lens of effectuation. All of these studies have neglected to investigate the impact of effectual logic on any failure-related phenomena, and there is a lack of empirical evidence to investigate the impact of this type of reasoning on an entrepreneur's decision to terminate the operations of a new venture and exit a business. Therefore, the first purpose of this study is to answer the following question:

Research question 1: "How does effectuation drive the entrepreneur's decision to exit the business?"

In addition to investigating the influence of effectuation on decisions to exit the business, this study also explores the impact of effectuation on the learning of the entrepreneurs while running their new ventures. Learning is crucial for gaining the knowledge needed to build and

upgrade a new venture's capabilities, thereby allowing it to sustain a competitive advantage (Huber, 1991; Zahra, 2012). As Minniti and Bygrave (2001, p.7) assert, "Entrepreneurship is a process of learning, and a theory of entrepreneurship requires a theory of learning." In order to elaborate the learning mechanism in my current study, first I briefly review how post-failure learning occurs. This review will help to interpret the learning process which is not an outcome of failure; rather it occurs gradually prior to failure, which, in this study, is the decision to exit the business.

Shepherd (2003) claims that failure experiences such as exit due to poor performance, are followed by grief recovery processes that provide the basis for learning from failure. He believes that, like other types of losses an individual may experience in life such as divorce and death, entrepreneurs feel intense grief when their businesses fail. This grief happens due to the strong emotional relationship that exists between the self-employed and his/her business. Entrepreneurs experience strong attachment to their ventures. Once their ventures are created, entrepreneurs strive so hard to see the growth and development of their ventures.

As stated by parenthood metaphor regarding new ventures, the emotions that entrepreneurs experience is comparable with the unconditional love of parents toward their children. Therefore, any failure experiences can be followed by feeling of grief. During the moments of grief, entrepreneurs are not necessarily capable of allocating resources and collecting or processing information to revise their existing knowledge of how to manage their own business. As a result, their ability to learn from failure diminishes (Bower, 1992). When the level of grief subsides over time and eventually neutralizes, entrepreneurs start to learn from their failure experiences. Roese (1997) refers to the concept of counterfactual thinking as the foundation of learning. He argues that unfavorable outcomes are followed by "*what might have*

been" thoughts which interpret the individuals' tendency to specify and evaluate the alternatives of a past event (Markman, Gavanski, Sherman, & McMullen, 1993; Roese, 1994). The reevaluation of what has occurred in the past and how different results could be achieved, had other choices been made, improves the cognitive ability of the individuals. It produces considerable impact on the individual's learning process through providing information that boosts individual's strength in analyzing the circumstances. Therefore, failure experiences help the entrepreneurs to obtain valuable information and to implement more qualified strategies to deal with future challenges (Epstude & Roese, 2008).

According to this argument, the combination of experiencing negative emotions, dealing with counterfactual thoughts and reevaluation of other possible outcomes builds the basis for learning. As stated by Arora et al. (2013), counterfactual thinking, by its nature, helps to improve learning. Individuals try to deconstruct the past to make sense of the present. This process, in return, prepares the individuals for future actions, and learning occurs.

Relying on these arguments, I propose the idea that failure-related learning happens not only after failure occurs, but also after any negative or regretful thoughts come into the mind of the entrepreneurs before failure actually takes place. Effectual logic can enhance the learning mechanism by giving the entrepreneurs the power to face new challenges and to hold a positive attitude toward negative incidents. Effectuation and counterfactual thinking can also help to discover more opportunities through enhancement of learning. Counterfactual thinking involves deconstructing and reconstructing scenarios which may result in the identification of unforeseen opportunities (Gaglio, 2004) and effectuation builds the ability to create new opportunities through learning by doing (Sarasvathy et al., 2003). Therefore, this study aims to address the following research questions:

Research question 2: “How does effectuation foster learning?”

Research question 3:” Can counterfactual thinking accelerate learning?”

It is important to note that all entrepreneurial practices such as discovery, evaluation, and exploitation of opportunities, decision-making, and problem solving are highly influenced by mental processes and cognitive mechanisms (Sternberg, 1999; Shane & Venkataraman, 2001). Decision-making studies in the field of entrepreneurship have confirmed that entrepreneurs have strong tendency to use cognitive mechanisms such as biases and heuristics to simplify their decision-making processes (Manimala, 1992) and compared to non-entrepreneurs, they show higher levels of cognitive bias (Busenitz and Barney, 1997; Kaish and Gilad, 1991; Palich and Bagby, 1995). Bias, which is defined as “the systematic deviation from rationality or norms in judgment and decision-making” (Zhang & Cueto, 2015, p.2), causes the individuals to develop personal rules to make decisions instead of following rationality and logic. Studies have also demonstrated that entrepreneurs use certain biases more than others, such as overoptimism and overconfidence (Busenitz and Barney, 1997; Palich and Bagby, 1995). For instance, overconfidence bias explains the mismatch that exists between entrepreneurs' predictions of their ventures’ success and actual survival data of start-up firms (Kahneman and Lovallo, 1994). Camerer and Lovallo (1999) investigated overoptimism bias and concluded that overoptimism is an important factor contributing to failure among new firms. Due to their importance, overoptimism and overconfidence have been repeatedly studied in the field of entrepreneurship. However, other entrepreneurial biases which seem to have considerable impact on entrepreneurial behavior have not been sufficiently studied with regard to failure and the death of the new ventures, or even if studied, their relationship with other important elements such as counterfactual thinking or effectuation is not explored. For instance, the bias of escalation of

commitment is identified to influence the entrepreneur's reinvestment decisions to expand or contract the business (McCarthy, Schoorman, & Cooper, 1993) and the decision to develop new products (Schmidt and Calantone, 2002). This bias explains why the individuals, in general, cannot overcome the inertia to quit while outcomes do not meet expectations (Lunenburg, 2010). On the other hand, the bias of illusion of control, which occurs when the individuals judge themselves to have control over the outcomes even if the outcomes are uncontrollable (Alloy & Abramson, 1979; Langer, 1975), can prevent individuals from making exit decisions. According to Langer (1975), illusion of control causes the individuals not to distinguish between chance and skill-determined events. Individuals who have this bias show a high tendency to prevent the negative consequences that they perceive as uncontrollable. Therefore, even in the situations where external elements, chance, or luck play a crucial role in achieving an outcome, individuals try to rely on their skills to influence the outcome.

Effectuation, as a type of reasoning that does not follow some aspects of rational decision-making which focuses too much on information search, if studied along with these entrepreneurial biases and other cognitive processes of mind such as counterfactual thinking, can make a significant contribution to the field of entrepreneurial decision-making. The reason for this assertion is that effectuation and entrepreneurial biases have interesting specifications in common.

Individuals with a strong illusion of control are likely to have different approaches to the perception of failure than those with low or no illusion of control. Langer (1975) argues that temporary loss of control is anxiety-arousing, and the feeling that an individual does not have enough control over a topic increases the tendency of a person to give up in the form of failure. Under such circumstances, the individual starts to attribute the failure to the bad luck, while any

forms of success and progress would be attributed to personal skills. On the other hand, the illusory belief that outcomes can be under control changes the attitude of the individual toward the perception of failure. In life threatening situations, and in the situations that there are signs of failure, illusion of control keeps people motivated, optimistic and hopeful, since they believe that they have control over outcomes. This also can diminish the negative influence of anxiety produced after the perception of failure.

Although these biases seem to have a strong impact on decision-making, an individual's type of reasoning can make a difference in the decisions. In 2001, Sarasvathy brought forth the idea that individuals may have approaches beyond their rationality while making decisions. According to her findings, entrepreneurs have different perspectives toward elements such as prediction and control of the future. In a similar vein, entrepreneurial biases such as illusion of control deal with cognitive processes that go beyond the individual's rationality. Some scholars argue that effectuation may enhance a firm's probability of failure (Dew, Sarasvathy, Read, & Wiltbank, 2009; Wiltbank, Read, Dew, & Sarasvathy, 2009) however, there is not empirical evidence for this claim.

In this study, I explore the interaction between entrepreneurial biases such as escalation of commitment and illusion of control with effectuation, in order to investigate whether this interaction can reduce the probability of exiting the market or not. In addition, this study also aims to determine how the interaction of these cognitive processes – entrepreneurial biases, effectuation, and counterfactual thinking – would influence learning. Consequently, the following research questions are addressed in this manuscript:

Research question 4: "Do the interactions among effectuation and entrepreneurial biases, and counterfactual thinking influence entrepreneur's exit decisions?"

Research question 5: “Do the interactions among effectuation and entrepreneurial biases, and counterfactual thinking influence learning?”

This study also explores the influence of a set of variables as moderators of identified relationships between independent and dependent variables. For instance, fear of failure, critical setback experiences, and learning attitude towards failure will further influence the exit decisions of the entrepreneurs and their learning. These variables make different contributions to the complete cognitive process of the entrepreneur. For instance, while fear of failure might be considered as an inhibitor of entrepreneurial action, a positive learning attitude toward failure can enhance entrepreneurial performance. Scholars in the field of entrepreneurship research also claim that entrepreneurs may withdraw from entrepreneurship and may decide not to pursue the business ideas that they may have once decided to pursue, due to their fear of failure (Hsu et al., 2017). According to this argument, fear of failure is likely to inhibit taking any courses of action. Many novel ideas therefore remain unpursued.

In this study, I take a different approach toward fear of failure. I argue that when entrepreneurs start their entrepreneurial journey, fear of failure does not disappear, due to the risky and uncertain nature of the environment in which entrepreneurs are performing. However, the type of fear changes. Once entrepreneurs overcome the prior fear of failure related to pursuing opportunities, they begin to deal with the fear of not achieving the expected goals. Fear can be triggered by the uncertainties of the environment. In this condition, entrepreneurs identify with effectual approaches for decision-making to overcome uncertainties (Sarasvathy, 2001a). In this research, I will examine the underlying relationships that exist between such failure-related phenomena and the decision of entrepreneurs to exit the market as well as those phenomena and the entrepreneurs’ learning abilities.

The findings of this study will contribute to the field in several ways. First, my study has theoretical implications for scholars who investigate the exit decisions of entrepreneurs dealing with cognitive entrepreneurial biases. This study helps to further understand how effectuation contributes to exit decisions of entrepreneurs and their learning capabilities.

In addition, this study offers a new perspective on fear of failure and enhances previous conceptualizations of this fear. Fear of failure, as an emotion, has been widely discussed to be active prior to the start of a new venture. In this study, I investigate the influence of fear of failure during the expansion stage of the new venture. Thereby this study provides a more refined research approach for entrepreneurship researchers in particular, and achievement theorists in general.

In practical terms, my research goes some way toward answering the question of why some individuals insist on continuing their entrepreneurial journey while failure-related phenomena such as critical setbacks and counterfactual thoughts exist. Entrepreneurs can also become aware of their psychological dispositions and biases and can attempt to train their minds in overcoming biases that could be harmful to the wellbeing of their new ventures. They also may learn how to keep a positive attitude toward failure in order to boost their learning capabilities. The result of the study can help entrepreneurs to understand where effectual logic can help them and where they need to implement rational reasoning.

In order to address the research questions, I will provide a comprehensive literature review of the constructs in the next chapter. In chapter 3, I will develop the hypotheses of the study and I will present the research model of the study. In chapter 4, I will explain and clarify the research design of my study, the target sample, and the type of statistical analysis that will be used to test the hypotheses.

CHAPTER II

LITERATURE REVIEW

In this chapter, I will provide a literature review on the constructs under study: effectuation, counterfactual thinking, critical setback experiences, illusion of control, escalation of commitment, fear of failure, attitude toward failure, entrepreneurial learning, and entrepreneurial exit. First, I will gather together the previous findings in the field of entrepreneurial decision-making in order to help readers to understand how the current manuscript will expand the knowledge on decision making. Effectuation, as the independent variable of my study, represents an entrepreneurs' decision-making style. Therefore, a review of the literature on effectuation provides a thorough understanding of the conducted studies in the field of effectuation. This helps to find out about possible gaps in this field and learning about the role of effectuation in the field of entrepreneurship. Following that, I will also review the literature with respect to mediators and moderators of the study. I will also make a thorough review of counterfactual thinking and entrepreneurial biases as major contributing factors to the relationship between independent and dependent variables of my study. Since my proposal also includes failure-related factors such as fear of failure and attitude toward failure as moderators, I will also provide a review of these failure-related factors as well as past findings and prior research with regard to dependent variables of my study. For each section, I will include the

conceptualization and the definition of the construct in addition to a review of existing empirical and conceptual research.

Entrepreneurial Decision-Making

Entrepreneurial decision-making research is basically built on the models employed by neoclassical micro-economic theory (Stigler, 1952). These models assert that individuals are rational decision makers who conduct thorough research in order to make a decision. In 1978, March interpreted differences in rational choice and indicated that "Rational choice involves two guesses, a guess about uncertain future consequences and a guess about uncertain future preferences" (1978, p. 587). Both of these guesses explain that rationality requires a prediction of the future, whether this is about uncertain outcomes that should be predicted or about uncertain preferences and demands.

In his paper, *Bounded rationality, ambiguity, and the engineering of choice,* March pointed out that guessing about uncertain future consequences is a matter of intelligence and rationality. This view is similar to the neoclassical micro-economic view which believes decisions should be made based on precise and comprehensive information search. However, according to him, these elements are not always the case and decisions cannot be made by pure rationality. As discussed earlier, in order to guess about uncertain future preferences, there also needs to be a "technology of foolishness". March argues that in order to make a decision, individuals either use a technology of rationality or a technology of foolishness. Each one of these technologies as a tool help the individuals to make specific decisions. However, foolishness can sometime result in more favorable outcomes that are not achievable with pure rationality. March (1999) claims that rationality contributes to organizational performance; however, it is the technology of foolishness that helps to escape rational reasoning. In 2006,

March clarifies that these technologies are not enemies and technologies of foolishness depend on technologies of intelligence. In other words, technology of rationality/intelligence may pave the way to achieve an outcome and technology of foolishness can further empower the individuals to take risk in situations in which rationality cannot take further steps.

By introducing the principle of effectuation, Sarasvathy (2001b) indicated that entrepreneurs can implement a reasoning and decision-making style that opposes rational decision-making. This type of decision making is built on causal reasoning and logic to make decisions and rely on the logic of prediction while effectual approaches rely on the logic of control. Effectuation does not depend on systematic analysis of information to predict the future; rather, it claims that individuals assess who they are, what they know, and whom they know in order to control the unpredictable future. Entrepreneurs with effectual reasoning try to determine what kinds of abilities, resources and networks they possess – these are called upon as the means that entrepreneurs use to achieve goals – and based on this set of means at hand they set goals to achieve. According to effectuation perspective, entrepreneurship is not just about finding the existing opportunities; rather it is about co-creation of new opportunities with the help of stakeholders. This view indicates that in order to move forward in the entrepreneurial journey and to be successful in pursuing and exploiting opportunities, entrepreneurs need to go beyond rationality.

Sarasvathy (2001a) defined causation and effectuation and developed the theory of effectuation. According to her, entrepreneurs make decisions which are beyond their rationality. Sarasvathy (2001b) termed rational decision making as causation and indicated that individuals' level of emphasis on rationality varies. Some individuals might be absolute rational decision makers, while others may be rational at some points and irrational decision makers at other

points. The difference between causation and effectuation is well defined as these constructs are two ends of the same continuum in decision making. Therefore, high effectuation is similar to low causation and vice versa. In this study, I will investigate how different effectuation levels can impact exit decisions of entrepreneurs and their learning. Therefore, I will provide an in-depth literature review on the topics of effectuation and causation as two different sides of the same coin.

Causation

According to neo-classical economic theory, entrepreneurs discover opportunities by implementing purposeful research (Drucker, 1998; Fiet, 2002). According to this theory, finding more entrepreneurial opportunities is a matter of rational decision-making, comprehensive information search, and developing entrepreneurial skills in collecting data (Bird, 1989, Caplan, 1999).

Sarasvathy (2001a) refers to rational decision-making approach as causation – the decision-making which is based on causal reasoning. She posits that during a causation process, individuals set goals first, then decide what type of means they need in order to achieve the goals so they select between means to create that outcome (Sarasvathy, 2001a). The causation decision-making approach is consistent with planned strategy approaches (Ansoff, 1988; Brews and Hunt, 1999; Mintzberg, 1978) and roots in precise calculation, statistical inference, and an accurate analysis which help to predict the outcomes and future (Sarasvathy, 2001a).

Entrepreneurs with causal reasoning clearly define the objectives they want to achieve, and conduct a thorough research to accomplish those objectives (Fiet, 2002). Through a causal approach the entrepreneur tries to maximize the expected returns (Drucker, 1998). Causal entrepreneurs believe that prediction is the most important factor in controlling the future and

assert that “To the extent we can predict the future, we can control it.” (Sarasvathy, 2001a, p. 251).

The essence of causation and rational decision-making is to gather all possible information relevant to a decision and to find out what could be the expected returns for different options (Viale, 1992; Chandler, DeTienne, McKelvie, & Mumford, 2011). Consequently, excellence in opportunity recognition requires comprehensive search and superior ability to evaluate all the alternatives in order to find the option with the highest expected return (Fiet, 2002). Entrepreneurs with a causation approach rely on business plans to increase their gains and benefits through maximizing efficiency (Honig and Karlsson, 2004). Business plans as an example of “institutional conformity to the causation approach” (Chandler et al., 2011, p.377) help the entrepreneurs with causal logic to engage in planned entrepreneurial activities and to increase their expected and predictable returns.

Effectuation

In contrast to causation approach, which is based on pure rationality and statistical inference, the effectuation model of decision-making and entrepreneurial reasoning asserts that not all decisions would be made through rationality (Sarasvathy, 2001a). The most vivid difference between causation and effectuation is that causation uses causal reasoning to set goals and then select means to achieve the goals, while effectuation uses a set of means to create an effect, outcome, or a goal. According to effectuation perspective (Sarasvathy, 2001a), entrepreneurs do not follow the rational decision-making logic inherent in the causation approach to make decisions, in fact, they do not do comprehensive research and data analysis to make the right decision. Instead, they explore what sort of means – resources – they have and then choose between different outcomes that can be created by the selected set of means (Sarasvathy, 2001a).

Sarasvathy makes an interesting comparison between these approaches by giving the example of cooking. A person with causal logic first decides what to cook, then check the recipes, find out about the needed ingredients, and then start cooking while a person with effectual reasoning indicates what ingredients are available then decides to make something based on the available ingredients.

In an effectuation approach, the focus is not on gathering as much information as possible in order to take any courses of action, rather the entrepreneur tries to learn more about who they are, what they know, and whom they know. However, it should be noted that entrepreneurs with effectuation reasoning may utilize the accessible information to modify, change, or improve their courses of action, but obtaining information is not the building block for entrepreneurial activity.

Effectuation perspective indicates that entrepreneurs follow their aspiration to start a new venture in the beginning and do not necessarily set an objective for creating a new venture (an effect). Rather, they utilize the available resources (set of means) in order to create an effect. This group of entrepreneurs believes that future is unpredictable. Therefore, instead of coming up with an accurate business plan for their new venture, they use their available resources and consider each approach to be part of a trial-and-error plan. This makes the effectuation approach to be flexible over time for necessary changes while in causation approach business plans are rigid in their nature. Scholars refer to effectuation as consistent with emergent strategies which flourish and emerge through the passage of time and refer to causation processes to be consistent with designed strategy models which would not change over time (Mintzberg, 1978; Chandler et al., 2007; Chandler et al., 2011). Entrepreneurs with an effectual decision-making style do not attempt to increase their expected returns. Instead, they make an estimation of how much loss they can afford by choosing each one of the alternatives. The aim of effectuation is to control the

uncertain future through utilizing the available resources rather than predict the future through gathering information. Effectual entrepreneurs believe that, "To the extent we can control the future, we do not need to predict it." (Sarasvathy, 2001a, p.251) Empirical evidence also supports the idea that entrepreneurs with effectual decision-making style are less likely to predict the future and more likely to take the control of the future through adjustment in their accessible means (Dew, Read et al., 2009).

A review of effectuation and causation literature indicates that although these constructs seem to be two completely distinct approaches to decision-making (Dew and Sarasvathy, 2002), they "…are integral parts of human reasoning that can occur simultaneously, overlapping and intertwining over different contexts of decisions and actions." (Sarasvathy, 2001a, p. 245). These two approaches as cognitive processes of mind cause the decisions of entrepreneurs to be different from one another. The differences between these approaches influence the individuals, here specifically entrepreneurs, to lean towards one approach more than the other while making decisions.

Interestingly, Dew, Read et al. (2009), compared novices and experts and found that expert entrepreneurs framed problems in a dramatically different way than MBA students. This study shows that MBA students are more likely to implement causation approaches to decision-making while expert entrepreneurs implement effectuation approach. The authors concluded that this finding shows that courses which are included in MBA program emphasizes on planning and market research to start a business. Therefore, students become mostly rational decision makers with lower effectual reasoning. Scholars also found that during different stages of starting a business, entrepreneurs use different problem-solving styles. Harting (2004) tested how different levels of uncertainty influence the way ventures come into existence and found that

entrepreneurs follow effectual logic in the early stages of creating a venture and use causal logic as the venture expands and ages. In a similar vein, Read and Sarasvathy (2005) compared nascent and expert entrepreneurs and argued that experts in the early stages of founding a venture prefer to behave based on effectuation principles rather than causation. They also found that successful entrepreneurs are more likely to start with effectuation, and as their ventures expand and become more established, they take more causal actions. They further demonstrated that experience teaches the entrepreneurs how to balance between these types of decision-making.

Many entrepreneurs have higher tendency to take risk or follow their intuition. They also prefer to rely on their available resources instead of finding investors. As the venture develops, their founders start to learn more about competitors and may try to collect data or predict future in order to succeed. Therefore, effectuation and causation are not absolute states in cognition and entrepreneurs may move from one to the other occasionally. Read and Sarasvathy (2005)

Effectuation decision-making style also influences the way opportunities come into existence (Sarasvathy, Dew, Velamuri, and Venkataraman, 2003). According to Sarasvathy et al. (2003) opportunities can be recognized, discovered, or created and the creation of opportunities follows the effectuation logic. As individuals grow from nascent entrepreneurs to experienced or serial entrepreneurs who found ventures one after the other, their decision-making skills change. The experience helps them to switch between causation and effectuation decision-making styles in order to discover more opportunities and to improve their overall entrepreneurial performance.

Empirical evidence in this field indicates that, in an uncertain environment, entrepreneurs follow effectual rather than causal logic (Sarasvathy & Kotha, 2001; Harmeling, Oberman, Venkataraman, & Stevenson, 2004). The reason could rely on the fact that uncertainty makes it

difficult to gather the information required to make a rational decision. Under the conditions of uncertainty, the obtained information could easily become unreliable and useless since the dynamics of the environment in which the new venture is performing is changing constantly. In order to survive, the entrepreneur might use effectual logic to stay flexible, change the strategies and behavior, and receive favorable outcomes.

The differences between effectuation and causation can be summarized into five principles: first, causation has a defined objective to achieve while effectuation uses a set of means and selects between possible effects. Second, causation focuses on predicting the future and finding the ultimate objective that the new venture wants to accomplish, whereas effectuation tries to recognize the opportunities in an unpredictable future. Third, effectuation focuses on identifying the maximum loss which is affordable for the new venture while causation focuses on maximizing the expected returns by choosing the best alternative. Fourth, causation relies on business planning in order to predict the future and to control it, whereas effectuation emphasizes on pre-commitments and strategic alliances to control an unpredictable future; and fifth, effectuation focuses on uncertainties within the environment and how to stay flexible whereas causation focuses on exploiting the pre-available capabilities and resources (Chandler et al., 2011; Sarasvathy, 2001a). Table 1, adopted from the work of Sarasvathy (2001a), provides a detailed explanation of the differences between these approaches.

The review of the literature provided here on the constructs of effectuation and causation helps to understand how different decision-making styles can make important contributions to entrepreneurial behavior in general. In Table 2, a list of important studies in the field of entrepreneurial decision-making is provided with a brief summary of the paper.

Table 1: Categories of Differentiation: Causation Processes & Effectuation Processes – Adopted from Sarasvathy (2001a)

Categories of Differentiation	Causation Processes	Effectuation Processes
Givens	Effect is given	Only some means are given
Decision-making selection criteria	Help choose between means to achieve the given effect	Help choose between possible effects that can be created with given means
	Selection criteria based on expected return	Selection criteria based on affordable loss or acceptable risk
	Effect dependent: choice of means driven by characteristics of the effect the decision maker wants to create and his or her knowledge of possible means	Actor dependent: given specific means, choice of effect is driven by characteristics of the actor and his or her ability to discover and use contingencies
Competencies employed	Excellent at exploiting knowledge	Excellent at exploiting contingencies
Context of relevance	More ubiquitous in nature	More ubiquitous in human action
	More useful in static, linear, and independent environment	Explicit assumption of dynamic, nonlinear, and ecological environment
Nature of unknowns	Focus on the predictable aspects of an uncertain future	Focus on the controllable aspects of an unpredictable future
Underlying logic	To the extent we can predict future, we can control it	To the extent that we can control future, we do not need to predict it
Outcomes	Market share in existing markets through competitive strategies	New markets created through alliances and other cooperative strategies

Table 2: Entrepreneurial Decision-Making

Author(s)	**Contribution on Effectual Decision-Making logic**	**Type of the Study**
March, 1978	"Rational choice involves two guesses, a guess about uncertain future consequences and a guess about uncertain future preferences" (p.598). The paper discusses "technology of foolishness" and "technologies of rationality". Technologies of rationality underlie technologies of foolishness.	CONCEPTUAL
Stevenson and Gumpert (1985)	It is safer to stay with familiar (opportunities)! Entrepreneur's thought pattern is in answering questions such as: Where is the opportunity? How do I capitalize on that? How do I take the control over it? *Causation* is the basis for decision making.	CONCEPTUAL
Bird (1989)	Individuals are involved in rational goal-driven behaviors when pursuing entrepreneurial opportunities. *Causation* is the basis for decision making.	CONCEPTUAL
Drucker (1998)	Opportunities are discovered through purposeful search process. *Causation* is the basis for decision making.	CONCEPTUAL
Sarasvathy (1998)	Compared to bankers, entrepreneurs showed higher effectuation-related behaviors. Causation and effectuation are contrasted by using verbal protocols.	EMPIRICAL
Sarasvathy, Simon, & Lave (1998)	Entrepreneurs and non-entrepreneurs are compared similar to the study of Sarasvathy (1998) with similar results.	EMPIRICAL
Sarasvathy (2001a)	Individuals do not necessarily start with a clear objective; rather they begin with a generalized aspiration and then try to fulfill it by utilizing available resources.	CONCEPTUAL
Sarasvathy & Kotha (2001)	In their field study, the authors found that entrepreneurs act based on effectual logic when facing with uncertainty rather than causal logic.	EMPIRICAL
Dew and Sarasvathy (2002)	Effectuation is different from causation; however, effectuation can be integrated with other management theories.	CONCEPTUAL
Sarasvathy, Dew, Velamuri, & Venkataraman (2003)	Opportunities can come to existence through one of the three different processes of recognition, discovery, and creation. Effectuation helps to *create* the opportunities.	CONCEPTUAL
Harting (2004)	In their field study, they found out that entrepreneurs follow effectuation principles in the early stages of founding a business.	EMPIRICAL

Harmeling et al. (2004)	The authors found evidence that when uncertainty is high, in the early stages of creating a venture, entrepreneurs make decisions based on effectual logic and over the course of time, they switch to causal logic.	EMPIRICAL
Read and Sarasvathy (2005)	Effectual logics influence new venture performance. Experienced entrepreneurs are more able to balance between causal and effectual logics. In addition, in the early stages of founding experts are more effectual than at later stages. Availability of resources also affects effectuation and causation levels.	CONCEPTUAL
Sarasvathy and Dew, (2005)	Entrepreneurs use three entrepreneurial logics to predict uncertain future: identity, action, and commitment as opposed to the logics of preferences, belief, and transaction. Technology of foolishness is tested.	EMPIRICAL
Goel and Karri (2006)	Over-trust is a result of using effectual logic. Combination of effectual logic with specific personality characteristics, such as a high degree of non-conformity, high self-efficacy, high-achievement orientation, and preference for innovation, causes the entrepreneur to trust more than what is warranted. Cultural characteristics such as collectivism and high uncertainty avoidance also intensify over trust.	CONCEPTUAL
Wiltbank, Dew, Read, and Sarasvathy (2006)	Among different types of strategies, effectuation is categorized to be a transformative strategy. Transformative strategies create new goals and new environments from current realities. Instead of focusing so much on predictive methods, effectual thinkers obtain techniques of control.	CONCEPTUAL
Chiles, Bluedorn, and Gupta (2007)	An alternative to the Austrian approach (creative destruction) and Kirzner's approach (entrepreneurial discovery) to entrepreneurship is offered based on Lachmann's work. Unlike the first two approaches which are committed to an equilibrium paradigm, Lachsmann's approach explains the disequilibrium phenomena. Creative imagination explained by Lachsmannian's perspective is mentioned to be congenial with effectuation.	CONCEPTUAL
Chiles, Gupta, and Bluedorn (2008)	Possible differences and distinctions between lachsmannian and effectuation are discussed.	CONCEPTUAL
Dew, Read, Sarasvathy, and Wiltbank (2008)	New ventures engage in more effectual thinking than established firms.	CONCEPTUAL
Dew, Sarasvathy, Read, and Wiltbank (2008)	In an effectual universe, instead of seeing the role of markets as "markets selecting on firm product offers" the entrepreneur sees the role of firms as "firms building and transforming product markets". Innovators' dilemma suggests that firms lose their current markets in order to create what current	CONCEPTUAL

	customers want; according to effectual reasoning, firms can avoid such a dilemma if they create the markets as well as the products.	
Karri and Goel (2008)	Trust is not a predictive strategy. Effectuators over-trust within the affordable loss criterion they have set. Entrepreneurs trust and over-trust deliberately, and make the risk of trusting irrelevant by following effectual logic. In response to the second proposition of Sarasvathy and Dew (2008a), authors argue that it is not necessary to require all the parties to reason in an effectual manner.	CONCEPTUAL
Sarasvathy (2008)	Book on the development of entrepreneurship, theory of effectuation is discussed in details and other similar approaches to entrepreneurial decision making are also provided.	CONCEPTUAL
Sarasvathy and Dew, (2008a)	The authors argue that over-trust is irrelevant to effectual logic and psychological characteristics of the entrepreneurs are irrelevant while viewing entrepreneurship from effectual lens. Two assumptions: trusting falls under the domain of predictive strategies, effectual reasoning requires that both parties to the transaction use non-predictive strategies and effectual reasoning.	CONCEPTUAL
Sarasvathy and Dew, (2008b)	Effectuation differs from Lachmannian entrepreneurship in terms of problems of knowledge, resources, and institutions.	CONCEPTUAL
Sarasvathy, Dew, Read, & Wiltbank (2008)	Effectuators use transformational approaches (high control, low prediction); therefore, they design both organizations and environments.	CONCEPTUAL
Dew, Read, Sarasvathy, & Wiltbank (2009)	According to this paper, expert entrepreneurs use effectual logic for decision-making while novices use predictive logic of decision-making which also is referred as “go by the textbook”. Expert and MBA students are interviewed and a think aloud method is used.	EMPIRICAL
Wiltbank, Read, Dew, & Sarasvathy (2009)	Angel investors of new ventures can implement two different strategies of thinking, predictive and non-predictive. Those who choose predictive method make significantly larger investments than those who use non-predictive methods.	EMPIRICAL
Read, Song, & Smit (2009)	According to this meta-analysis there is initial empirical support for a positive relationship between an effectual approach to strategy making and new venture performance. The results of the study show that means *What I know*, *Who I am*, and *Whom I know* are significantly and positively related to the firm performance, partnership as the second principle of effectuation is found to be significantly and positively related to new venture performance, affordable loss construct is not significantly related to new venture performance. Leverage contingency is found to be positively and significantly related to new venture performance.	EMPIRICAL
Dew, Sarasvathy, Read, Wiltbank (2009)	The paper gives four propositions on affordable loss by using entrepreneurs’ plunge decisions. Propositions are as follows: 1, an entrepreneur using affordable loss reasoning will be more likely to	CONCEPTUAL

	take the plunge than one using either expected returns or real options reasoning; 2, Weakly-coupled forms of payment will raise a potential entrepreneur's level of affordable loss and, therefore, increase both the likelihood of taking the plunge and the ability to take it; 3, When entrepreneurs account in time (versus money), they will have higher levels of affordable loss and, therefore, will be more likely to take the plunge; and 4, entrepreneurs who make the plunge decision using the affordable loss heuristic will be less susceptible to escalation of commitment than those who use calculations of expected returns.	
Read, Dew, Sarasvathy, Song, &Wiltbank (2009)	The authors ask how people approach marketing in the face of uncertainty when the product, the market, and the traditional details involved in market research are unknowable. Expert entrepreneurs use effectual logic for decision-making while managers with little entrepreneurial experience use predictive logic of decision-making. Think aloud method is used.	EMPIRICAL
Chandler, DeTienne, McKlevie, & Mumford (2011)	By conducting a field study, the authors develop a measure of causation and effectuation.	EMPIRICAL
Perry, Chandler, & Markova (2012)	Review of effectuation literature with the aim of encouraging effectuation research and a discussion on the design of effectuation studies.	CONCEPTUAL
Brettel, Mauer, Engelen, & Kupper, (2012)	The authors develop the characteristics of effectuation in R&D projects compared to causation. A multi-factor measurement model of effectuation and causation in R&D context is developed. Hypotheses of the study are: (a) effectuation is positively related to success in highly-innovative contexts, (b) causation approaches are beneficial in projects with low levels of innovation. In the study, logic of effectuation and causations are extended from entrepreneurship field to corporate R&D projects.	EMPIRICAL
Kalinic, Sarasvathy, & Forza, (2014)	The authors conduct 5 case studies. They argue that unlike the international entrepreneurship literature which claims entrepreneurs increase their international activity without having a precise goal in an unplanned manner, following effectual rather than causal logic helps entrepreneurs to their commitment in international markets and to overcome the liabilities of outsidership. Propositions: in conditions of high uncertainty, the switch from causal to effectual logic allows rapidly increasing the level of commitment in the foreign market; in conditions of goal ambiguity and environmental isotropy, the switch from causal to effectual logic allows overcoming liabilities of outsidership and, thus, successfully increasing the level of commitment in the foreign market.	EMPIRICAL
Valliere, (2015)	The article develops a measure of entrepreneurial intent which is processual and effectual. The author claims that many prospective entrepreneurs employ effectual logic that influence the formation of intent.	EMPIRICAL

Werhahn, Mauer, Flatten, & Brettel, (2015)	Effectuation is extended from individual level to firm level. At firm level effectuation can be understood as strategic direction reflecting a mindset that emphasizes the entrepreneurial behavior of employees.	EMPIRICAL
Dew, Read, Sarasvathy, and Wiltbank, (2015)	Entrepreneurial expertise yields significant decision-making improvements in the situational use of control strategies which are conceptually associated with uncertain new ventures, products and markets. The authors argue that one of the most important elements that makes a difference between the performance of experts and novices is pattern recognition capability. This study also indicates that more expert entrepreneurs are likely to switch cognitive gears when they perceive a highly uncertain situation and favor choices that rely less on prediction. Scenarios are given.	EMPIRICAL
Ciszewska-Mlinaric, Obloj and Wasowska, A. (2016)	The article aims to indicate what decision-making logic (effectuation or causation) is dominant in new venture internationalization process and what influences its changes over time. The findings indicate that, decisions making logic in early stages of growth and internationalization cannot be assigned to one of these logics, rather it may shift from one to another overtime.	EMPIRICAL
Frigotto and DellaValle (2016)	This study investigated the role of gender in entrepreneurial decisions. The authors found that men rely on the effectuation framework more than women and that diverse stored information mediates gender differences in adopting effectual criteria. They also concluded that that women do not adopt the effectual 'affordable loss' decisional criterion more than men despite their stronger perception for negative consequences and worst-case scenarios.	EMPIRICAL
Guo, Cai, and Zhang (2016)	The authors developed and tested a theoretical model that links venturing principles (effectuation or causation) to new internet venture growth through resource bundling (pioneering or stabilizing). The findings of the study show that both effectuation and causation are positively associated with new internet venture growth. Effectuation leads to pioneering resource bundling, which in turn contributes to new internet venture growth. Causation also contributes to new internet venture growth, but through stabilizing resource bundling.	EMPIRICAL
Reuber, Fischer, and Coviello (2016)	Highlighting the pragmatist roots of effectuation theory, the authors suggest that effectuation research has thus far emphasized one aspect of pragmatism —creativity—while a second aspect of pragmatism—habit—has been underexplored.	CONCEPTUAL
Welter, Mauer, and Wuebker (2016)	The authors tried to clarify how the three concepts of opportunity creation, effectuation, and bricolage relate to each other, complement one another, and where they diverge. This article examined the roots of each of these concepts and their underlying assumptions, organizing them within a unifying conceptual frame.	CONCEPTUAL

Cai, Guo, Fei, and Liu (2017)	The authors examined the effect of effectuation on new venture performance in the context of Chinese transitional economy by examining the role of exploratory learning as a key mediator. Findings indicate that effectuation has a positive effect on new venture performance and exploratory learning plays a fully mediating role in the relationship between effectuation and new venture performance.	EMPIRICAL
Deligianni, Voudouris, and Lioukas (2017)	This study applies the lens of effectuation to product diversification and examines the moderating effects of effectuation processes on the relationship between diversification and performance in new ventures. The findings indicate that, with the exception of affordable loss, effectuation processes exert a positive effect on the diversification–performance relationship.	EMPIRICAL
Jisr and Maamari (2017)	In this study, the authors proposed effectuation as a new dimension of tacit knowledge (in addition to its two dimensions: the cognitive and technical).	EMPIRICAL
Laine and Galkina (2017)	The authors explored how SMEs that are heavily involved in relations with international suppliers evaluate, enact and respond to increased institutional uncertainty related to Russia's foreign trade sanctions. This longitudinal multiple-case study reveals that although firms simultaneously use both causation and effectuation in their decision making, an increase of institutional uncertainty boosts effectuation. Also, the studied firms use effectuation logic differently enabling us to distinguish two types of effectuation with contrasting performance implications: opportunity-driven effectuation and survival effectuation.	EMPIRICAL
Laskovaia, Shirokova, and Morris (2017)	The authors examined the mediating role of cognitive logic in explaining venture performance in differing cultural contexts. The findings indicate that venture cognitive logics have positive effects on new venture performance and effectuation serve as mediators in the culture-performance relationship. Based on these findings, the authors concluded entrepreneurial reasoning is shaped not only by personal characteristics of entrepreneurs but also by aspects of the cultural context.	EMPIRICAL
Long. Xia, and Hu (2017)	This paper investigated the effects of patterns of opportunity discovery and the innovativeness of entrepreneurial opportunity on the decision-making process of effectuation in new venture creation. The findings indicate that patterns of opportunity discovery have significant positive effects (at least partially) on effectuation. Namely, entrepreneurs employing fortuitous discovery tend to use available means and leverage contingency. And with lower innovativeness of opportunity, entrepreneurs are more likely to use affordable loss and leverage contingency.	EMPIRICAL
Matalamäki (2017)	This paper investigated the stages of effectuation theory and concluded that there are four main streams linked to effectuation theory in the current scientific dialogue: innovation and product development, internationalization, effectuation and causation simultaneously, and entrepreneurial expertise.	EMPIRICAL

Matalamäki, Vuorinen, Varamäki, and Sorama (2017)	This article illustrated how ten selected industrial companies have managed to accomplish rapid growth after a long period (3–5 years) of slow growth. A particular aim was to determine whether these companies grew by adapting to the situation and responding to the demands of the market with their resources (effectuation) or by following previously determined plans and proceeding towards set goals (causation). The findings indicate the usage of both logics, but in nine of the ten companies' effectuation influences as the dominant approach. Only one of the ten studied companies can be stated to follow the operating principles of causation.	EMPIRICAL
Ortega, García, and Valle Santos (2017)	According to the authors new product development (NPD) research has mainly adopted the causation lens, in which planning plays an important role and has not paid enough attention to the role of effectuation. By embracing the logic of effectuation, the authors tried to secure a wider perspective concerning how the various NPD options develop, taking into account the role played by uncertainty. The results showed that NPD processes undertake a hybrid behavior in all the projects and effectuation emerging as the dominant logic in the project linked to a greater degree of innovation and uncertainty.	EMPIRICAL
Reymen, Berends, Oudehand, and Stultiëns (2017)	The study investigated the decision-making logics used by new ventures to develop their business models. In particular, new ventures focused on the logics of effectuation and causation and how their dynamics shape the development of business models over time. The authors found that the effectual decision-making logic was used dominantly to generate a viable value proposition for a specific customer segment. Causal logic is then used dominantly to define the other business model components in relation to the value proposition and customer segment.	EMPIRICAL
Eyana, Masurel, and Paas (2018)	The authors investigated the implications of causation and effectuation behavior of Ethiopian entrepreneurs on the eventual performance of their newly established small firms. The findings reveal a varied effect of causation and effectuation on financial and non-financial measures. Causation is positively related to an increase in employment size, whereas the overall effect of effectuation is positively related to financial performance measures, although its dimensions vary in their effects on sales, profit and assets increase.	EMPIRICAL
Futterer, Schmidt, and Heidenreich (2018)	The study investigated the effectiveness of effectuation and causation as primary entrepreneurial logics to create business model innovation (BMI). The results indicate that both behaviors lead to BMI in situations of moderate industry growth while effectuation (causation) is more effective in high (low) industry growth settings. Furthermore, the results point out that BMI in turn enhances corporate venture performance.	EMPIRICAL
Hubner and Baum (2018)	The authors developed a conceptual framework for explaining how effectual and causal logics influence entrepreneurs' leadership behavior and how that, in turn, impacts employee individual-level outcomes (commitment, extrinsic and intrinsic motivation, and creativity) and performance outcomes (employee work performance and firm performance). They proposed that employees' commitment and	CONCEPTUAL

	motivation develop via distinct paths when entrepreneurs apply causal or effectual logics and furthermore theorized that employees' creativity is facilitated by effectuation, but hindered by causation. These differences might explain firm internal consequences of applying effectuation as a decision logic.	
Nicholls-Nixon and Valliere (2018)	Drawing on Effectuation Theory, the authors explain performance of business incubators in terms of strategic orientation. The extent to which incubator managers enact a causal or effectual strategic orientation shapes their approach to incubator management. In turn, performance is enhanced only when there is a match between the needs of the incubatees and the incubation process in-use.	CONCEPTUAL
Schmidt, Bendig, and Brettel (2018)	The study investigated the effects of the decision-making style of angel investors on their investee businesses' valuations with a particular focus on the early post-investment phase. Based on a sample of 73 angel investments, findings indicated that informal investors experience a significant increase in their investments' valuation if they emphasize the effectual principle of means-orientation in their decision-making.	EMPIRICAL
Servantie and Rispal (2018)	This article examined how the combination of causation, effectuation, and bricolage changes over a particular venture's life cycle (its emergence, growth and replication).	EMPIRICAL
Smolka, Verheul, Burmeister–Lamp, and Heugens (2018)	The authors tested the synergistic potential of effectual and causal logics and contributed to the debate on entrepreneurial decision-making by exploring the interrelationship between causation and effectuation, detailing their main and interactive effects on venture performance. Findings indicated that ventures benefit from using these two entrepreneurial logics in tandem.	EMPIRICAL
Stroe, Parida, and Wincent (2018)	This paper investigates nascent entrepreneurs' use of effectuation and causation. The configurational effect of passion, entrepreneurial self-efficacy, and risk perception is tested for causal and effectual decision-making. The results, based on data gathered from 50 nascent entrepreneurs, show that, more than passion, entrepreneurial self-efficacy, and risk perception alone, it is their combination that leads to the use of a causal and an effectual logic.	EMPIRICAL
Villani, Linder, and Grimaldi (2018)	The study explored the antecedent factors of the approach that science-based entrepreneurs follow in new venture creation. The authors identified two configurations of antecedent factors relevant for science-based founders to successfully launch their ventures, and two for nonscience-based founders.	EMPIRICAL
Welter and Kim (2018)	Using an agent-based simulation model, the authors investigated the effectiveness of effectuation relative to causation in uncertain and risky contexts. The results suggest that effectuation outperforms causation in both risky and uncertain contexts until the entrepreneur can predict the future correctly more than 75% of the time.	EMPIRICAL

Yu, Tao, Tao, Xia, and Li (2018)	Using data collected from 312 software firms in an emerging economy, the authors explored the effects of causation and effectuation on firm performance and the contingent interaction effects between causation and effectuation on firm performance from the perspective of organizational ambidexterity. Findings show that (1) causation and effectuation have a positive interaction effect on firm performance when environmental uncertainty is (relatively) high, but have a negative interaction effect on firm performance when environmental uncertainty is (relatively) low; (2) causation has a positive effect on firm performance in emerging economies; and (3) effectuation has a positive effect on firm performance in emerging economies when environmental uncertainty is (relatively) high. Our findings suggest entrepreneurial firms in emerging economies use a combination of causation and effectuation in a more uncertain environment, and adopt causation as a priority in a less uncertain environment.	EMPIRICAL
An, Rüling, Zheng, and Zhang (2019)	This study examines how firms' decision-making logics and entrepreneurial resourcing behaviors combine to create value. Conducting a qualitative comparative analysis investigating configurations of effectuation causation and bricolage that are associated with firm performance, the authors theorized three paths along which small early-stage firms can evolve into large late-stage firms while maintaining high performance.	EMPIRICAL
Grégoire and Cherchem (2019)	The authors content-analyzed a sample of 101 effectuation articles between 1998 and 2016 (inclusively), with the aim of uncovering the main conceptual and methodological articulations that have underpinned effectuation research to date. They made three recommendations for future advances, namely (1) conceiving effectuation as a "mode of action"; (2) developing new methodological indicators centered on effectuation's concrete manifestations; and (3) examining the underlying dynamics explaining effectuation's antecedents and consequences.	EMPIRICAL
Guo (2019)	The author investigated what factors promote the development of innovation strategy in high-tech new ventures. The findings indicated that effectuation has a positive effect on innovation strategy and opportunity shaping. Opportunity shaping has a positive effect on innovation strategy, and its effect is positively moderated by competitive intensity.	EMPIRICAL
Hauser, Eggers, and Güldenberg (2019)	On the basis of a qualitative study with 12 managers from 10 Swiss small-to-medium enterprises (SMEs), the authors analyzed the managers' decision-making approaches and distinguished between causal, effectual, and absence-of-strategy reasoning.	EMPIRICAL
Jiang and Ruling, 2019	The study identifies effectuation process characteristics and patterns and unveil the heterogeneity of effectuation processes.	EMPIRICAL
Jiang and Tornikoski (2019)	This study builds on effectuation theory to study differences in entrepreneurial behavioral logics during the new venture creation process. The results reveal four phases and suggest a possible evolution from a causal conditional relationship between perceived uncertainty and behavioral logics to an integrative	EMPIRCAL

	relationship. The findings in Phase 1 reveal that when entrepreneurs do not perceive uncertainty, their behavior is dominated by causation. Data in Phase 2 show that entrepreneurs perceive different types of uncertainty when unanticipated consequences occur, and the sequences in which entrepreneurs develop perceived uncertainty establish the conditions for effectuation. Phase 3 shows that when entrepreneurs perceive state, effect and response uncertainty, they actively combine causation and effectuation. When entrepreneurs perceive less uncertainty in Phase 4, they are more likely to use causation.	
Karami, M., Wooliscroft, and McNeill (2019)	This study systematically reviews the SME internationalization literature to clarify the ways effectuation theory helps international entrepreneurship (IE) scholarship respond to key questions of how international opportunities are developed.	CONCEPTUAL
Kerr and Coviello (2019)	Effectuation is a network-driving and network dependent phenomenon and understanding networks and network processes is essential to understanding the dynamics of effectuation.	CONCEPTUAL
McKelvie, Chandler, DeTienne, and Johansson (2019)	The authors addressed issues related to the measurement of effectuation, highlighted the challenges involved in effectively measuring effectuation and finally offered solutions and recommendations for systematic knowledge accumulation.	EMPIRICAL
Mansoori and Lackéus (2019)	Similarities and differences between effectuation and five other entrepreneurial methods along nine conceptual dimensions are discussed. The strengths of effectuation on a theoretical level could be used to develop other entrepreneurial methods. Conversely, the strengths of other entrepreneurial methods could be used to shore up the potential weaknesses of effectuation, such as a lack of behavioral tactics and limited applicability in later stages of venture development.	CONCEPTUAL
Prashantham, Kumar, Bhagavatula, and Sarasvathy (2019)	The authors extended research on the speed of new venture internationalization by distinguishing between effectual and non-effectual (i.e., causal) network-building approaches, and conceptualizing their differential effects on the dimensions of initial entry speed, country (i.e. international) scope speed and international commitment speed. an effectual approach to network-building is positively associated with initial entry speed and international scope speed, but negatively associated with international commitment speed, while a causal approach is negatively associated with initial entry speed and international scope speed, but positively associated with international commitment speed.	EMPIRICAL
Straußß, P., Greven, A., & Fischer, D. (2019)	The study validates the relationship between passion and effectuation as reducers to emotional exhaustion.	EMPIRICAL
Szambelan, Jiang, and Mauer (2019)	This study aims to understand how firms overcome market-based innovation barriers and achieve innovation performance using the effectuation orientation construct. The results indicate that effectual contingency and effectual means orientation are negatively associated with market-based innovation barriers, which are in turn negatively associated with a firm's innovation performance.	EMPIRICAL

Xu and Koivumäki (2019)	The authors argue that the challenge of firms has shifted from predicting the unknown or conventional method of venture creation to agile actions, which is to act rapidly before the competition catches up and eliminate any advantage one may have, especially for entrepreneurs and small businesses with significant resource constraints. They discussed how effectuation theory can be integrated with agile development and business model theory to address this challenge.	EMPIRICAL
Keskin, Wevesr, and Brezet (2020)	The authors investigated how sustainability-oriented ventures engage in product innovation processes based on the theory of effectuation. A longitudinal case study on four sustainability-oriented ventures revealed two different approaches to product innovation in such ventures, namely adaptive and exaptive approaches. While an adaptive approach is characterized by a long-term value proposition a venture engages in, and high-fidelity design experiments used to get the commitment of a select number of stakeholders to develop this predefined value proposition, an exaptive approach is characterized by short-term multiple value propositions a venture engages in, and low-fidelity affordable design experiments used to test market potential of these propositions through various stakeholder interactions.	EMPIRICAL
Kitching and Rouse (2020)	The authors evaluated whether the theory of effectuation provides – or could provide – a powerful causal explanation of the process of new venture creation by conducting an analysis of the principal concepts introduced by effectuation theory.	CONCEPTUAL
Mirvahedi and Pira (2020)	The authors investigated entrepreneurs' decision-making logic while entering foreign markets and found out that entrepreneurs tend to implement the effectuation approach in the early stages of entering the global market. Findings show that foreign-market entry in early stages is effectual and in later stages, as export activities develop in target markets, it tends more towards causation.	EMPIRICAL
Strauß, P., Greven, A., & Brettel (2020)	The authors outlined a conceptual model of how entrepreneurs' effectual behavior is shaped by collective identity under different levels of cultural conditioning (i.e., national cultural values). Based on a survey of 235 Thai and German entrepreneurs, authors analyzed the impact of Hofstede's cultural dimensions of power distance, individualism, masculinity, and long-term orientation on the relationship between collective identity and effectuation. Results show that national culture is dispositive for the causal effects of collective identity on effectual behavior and entrepreneur's effectual behavior differs due to their national cultural conditioning.	EMPIRICAL
Wu, Liu, and Su, (2020)	The authors argue that effectuation differentially affects two types of new product advantages, namely new product development (NPD) speed and new product quality (NPQ) They found out that effectuation is positively related to NPD speed but has an inverted U-shaped relationship with NPQ.	EMPIRICAL

Counterfactual Thinking

"Look in my face; my name is Might-have-been; I am also called No-more, Too-late, Farewell."

—Dante Gabrielle Rossetti

According to Roese (1997), "counterfactual" refers to being contrary to the facts. Counterfactual thoughts represent "alternative versions of the past" where the individual compares their current circumstance to some envisioned worse (downward counterfactual), or better (upward counterfactual) outcome (Roese, 1997, pp. 133–134). During the process of counterfactual thinking, individuals start to alter some occurrences of the past and evaluate the possible consequences that they could reach by changing their actions or decisions. In fact, individuals try to learn what other possible outcomes they could achieve if other choices would have been made. Therefore, counterfactual thoughts are the alternative versions of the past within which established antecedents are being falsified (Goodman, 1947). In this case scholars argue that the consequences may or may not be falsified. In other words, the alteration of other possible antecedents may not necessarily result in an alternative outcome.

In general, there are different approaches toward counterfactual thoughts, some scholars argue that these thoughts are harmful, others indicate that these thoughts can be utilized positively to create interesting outcomes. Table 3 summarizes most important articles regarding the positive and negative perspectives toward counterfactual thinking.

Table 3: Counterfactual thoughts: Good or Bad?

Perspective	Scholars
Counterfactual thoughts are harmful.	Sherman & McConnell, 1995
Counterfactual thoughts are beneficial.	Roeses, 1994
Counterfactual thoughts are both harmful and beneficial. but the net result is an overall benefit for the individual.	Roese, 1997

Counterfactual thoughts are classified based on their direction of comparison. This means that counterfactuals may be upward – assessing an alternative to be better than an actuality – or downward – assessing the alternative to be worse than the actual situation (Markman et al., 1993; McMullen et al., 1995; Roese, 1994, 1997).

A review of the literature on psychology shows that counterfactual thinking has been an important subject under study for decades (Arora et al., 2013). The majority of arguments made in the field of counterfactual thinking indicate that counterfactual thoughts are mostly activated by individuals' emotions, either negative or positive. These thoughts, if activated by negative affect, come to mind in response to an unfavorable outcome. In that moment the individual tries to build up his/her corrective thinking and gets involved in the thoughts of "What might have been" (Roese, 1997, p. 133). Therefore, negative emotions come to place and the individual grows regretful about actions or behaviors in the past. However, positive emotions may also follow such negative emotions and the individual may feel hopeful about finding paths to fix the outcome in a favorable manner.

According to entrepreneurship literature, counterfactual thoughts can result in higher levels of learning through content-specific pathways or content-neutral pathways. In content-specific pathways, if information regarding the actions that could have been taken gets transferred to behavioral intentions, learning occurs. In content-neutral pathways, learning occurs through production of an indirect effect on individuals' feelings, outlook, or motivation. In fact, in content-neutral pathways a more general style of information processing or motivation to expend greater effort results in behavioral change.

In addition to these two approaches that can result in higher learning by entrepreneurs (Epstude & Roese, 2008), Roese and Summerville (2005) indicate that people's biggest regrets

lie in life occurrences within which they see their largest opportunities, and they believe they had the freedom of choice. After receiving unfavorable outcomes, individuals go through a stage of recall and might remember a past experience regretfully. However, these regrets create tangible prospects for change, growth, and renewal. Therefore, experiences such as new venture failure or setbacks in a venture can result in higher achieved learning by entrepreneurs (Yamakawa et al., 2015) through a process of counterfactual thinking (Roese and Summerville, 2005).

Although emotions and cognition have significant influence on the existence of counterfactual thoughts (Epstude & Roese, 2008; Roese, 1997), scholars also relate the existence of these thoughts to the individual differences such as personality characteristics (e.g., neuroticism, optimism, or agreeableness) (Kasimatis & Wells, 1995; Sanna, Carter, & Small, 2006), and dispositional attributes of the entrepreneur (Arora et al., 2013). Allen et al. (2014) assert that personality characteristics and dispositional attributes (e.g., self-efficacy, neuroticism) can identify the direction of counterfactual thoughts whether it is upward or downward. They also concluded that intensity, duration, and/or overproduction of negative emotions can result in significantly higher upward counterfactual thinking.

Some scholars also found opposite relationships between counterfactual thinking and entrepreneurial self-efficacy, actions, and outcomes (Hmieleski & Corbett, 2008; Markman, Baron, & Balkin, 2005; Zhao, Seibert, & Hills, 2005). For example, Markman, Balkin, and Baron (2002) studied the investors of a new business and found out that this group tends to have higher self-efficacy related to the task, but also more intense counterfactual thoughts. In a separate study, the same authors reported that entrepreneurs experience a greater number of regrets with higher intensity, concurrently with higher levels of perseverance and self-efficacy

compared to non-entrepreneurs (Markman et al., 2002). Arora et al., (2013) argued that such inconsistency is due to the existence of variable dispositional attributes of the entrepreneurs.

Barnett and Martinez (2015) compared the concepts of optimism/pessimism to downward/upward counterfactual thinking and asserted that optimism and pessimism are cognitive expectancies regarding future events, whereas counterfactual thinking is the cognitive process of imagining alternatives to events that occurred in the past. Barnett and Martinez (2015) found out that downward counterfactual thinking (imagining how things could have been worse) was associated with optimism and that upward styles of counterfactual thinking (imagining how things could have been better) were associated with pessimism. Finally, they suggested that thinking about past events is consistent with expectations about the future.

Markman and Miller (2006) included the concept of control to the study of emotion and counterfactual thinking and indicated that individuals' severe depressive symptom levels generate counterfactuals that are more uncontrollable, less reasonable, and more characterological in nature than those generated by less depressed individuals. They concluded that controllable counterfactual thinking enhances control perceptions for less depressed individuals, but reduces control perceptions for those who are highly depressed. Studies also indicate that counterfactual thinking improves entrepreneurial alertness which results in better reasoning and opportunity identification abilities (Gaglio and Katz, 2001).

The review of the literature shows that counterfactual thinking has considerable influence on decision-making and learning through impacting an individual's emotions and cognitions. In chapter 3, I will make arguments regarding the impact of counterfactual thinking and its relations to effectuation, learning, and the decision to exit the market.

Entrepreneurial Biases

While the rationality of entrepreneurial decision-making has been widely discussed in economic models, scholars admit that decision-making might just partially follow rationality or specific conditions. In the majority of situations, entrepreneurs' heuristics and biases help them to make decisions (Busenitz and Barney, 1997; Kaish and Gilad, 1991; Manimala, 1992; Palich and Bagby, 1995). In this section, I first define what bias is in general terms and then I explain how entrepreneurs' biases impact decision-making. A review of the literature on entrepreneurial biases is provided to clarify how holding these biases can benefit or harm the entrepreneurs.

Bias is defined as "the systematic deviation from rationality or norms in judgment and decision-making" (Zhang & Cueto, 2015, p.2). Instead of making decisions based on rational choice theory, biased individuals choose actions and estimate probabilities (Baron, 2008; Tversky & Kahneman, 1974). Cognitive research suggests that decision makers tend to develop a set of decision rules and biases to explain the random events in their lives and these biases – also referred to as decision rules, cognitive mechanisms, and subjective opinions – assist individuals in making decisions (Busenitz, 1999).

The study of heuristics and bias dates to 1973 when cognitive psychology scholars began to interpret bias and find the reasons why it occurs when individuals make decisions (Zhang & Cueto, 2015). Study of bias in the field of entrepreneurship, later on, became a widespread phenomenon and attracted the attention of many scholars to the field. Although research in the field of psychology indicates that all individuals are subject to bias while making decisions, research in the field of entrepreneurship shows that entrepreneurs hold higher levels of bias than do other individuals, even managers of established firms (Busenitz & Barney, 1997; Bercovitz et al., 1997; Sarasvathy et al., 1998). Therefore, one can conclude that biases highly permeate

decisions in entrepreneurship. The entrepreneurship literature, on the other hand, has held the debate about whether bias is a positive and helpful phenomenon. Some scholars refer to bias as errors (Tversky & Kahneman, 1974) due to being destructive, whereas others refer to non-rational bias as simplifying strategies (Kahneman, Slovic, & Tversky, 1982) to make decisions in an effective manner (Busenitz, 1999). Researchers also argue that if it is a harmful phenomenon, great ventures could not be founded under the conditions of biased decision-making (Stanovich and West, 2008). This group of scholars holds the belief that without these shortcuts – biases – decision makers are not able to deal with unresolved uncertainty. It is important to note that although there are pros and cons to carrying these biases, circumstances in which the biases evolve can make a difference in the associated outcomes. For instance, under the conditions of uncertainty, complexity, and ambiguity, biased individuals would make better decisions (Busenitz, 1999; Gigerenzer & Gaissmaier, 2011). Bias helps the individuals to make shortcuts. For instance, an overconfidence bias may help an individual to take action in pursuing an opportunity and as a result he or she may benefit from being a first-mover. Illusion of control may help individuals to take risky actions and explore novel ideas without fear of failures. Biased individuals are able to react faster to uncertainty. In general, heuristic-based decision-making empowers individuals to merge fragmented information and integrate them based on decision rules (Eisenhardt, 1989) and, by providing intuitive guidelines, helps individuals to accelerate decision-making (Tversky & Kahneman, 1974).

Entrepreneurship literature has identified 11 types of biases that influence entrepreneurial decision-making: overconfidence, over optimism, self-serving attribution, illusion of control, the law of small numbers, similarity, availability, representativeness, status quo, planning fallacy, and escalation of commitment. All of these biases have substantial influence on entrepreneurial

decision-making and it is not an easy task to prioritize them. In fact, depending on the questions under study, each one of these biases can have significant influence on the results. Regardless of this fact, scholars in the field of entrepreneurial decision-making have overwhelmingly focused on two biases of overoptimism and overconfidence more than the others.

In the current research, I will study how two biases of escalation of commitment and illusion of control impact the entrepreneurial learning and exit decisions. There are a number of reasons why I have selected these two biases as the most influential biases on the underlying relationships of my study. First, this study has two dependent variables and one is the likelihood of exit. This dependent variable can be highly influenced by escalation of commitment bias and may prevent entrepreneurs from exiting the market, even if this is time for them to exit. Illusion of control, similarly, can prevent the entrepreneurs from making closure decisions since they might think they have control over the situation and they can help their new ventures to survive. Second, illusion of control can prevent entrepreneurs from learning since they may stick to previously chosen solutions, and they may hold the belief that their abilities are enough to take control over the firm without adjusting any behaviors. Third, effectuation helps the individuals to keep an open mind and to stay flexible if uncertainties appear. As a result, illusion of control can diminish the positive impact of effectuation on entrepreneurs' flexibility.

Considering these reasons, compared to other types of biases, illusion of control and escalation of commitment seem to have a significant impact on entrepreneurial decisions. In fact, illusion of control and escalation of commitment seem to be more appropriate for the context and domain of my study than other entrepreneurial biases and are very likely to explain the proposed relationships due to the aforementioned reasons.

Illusion of control works as barrier to exit the business by empowering the entrepreneur to take control even if it is not real, and escalation of commitment is likely to weaken the possibility of exiting the business.

Before I talk more about the two biases under investigation, I briefly review the remaining biases not included in this research to make a comparison among these biases and the selected ones and to help the readers to understand why escalation of commitment and illusion of control are evaluated to have a stronger impact on dependent variables of my study than other entrepreneurial biases.

"Overconfidence" as a widely-recognized context in entrepreneurship (Busenitz & Barney, 1997; Cooper, Woo, & Dunkelberg, 1988; McCarthy et al., 1993) and one of the most commonly referenced decision-making biases (Schwenk, 1988) is generally defined as ''the positive difference between confidence and accuracy'' (Schaefer, Williams, Goodie, & Campbell, 2004: p. 473). Scholars argue that overconfidence occurs when individuals tend to overestimate their ability to obtain information about an issue even if they are relatively unfamiliar with the topic (Busenitz, 1999).

Moore and Healy (2008), in their seminal review, found that overconfidence has been defined in three different ways in the literature. In order to measure overconfidence, some scholars have focused on "overestimation of one's actual performance". Another group of researchers asserted that overconfidence is "overplacement of one's performance relative to others", and finally, the third group indicated that overconfidence is the "overprecision of one's beliefs".

Others suggest that it is best to incorporate the three definitions mentioned here to conceptualize and measure overconfidence (Zhang and Cueto, 2015). Empirical evidence shows

that entrepreneurs reveal significantly greater levels of overconfidence than do managers of established firms (Busenitz and Barney, 1997). One of the issues with overconfidence is that individuals who have this bias usually make decisions based on incomplete information without believing such imperfection exists (Busenitz, 1999).

Overconfidence and illusion of control seem to have similar impact on the entrepreneurs' decisions to stay in the market. However, the main difference between these two biases is that individuals with illusion of control believe that they can even control the chance-based situations while overconfidence is more related to the abilities of the individual.

"Overoptimism" also can act similar to illusion of control and overconfidence. This bias occurs when individuals overestimate the possibility of positive events and underestimate the probability of negative ones (Sharot, 2011). According to Zhang and Cueto (2015), overoptimism overlaps with overconfidence; however, the main characteristic that makes these biases distinct is the fact that overconfidence refers to the self-assessment of capabilities and the individual cannot be overconfident about external entities while he/she may be overoptimistic about the outcomes of those external entities. According to Lowe and Ziedonis (2006), unlike the belief that overoptimism critically impacts the decision to start a new venture, this bias is not a determining factor for founding a business, rather, entrepreneurs with high levels of overoptimism are more likely to continue unsuccessful effort. Compared to overoptimism and overconfidence, the two biases of escalation of commitment and illusion of control are related to negative thoughts. In my proposal, existence of constructs such as critical setbacks experiences, fear of failure, and counterfactual thinking simulates the negative atmosphere that entrepreneurs are likely to deal with. Therefore, illusion of control and escalation of commitment have stronger contribution to my research compared to the remaining entrepreneurial biases.

The third entrepreneurial bias is "self-serving attribution" which is defined as a tendency to attribute positive outcomes to the individual's internal characteristics and negative outcomes to external factors (Miller and Ross, 1975; Rogoff, Lee, & Suh, 2004). This bias involves overestimating the extent to which internal characteristics (skill and effort) versus external characteristics (luck and task difficulty) are contributing factors to better performance (Libby and Rennekamp, 2012).

The fourth bias is "the law of small numbers" which explains how individuals may make conclusions for a large population based on very limited number of samples (Haley and Stumpf, 1989). This bias appears when an individual uses a limited number of informational inputs (a small sample of information) to draw firm conclusions (Hogarth, 1981; Tversky and Kahneman, 1974). In the field of entrepreneurship, too much focus and reliance on a small sample which may not represent the population as a whole cause the individuals to overlook the 50% failure rate of new ventures by ignoring the major portion of the samples (Cooper, Woo, and Dunkelberg, 1988).

The fifth entrepreneurial bias, representativeness, causes the individual to draw conclusions and make decisions by implementing cognitive shortcuts based on familiar situations (Wadeson, 2006). Busenitz (1999) interprets representativeness as a similar phenomenon to the law of small numbers. He argues that unlike the law of large numbers suggesting that large random samples should be used to achieve rigor about population statistics, representativeness proposes that individuals tend to make decisions based on small, nonrandom samples such as personal experience and pay less or no attention to the majority.

"Similarity" bias causes entrepreneurs to evaluate those who are more similar to them more positively compared to those who are different (Byrne, 1971; Byrne & Griffitt, 1973). The

social psychologist Byrne (1971) proposed a "similar-to-me" hypothesis to describe this bias. Byrne (1971) explained this phenomenon based on learning theories which indicate similarities are rewarding while dissimilarities are negative reinforcements. In addition, based on self-categorization theory, individuals tend to believe that they have positive identity therefore they consider the categories to which they belong as a positive entity too (Turner et al., 1987).

The "Availability" heuristic causes individuals to make judgments about the probability of events by employing a limited number of heuristics, which reduces the difficulty of the task. In this case, the probability of an event is generated based on the ease of examples that the individual can think of rather than logical or statistical implications (Tversky and Kahneman, 1974). Tversky and Kahneman (1974) used the example of divorce rate and proposed that one may assess the divorce rate in a given community by recalling divorces among one's acquaintances (easy examples). This is when the availability bias appears.

"Status quo" refers to the tendency to repeat a previous choice overly often (Samuelson & Zeckhauser, 1988). This bias indicates that instead of considering all available information in the decision-making process, individuals prefer to rely on what they have selected in the past or what someone else has chosen for them.

"Planning fallacy" is defined as the tendency to hold a confident belief that a task or project will proceed as planned, even though the individual knows that the vast majority of similar projects have run late (Kahneman & Tversky, 1979). In other words, individuals may tend to underestimate the time needed for future tasks and hold the belief that they will accomplish the goal.

Each one of these biases has significant impact on entrepreneurial decision-making. In fact, existence of bias, as a general term, can influence the way individuals – or more specifically

"the entrepreneurs" – analyze their surrounding environment or the information they possess. As I mentioned earlier, many of these biases have been already investigated extensively. In addition, due to a number of reasons provided in this section of my literature review, illusion of control and escalation of commitment are particularly relevant biases related to entrepreneurial decision to exit the business. My research proposal is based on the feeling of failure and the cognition processes that triggers the feeling of failure which in return leads the entrepreneurs toward making a decision to exit. Escalation of commitment and illusion of control seem to be the most challenging biases of the entrepreneur. Escalation of commitment prevents the entrepreneur to exit, it may result in allocation of more resources and illusion of control may cause the entrepreneur not to believe that he is losing control over a difficult or loss situation. Therefore, these biases are likely to prevent the entrepreneur from making an exit decision.

I hope the provided brief explanation on other entrepreneurial biases helps the reader to gain a deeper understanding of why escalation of commitment and illusion of control have been chosen and to make the comparison between the selected and unselected biases easier for the purpose of this study. Following, I have included a deep literature review on illusion of control bias and escalation of commitment.

Illusion of Control

Psychologists have long been concerned about the influence that perception of control creates on individuals' life events and behaviors. Individuals attempt to acquire freedom through exercising control and struggling against randomness (Burgers, 1975; Perlmuter and Monty, 1977). Glass and Singer (1972) suggested that the predictability of life events diminishes individual needs to take control of their environment. Through taking the control over uncertain situations, individuals strive to demonstrate their superiority to others (Adler, 1956) and to gain

competence (White, 1959). In fact, the perception of control over events or other humans makes individuals believe that they are better or more powerful than others (feeling of superiority) and they become more competent because of this feeling. When the illusion of control bias exists, the feeling of superiority and competence that individuals hold remains illusory and would not reflect the reality of the individual. Therefore, decision-making would be biased since the individual holds the superiority belief and the outcomes of his/her decisions may not be truly controllable.

In 1975, Langer introduced the concept of illusion of control bias and defined it as "an expectancy of a personal success probability inappropriately higher than the objective probability would warrant" (Langer, 1975, p.313). Illusion of control occurs when individuals hold a fallacious belief about their control over uncontrollable events and regard themselves as causal agents in gaining chance-based outcomes (Cowley et al. 2015, Langer, 1975). Individuals holding illusion of control bias think that their skills can influence the outcomes even if the outcome is a matter of luck and randomly determined. These individuals do not always distinguish between chance and skill-determined events due to two main reasons: first, their motivation to control events, and second, a lack of discrimination between these types of events, given an element of chance in every skill situation and an element of skill in chance situations (Langer, 1975).

The study of illusion of control has a long history in the study of gambling. Scholars in this field assert that the majority of gamblers carry the illusion of control bias by showing a strong desire to predict the results. These researchers argue that gamblers believe that their predictive abilities can determine what the outcome is better than other gambles at the same table.

Presson and Benassi (1996) conducted a meta-analysis and found that there is an issue with the conceptualization of illusion of control in the studies. In other words, those who have targeted the concept of illusion of control have investigated two different concepts: illusion of control and illusion of prediction. Cowley et al. (2015) note that gamblers think they can predict the outcomes better than other gamblers. Therefore, rather than controlling, these individuals try to predict the outcomes. Presson and Benassi (1996) further offered the use of the term illusory judgment as an alternative to illusion of control/prediction.

Locus of control as one of the most important contributing factors to illusion of control indicates that individuals vary in their expectancies regarding their ability to control events affecting them and their tendencies to attribute the causes of their successes or failures to either internal or external sources (Hong & Chiu, 1988). Those with an internal locus of control have high expectancies of their ability to control events and they attribute success or failure to themselves. Those with an external locus of control have low expectancies of control and attribute success or failure to external sources, such as specific situations, other people, or fate (Rotter, 1966).

Literature review in the field of illusion of control indicates that, in addition to situational factors that affect the level of illusion of control, other elements such as high external locus of control (Hong & Chiu, 1988), desire to control life events (Burger & Cooper, 1979; Burger & Schnerring, 1982), and high self-esteem (Taylor & Armor, 1996; Taylor & Brown, 1988) enhance the illusion of control bias. The desire to improve the feeling of self-worth increases the level of illusion of control in individuals in order to keep them optimistic (Thompson et al., 1998). In fact, individuals have a high tendency to prevent situations in which their self-worth is threatened or questioned. Overemphasis on the feeling of self-worth causes the individuals to

think that they have control over even uncontrollable situations. A reluctance to doubt their self-worth due to lack of control results in illusion of control bias.

In addition, studies show that existence of illusion of control causes the individual to believe that even luck is a personal quality rather than an uncontrollable event (Wohl and Enzle, 2002, 2003, 2009). Therefore, individuals may mistakenly believe that they have control over any uncontrollable or chance-based situations. Biner et al. (2009) conducted an experiment that indicated the need to avoid an outcome can influence the level of illusion of control. These scholars found that the need to avoid a randomly-determined averse outcome improves individuals' perceptions of the level of skills they require to influence the outcome. In other words, when individuals need to avoid an outcome or they have a strong desire to win a game such as dice throwing, they begin to believe that their skills can change the results. This whole process in turn creates the illusion of control.

Research in the field of entrepreneurial biases determines that illusion of control can be both adaptive and maladaptive. For instance, Taylor and Brown (1988) note that individuals carrying an unrealistic optimism can better cope with stressful situations, and this can be gained through the illusion of control. Scholars in the field of psychology argue that illusion of control helps an individuals' well-being by protecting them from negative emotional states and thoughts and shields them from unpleasant feelings (Alloy & Clements, 1992).

Scholars also found that depression negatively influences illusion of control (Benassi & Belli, 1989). In 1992, Alloy and Clements conducted a study to investigate the reverse of this relationship and find out whether the illusion of control influences the feeling of depression. Interestingly, these researchers determined that illusion of control decreases the likelihood of showing immediate negative mood reactions and becoming discouraged after the occurrence of

negative life events. For instance, gamblers with strong illusion of control often report fewer negative feelings toward loss experiences compared to those with low levels of illusion of control.

In the same vein, Cowley et al. (2015) concluded that the negative relationship observed in previous research between feelings of depression and strength of illusion of control can explain the benefit of having illusion of control. In general, illusion of control, as a form of perception of control over outcomes, seems to moderate the negative influence of life events and to reduce the likelihood that an individual becomes discouraged. So, the impact of stressors will become less important in the mind of the individual and instead he/she keeps the belief that these stressors are preventable.

Illusion of control has been considered as a double-edged sword. While it can protect the individuals from negative feelings and mood such as depression, it may create a blind spot and hide reality in such a way that the person may insist on doing what is not recommended to be done. Therefore, the person is likely to continue implementing the previously chosen strategies or behaviors due to a deep belief in their skills. Excessive or pathological gambling is a good example showing how illusion of control can negatively influence individuals and cause them to make wrong decisions (MacKillop et al., 2006; Steenbergh et al., 2002).

Individuals may also carry the illusion of *lack of control*. It means that they might have the control over the situation but their perception about control may opposite the fact that they can control a situation. Therefore, they expand the illusion that they do not have control over the situation. Accordingly, they may make wrong decisions by easily giving up on their goals since they do not consider themselves capable of creating outcomes. Rather, this group of individuals may believe that external factors or luck determine what they can achieve. Accordingly,

entrepreneurs with high illusion of control can benefit from this bias by insisting on achieving the outcomes and goals they set since they believe they are the only influences on an outcome. Entrepreneurs – like other individuals – might also be in trouble because of illusion of control bias; they may not perceive facts properly and they may not recognize they are not in control in specific situations. Therefore, they may insist on taking wrong courses of action.

Escalation of Commitment

Escalation of commitment is defined as the tendency of an individual to persist with failing courses of action while making decisions (Brockner, 1992; Staw, 1981, 1997). This definition focuses on an intended commitment to failing courses of action even when outcomes are quite negative.

Over the past four decades, the topic of escalation of commitment has intrigued organizational scientists. Scholars in this field have tried to identify the reasons why escalation of commitment takes place and what its possible antecedents and theoretical foundations are. Table 4 briefly summarizes most contributing studies in the field of escalation of commitment.

The study of escalation of commitment is extremely important in decision-making. The reason lies in the fact that many of most difficult decisions an individual must make are choices about whether to commit to a course of action, rather than about initiating an isolated course of action (Staw, 1981). When individuals consider a questionable line of behavior, they may decide either to cease the course of action or to commit more effort or resources to change the outcome in a positive way. The reasons why escalation of commitment occurs follow.

The most important reason for this phenomenon is explained by expectancy theory, which describes a process whereby individuals assess the probability of reaching target with more resources. After developing more resources, they develop a tendency to insist on

continuing with courses of action and previously-made decisions. In fact, decisions makers often try to achieve favorable outcomes and survive by allocating more resources – money, time, and energy – whenever they receive negative feedback, signs of failure, or unfavorable results (Staw, 1981, Brockner et al., 1984; Brockner, Houser, Birnbaum, Lloyd, Deitcher, Nathanson, & Rubin, 1986).

Another reason for escalating behavior refers to self-justification, a tendency to prove prior decisions. When a decision seems to be problematic due to unfavorable outcomes, the decision maker insists on the decision since he/she does not want to look wrong (Staw, 1981).

Prospect theory gives the third reason for escalation of commitment. When individuals find themselves in the domain of loss they become more risk-seeking and when they find themselves in the domain of gains, they become more risk averse (Alchian & Allen, 1977; Brockner, 1992; Kahneman & Tversky, 1982; Wennberg, Wiklund, DeTienne, & Cardon, 2010)

Hsieh et al. (2015) argue that escalating commitment scenarios are threefold – poor prior performance, subsequent commitment decisions, and uncertainty regarding the chance of future success – without which it is not possible to distinguish other phenomena like inertia (Briscoe & Tsai, 2011; Kumar, 2004) from escalation of commitment. Rather than considering escalation of commitment as an individual phenomenon, it should be identified as a process which influences decision-making. Scholars have also referred to other elements that are likely to trigger the escalation of commitment, such as the tendency to intensify the value of future returns to cover past losses or to attribute the reasons for failure as exogenous (Staw, 1981). Decision makers may believe that the costs of a failing project can be passed on to others (Zardkoohi, 2004). Lack of negative feedback regarding decision makers' prior actions can be another reason for escalating behavior (Decision dilemma theory; Brockner, 1992).

Table 4: Escalation of Commitment in a Glance

Author(s)	Contribution on Escalation of Commitment	Type of the study
Staw, 1981	Escalation of commitment is triggered by other biases like self-justification. In this situation, the individual follows a retrospective rationality by being competent about the past and not about the future. Another bias escalating the commitment is to intensify the value of future returns to cover the past losses. In addition, recognizing the cause of failure as exogenous rather than endogenous can also trigger escalation of commitment since the individual tries to recoup his/her losses. Here escalation of commitment is accompanied with selective ignorance of information.	CONCEPTUAL
Brockner, 1992	The article summarizes that there are two main interpretations for escalation of commitment, one based on expectancy theory which explains that some individuals assess the probability of reaching the target if more resources are allocated. The second interpretation is related to self-justifying or rationalizing behavior. In this second category, decision maker is unwilling to admit prior mistakes and instead, persists with those decisions. Other theories have contributions to escalation of commitment, such as prospect theory assuming that when individuals see themselves in the domain of losses, they become more risk seeking and continue allocating more resources. Decision dilemma theory, on the other hand, explains that individuals who do not receive negative feedback regarding prior decisions are less likely to adjust their behavior and therefore remain motivated to make the same decisions.	CONCEPTUAL
Zardkoohi, 2004	The paper studies the contexts in which escalation of commitment is likely such as the situation in which high costs of a failing project can be passed onto others outside the decision maker's organization or when there is a large number of firm-specific human capital (manager/decision maker). Tragedy of the commons, occupational justifications, and prospect theory are considered as three frameworks for studying escalation of commitment.	CONCEPTUAL
Sleesman et al., 2012	The authors conducted a meta-analysis and found that (1) having explicitly chosen a failing course of action may result in no higher levels of escalation than having been merely assigned responsibility for such a choice; (2) the prominence of sunk costs was lower than expected; (3) opportunity cost salience can lead to de-escalation in some situations but escalation in others; and (4) the sharing of decision authority may lead to greater levels of escalation.	EMPIRICAL
Hsieh et al., 2015	The authors argue that tendency to escalate commitment is a result of being compared to competitors. While mimicking the actions or successful strategies of other organizations, companies believe that they can also succeed regardless of their poor performance, as a result escalation happens. The paper argues that despite the existence of pro-commitment biases, it is less probable that firms escalate their commitment while facing poor performance, instead, escalation occurs as a result of being compared to rivals. In addition, the size of the competitor is influential.	EMPIRICAL

Failure in Entrepreneurship

Defining Failure

While the value and importance of entrepreneurship to economic development, job creation, and innovation is well recognized (Carree & Thurik, 2010; Lee, Yamakawa, Peng, & Barney, 2011), the majority of entrepreneurial firms do not survive and vanish within a few years of being founded regardless of the high levels of optimism and hope that the founders hold before creating the venture (Cooper, Woo, & Dunkelberg, 1989; Headd, 2003; Knott & Posen, 2005; Peng, Yamakawa, & Lee, 2010; Wiklund, Baker, & Shepherd, 2010). Among the survivors, a small proportion reaches the desirable outcome and considers themselves as "successful". The remaining ones face the challenge of surviving and persist under environmental uncertainty and threatening conditions (DeTienne et al. 2008).

Well-established theories in the field of organizational research such as population ecology (Hannan and Freeman, 1977) assert that underperforming organizations will be selected out of the environment and this process is called natural selection. According to this perspective, organizations with poor performance are unable to adapt to environmental contingencies and are not able to deal with uncertainties. Therefore, during a natural selection process, the underperforming organizations will disappear. The natural selection process can partially explain the deaths, births, change, and growth of organizations in an environment. According to this perspective, firms that have a close fit with the environment survive, while those that do not fit disappear. Although this view can explain a great proportion of organizational death, it can be confusing since it does not differentiate various types of organizations' disappearance.

Research shows that new ventures are the primary engine of job creation in the U.S. economy (Birch, 1987). Due to important role of new ventures in creating jobs and enhancing the economic growth, scholars have paid substantial attention to the outcomes of new ventures and have listed three outcomes as the main outcomes of a new venture. These outcomes could be: failure, marginal survival, or high growth (Cooper, Gimeno-Gascon, & Woo, 1994).

Among these, failure is the most common outcome of new ventures (Shapero, 1982; Yamakawa, Peng, & Deeds, 2015). Marginal survival, as the second outcome, can differentiate a "failed organization" from a "failing organization". Marginal survival can represent under-performing firms that may get credit for survival while they are following a downward trend in terms of their performance.

McGrath and Cardon (1997) note that underperforming organizations cannot represent reasonable returns in the free market, therefore they produce negative impact on the economic system, industry, and stakeholders. These organizations impose uncertainty for venture capitalists, suppliers, customers, distributors, competitors, and employees (Karakaya, 2000; Ruhnka et al., 1992) and evacuate resources and occupy market positions.

Scholars in the field of entrepreneurship have defined organizational failure in a number of different ways over decades. For instance, entrepreneurship literature has enumerated different forms of failure as bankruptcy, exit, closure, decline, discontinuance, and death of the organization (McGrath, 1999; Shepherd, 2003; Watson & Everett, 1996; Zacharakis, Meyer, & DeCastro, 1999). Existence of these different forms indicate that researchers have different perspectives regarding the phenomenon of failure. While bankruptcy shows organization has not been profitable, exit might refer to a personal decision even if the organization is profitable.

From the perspective of an entrepreneur, success and failure could be subjective. These types of closures, exits, and discontinuance, if chosen voluntarily, would not be necessarily considered as failure by the individual entrepreneur. In fact, entrepreneurs may decide to close the new venture due to personal reasons and preferences that are not necessarily related to poor performance of new venture. In this case, the venture has not failed; rather, the entrepreneur has voluntarily decided not to continue.

Ucbasaran et al. (2013, p.166), in their comprehensive review of the literature, indicated that definition of failure ranges from "broad (discontinuation of ownership) to less permissive (discontinuation of the business) to narrow (bankruptcy) definitions". Defining business failure as discontinuity of ownership is related to all the businesses which either have been closed or have been sold due to personal preferences such as retirement (Singh et al., 2007). Defining failure as bankruptcy relates to poor economic performance (Shepherd and Haynie, 2011). Shepherd (2003) argued that poor performance cannot be separated from discontinuance of business and it is the combination of both that creates failure. He, further explained that failure occurs when a business does not survive due to poor performance and lacks the capability to compete in the market.

Since failure can be a result of poor performance, it is important to identify what poor performance means. Performance is poor when the outcome of the business does not meet the market needs. However, it is also possible that the entrepreneur's subjective evaluations of the performance rate the performance as poor even if it does meet the market demands. Therefore, the expectations of the entrepreneur form another scale to assess the venture's performance. In other words, though performance still suffices to remain in the market, the business closes

because the performance does not meet the expectations of the entrepreneur (Ucbasaran et al., 2010).

In order to study failure in the field of entrepreneurship, scholars have referred to four different failure-related phenomena as follows: experience of failure (e.g., Cardon & McGrath, 1999; Minniti & Bygrave, 2001; Shepherd, 2003), perception of potential failure (related to experience of critical setbacks) (e.g., Politis and Gabrielson 2009), fear of failure (e.g., Cacciotti and Hayton, 2015; Morgan and Sisak, 2016), and learning from failure (e.g., McGrath, 1999; Minniti & Bygrave, 2001; Mueller and Shepherd, 2016; Sitkin, 1992; Yamakawa et al., 2015). In the next four sections of this chapter, I interpret each one of these concepts and explain how they differ from each other. My study is the first to investigate all of these failure-related phenomena in one place. Except past failure experiences, which is one of the control variables of my study, the other three are moderators. In chapter 3, theoretical development, relationships of these moderators are explained in detail.

Past Failure Experiences

As I discussed in the previous section, failure occurs when performance is poor and the entrepreneur decides to terminate the business. Many entrepreneurs have this experience and have been involved in the process of business closure in their previous venture. “Experience of failure” refers to failure that is actualized in the past. This concept has been widely studied in the field of entrepreneurship in order to explore how it can influence entrepreneurial learning. Studies show that some second-time (as opposed to first-time) ventures lead to greater success (Kawakami, 2007) and it can be attributed to the experience of failure. As Henry Ford states failure is “[an] opportunity to begin again more intelligently.” In fact, founders by losing their ventures, gain a post-failure learning opportunity (Cardon & McGrath, 1999; Minniti & Bygrave,

2001; Shepherd, 2003) and develop knowledge and skills that help them to be successful in their subsequent venture creation (Baron, 2004; McGrath, 1999; Minniti & Bygrave, 2001; Sitkin, 1992).

Critical Setback Experiences

Although the discussion on the experience of failure relates to the actual occurrence of failure, perception of failure refers to the phenomenon wherein failure has not occurred; however, its likelihood influences the individual's behavior. Unlike the actual experience of failure, perception of failure does not indicate that failure is real or its occurrence is certain but the entrepreneur perceives it is highly probable. In this situation, the entrepreneur may try to rebound from hypothetical failure which is not yet certain; the perception of its likelihood may cause the individual to react to gain control and to save his/her new venture.

Entrepreneurs may also face a number of obstacles such as the lack of adequate information to provide a warning that a potential failure is likely to happen. These obstacles may also enhance fear of failure (Politis and Gabrielsson, 2009) and result in various entrepreneurial behavior. Some individuals may strive to work harder in order to prevent failure from occurring or, on the contrary, they may cease action. Cyert and March (1963) refers to such obstacles as critical setbacks that can trigger the pursuit of alternative and new solutions to a problem. In this situation, failure could be considered as a phenomenon likely to occur that the entrepreneur needs to address (Hill and Hlavacek, 1977).

Entrepreneurs who start up and manage new businesses often face a range of problems and obstacles. Politis and Gabrielsson (2009) refer to these obstacles as "critical setbacks". These obstacles provide a warning that a potential failure is likely to occur; therefore, they influence

entrepreneurial behavior. By experiencing critical setbacks in the process of creating and developing a new venture, entrepreneurs may decide to adjust their reactions in order to overcome the threat of potential failure.

Fear of Failure

Some scholars have focused on the fear factor of failure in the study of entrepreneurship. "Fear of failure" can influence the individual's decision-making and behavior throughout the entrepreneurial process (Cacciotti and Hayton, 2015; Morgan and Sisak, 2016). Fear of failure has been studied from different perspectives. Some scholars argue that fear of failure is risk aversion (Shinnar et al., 2012) and a barrier to entrepreneurship (Henderson and Robertson, 1999; Hatala, 2005; Bosma et al., 2007). Therefore, entrepreneurs who feel the fear to fail do not tend to take risks and start a venture. In fact, by producing negative effects, fear of failure inhibits entrepreneurial activities (Arenius and Minniti, 2005; Wagner, 2007; Langowitz and Minniti, 2007; Minniti and Nardone, 2007; Li, 2011; Patzelt and Shepherd, 2011).

Drawing on a social cognitive perspective on achievement motives, Kollmann, Stöckmann, and Kensbock (2017) found that individuals are influenced by the perception of obstacles. This perception activates and triggers their fear of failure and consequently produces a negative impact on their ability to exploit opportunities. They defined obstacles to be resource-based, market-based, or social-capital-based.

Resources-based obstacles are mostly related to the tangible and internal resources of a new venture. Resource-based obstacles appear when a new venture does not have required tangible resources or suddenly loses key resources. Market-based obstacles can be attributed to external market power, such as loss of customer demand that threatens the economic situation of

a new venture. In addition, sudden loss of an entrepreneur's important social ties of the entrepreneur can be considered another critical obstacle in founding new ventures, since social ties and personal networks benefit entrepreneurs by providing them with information, ideas, advice, and emotional support (Kollmann et al., 2017).

Kollmann and colleagues (2017) argue that existence of such obstacles activates fear of failure, which in return triggers an avoidance motive that inhibits individuals from pursuing opportunities, especially at the nascent phase of entrepreneurship.

On the other hand, scholars argue that fear of failure, as a combination of cognition, affect, and action (Mitchell & Shepherd, 2011; Morris et al., 2012; Sarasvathy, 2004; Cacciotti, Hayton, Mitchell, and Giazitzoglu, 2016), can also help the entrepreneur to progress in entrepreneurial activities, encourages motivation, and shapes opportunity recognition process (Mitchell & Shepherd, 2010; Wood, McKelvie, & Haynie, 2014). Fear of failure can influence the cognition of the entrepreneur by influencing the ability of the entrepreneur to process information and by changing the direction of his/her behavior. Fear as an affect can influence the entrepreneurs' emotions and may result in holding stress resulted from fear. Finally, fear influences the action of individuals through impacting their cognition and emotions,

Fearful individuals are likely to make more efforts in order to avoid failure and to succeed. In this situation, fear of failure works as "the motive to avoid failure" (McClelland et al., 1953; Atkinson, 1957; Elliot and Thrash, 2004; Elliot, 2006) and can push the individuals away from the situations in which there is probability of failure and help them to readjust their behavior.

In other words, fear of failure can both inhibit (Arenius & Minniti, 2005) and motivate (Ray, 1994; Mitchell, 1996; Mitchell & Shepherd, 2011; Morgan and Sisak, 2016)

entrepreneurial behavior. Some studies argue that fear of failure is similar to the perception of failure without considering that such fear can even exist before starting a business (Ekore and Okekeocha, 2012). Therefore, in this study, I differentiate the fear of failure from the perception of potential failure.

Learning from Failure Experiences

"Love the moment. Flowers grow out of dark moments. Therefore, each moment is vital. It affects the whole. Life is a succession of such moments and to live each, is to succeed"

—Corita Kent

In the fields of social psychology, organizational behavior, and entrepreneurship, past failure experiences have been widely considered to be important elements influencing individuals' subsequent actions, behaviors, and decisions to move forward. Studies in these fields have revealed that individuals use different mechanisms to react to failure experiences such as learning (Cope, 2011; Shepherd, 2003), self-efficacy (Yamakawa et al, 2010a, 2010b; 2015), persistence, escalation of commitment (Staw, 1981, Brockner et al., 1984; Brockner et al., 1986; Brockner, 1992), and grief/emotion (Shepherd, 2003).

Although all of these mechanisms play crucial roles in identifying how individuals take action after experiencing failure, the majority of studies have mainly focused on the mechanism of learning after failure and the process through which past failure experiences impact the development of knowledge and skills (e.g., Baron, 2004; Hastie, 1984; McGrath, 1999; Minniti & Bygrave, 2001; Mueller and Shepherd, 2016; Sitkin, 1992; Yamakawa et al., 2015; Zakay, Ellis, & Shevalsky, 2004) These scholars claim that learning represents a critical hub connecting failure and success (McGrath, 1999).

The potential learning benefits of failure are noted to be significant in the field of entrepreneurship, due to the large number of business failures (Singh, Corner, & Pavlovich, 2007). Recovery and re-emergence from failure seems to be helpful in facilitating higher-level learning outcomes through increasing the entrepreneur's level of preparedness for further entrepreneurial activities (Cope, 2011). Sitkin (1992) believes that failure is a prerequisite for learning since it helps the individuals to decode the reasons of failure and prevent repeating the same mistakes. Others also argue that failure results in learning by providing the opportunity for hypothesis testing and by facilitating the sense-making process of cognition (Louis and Sutton, 1991). In other words, failure works as a trial-and-error process and helps entrepreneurs to identify mistakes and this process allows them to make sense of future occurrences in the entrepreneurial journey.

Although failure experiences seem to enhance learning, they do not automatically lead to learning worthy of carrying forward (Cope, 2011). Individuals may learn the wrong lessons from failure, therefore not all lessons resulted from failure experiences may necessarily result in a successful subsequent entrepreneurial activity (Green, Welsh, & Dehler, 2003). Baumard and Starbuck (2005) claim that organizations mostly draw improper inferences from failure. Consequently, the learning which should be acquired following any failure experiences does not always occur or if it does, it can lead individuals toward learning the wrong lessons.

There are different reasons why failure experiences may not provide valuable lessons. First reason is that the ability of different individuals to learn from an outcome could be very different from one other individual and some individuals may learn valuable lessons while others may not (Shepherd, 2003). In fact, learning from past failure experiences is nuanced and a matter of cognition. Individuals have different cognitive mindsets. Accordingly, the lessons they learn

can change dramatically from one person to another. This is a result of experiencing identical challenges in life which in turn result in carrying identical mindsets (Yamakawa et al., 2015).

Inability to effectively confront what happened prevents some entrepreneurs from learning (Scott and Lewis, 1984). In fact, not all entrepreneurs are able to effectively and rapidly let go of what has happened in the past. They may get trapped in their negative feelings and their grief stage may take longer than it may take for other entrepreneurs and as a result they may not learn the valuable lessons from their failure experiences fast enough to implement the learning in a subsequent entrepreneurial activity. In addition, individuals may take into consideration the lessons they have learned in one situation and may apply them in other situations. However, some of the lessons learnt might have an inverse influence in a different setting or may lead the entrepreneur toward replicating the same mistake in the future (Baumard and Starbuck, 2005; Shepherd, 2003). For instance, while in one venture they might learn product differentiation can be beneficial, in other venture, early differentiation of the products can produce negative results and may accelerate failure.

It follows that the existence of different contributing factors such as an individual's cognition or the emotion of fear can help to either inhibit or facilitate the process of learning from past failure experiences. Politis and Gabrielsson (2009) referred to the individual's attitude toward failure as an important factor to the process of learning from failure. They explain that the individual's willingness to learn from failure is enhanced by their positive attitude. Such a positive attitude helps the individuals to protect themselves from repeating the same mistakes (Cannon and Edmondson, 2005) and to find new opportunities while improving their learning techniques (Sarasvathy, 2001a). Holding a negative attitude toward failure, on the other hand, diminishes the ability of the individuals to make sense of failure experiences and weakens the

ability to deal with a similar setback (McGrath, 1999; Shepherd, 2003). In order to answer the question of why some entrepreneurs develop a more positive attitude towards failure compared to others, Politis and Gabrielsson (2009) indicated that attitudes are primarily learned and this mechanism occurs throughout an entrepreneur's life and work.

Critical career experiences such as prior start up experience and business closure experience are another contributing factor to entrepreneurs' positive learning attitudes toward failure. Such experiences help the entrepreneurs to hold more positive attitudes towards failure, because these individuals are more likely to keep an open mind toward different outcomes of their new venture. Involvement in a new venture's closure also helps entrepreneurs to utilize their lessons learnt and to implement those lessons in their subsequent activities.

Gompers et al. (2010) investigated and compared performance of serial entrepreneurs – those who have been involved in the creation of more than one new venture – in their current ventures based on whether their prior venture has succeeded or has failed. They found that successful entrepreneurs have succeeded in their subsequent venturing activities and unsuccessful entrepreneurs has failed repeatedly. In fact, those successful entrepreneurs have carried positive attitude toward failure, so they have tried to learn at any point in time of entrepreneurial activity. The unsuccessful entrepreneurs who have been engaged in frequent failures have carried a negative attitude toward failure.

Eggers and Song (2015) relied on attribution theory (Jones & Harris, 1967), which indicates how individuals attribute outcomes to external or internal factors to interpret these findings. These scholars suggested that founders are more likely to blame external factors and attribute the outcomes to these external factors after experiencing failure. This belief leads them to switch between industries without changing other aspects of the business. Such a change in the

industry is found to be detrimental to subsequent venture performance. In fact, changing the industry invalidates the industry-specific expertise and detracts from the acquired learning related to the past failure experiences.

Aligned with these findings, Yamakawa et al. (2015) studied the attributions of causes of failure – mechanisms by which individuals explain their own behavior, the others' behaviors, and external events (Martinko, Douglas, & Harvey, 2006; Shaver, Gartner, Crosby, Bakalarova, & Gatewood, 2001) – and found that attributions can influence the effectiveness of the learning process. The findings of the study show that those who attribute the causes of failure internally achieve a greater performance level in their subsequent ventures when the number of failure experiences is low. Moreover, they found that there is no relationship between the number of prior failures and new venture performance.

New Venture Learning

Entrepreneurial learning has emerged as a promising area of research at the interface between learning and the entrepreneurial context (Harrison and Leitch, 2005). Entrepreneurial learning research focuses on what entrepreneurs learn during the exploration and exploitation of an entrepreneurial opportunity in the creation of new ventures and the process of learning itself (Cope, 2005). It is important to find out not only what entrepreneurs should learn but also how and when learning takes place. As Minniti and Bygrave (2001, p.7) assert, "Entrepreneurship is a process of learning, and a theory of entrepreneurship requires a theory of learning."

Learning is a process of experimentation through which individuals, groups, and organizations gain knowledge through analysis, training, and experience. This process helps decision makers to develop, acquire, share and transfer new knowledge (Nonaka and Takeuchi 1995; Zahra, 2012) and to change their behavior and actions accordingly (Zahra, 2012). Learning

also improves innovation and increases engagement in entrepreneurial activities (Hoy, 2008; Huber, 1991; Leonard-Barton, 1995; Nelson & Winter, 1982; Pérez-Nordtvedt et al., 2008).

When we talk about entrepreneurial learning in new ventures, we basically talk about the learning that occurs to the individual entrepreneur. In fact, in the case of new ventures, because the founder is the sole decision maker, his/her learning can be considered to be identical to the learning obtained by the new venture. Therefore, a discontinuation of a new venture learning at an organizational level of analysis is similar to learning at an individual level of analysis. In fact, organizational learning of a new venture is a matter of entrepreneur's learning since the decision maker and founder is an individual so what he/she learns will have a direct influence on the learning of the new venture. In this dissertation, I use the term new venture learning to refer to the learning that occurs at both individual and organizational levels in new ventures. A literature review on organizational learning follows.

Organizational learning is a process by which firms gain information, knowledge, practices, and techniques to improve task performance (Argyris & Schon, 1996; Fiol & Lyles, 1985). This process is important for successful organizational adaptation, survival, and successful performance (Brown & Duguid, 2001; Burgelman & Grove, 2007; Fiol & Lyles, 1985; Rao & Argote, 2006) and promotes entrepreneurial activities by enabling companies to innovate, create new businesses, and renew their operations (Zahra, 2008).

In addition to improving innovativeness, organizational learning develops the ability to identify opportunities that are not recognizable by competitors with poor organizational learning (Hurley & Hult, 1998). Although extensive reviews of the literature on organizational learning and its aspects highlight the importance of engaging in organizational learning processes (e.g., Crossan, Lane, White, & Djurfeldt, 1995; Easterby-Smith, 1997; Fiol & Lyles, 1985; Huber,

1991; Levitt & March, 1988), it is not always easy or even practical to do so. Although organizational learning generates knowledge for building new skills and capabilities that could lead to competitive advantage (Chirico 2008; Zahra et al. 2007a), challenges arise when assimilated new learning (exploration) confronts previously learned knowledge (exploitation) (Crossan et al., 1999).

Organizational learning involves change in thoughts and actions (Crossan et al., 1999; Vera & Crossoan, 2004). It improves the ability of firms to respond to external environmental uncertainties and to adapt to the existing environmental changes quicker than their rivals with poorer organizational learning (Harrison & Leitch, 2005). Scholars argue that firms either try to exploit their existing knowledge in order to develop organizational learning or try to acquire knowledge from external resources which is not currently possessed by the firm (Fiol & Lyles, 1985; March, 1991). In the first case – exploitation – learning occurs inside the firm and the generated knowledge will be distinctive to the firm (March, 1991). Scholars have referred to this type of learning as "Experimental Learning" (EL) (Dess et al., 2003; Zahra et al., 1999), incremental learning (Slater & Narver, 1995), and adaptive learning (Senge, 1990).

Organizational learning can also take the form of "Acquisitive Learning" (AL) (Dess et al., 2003; Zahra et al., 1999), also called as breakthrough learning (Argyris & Schon, 1996) and generative learning (Senge, 1990) through which a firm creates value and explores knowledge by utilizing external resources.

Organizational learning as a multifaceted construct (Huber, 1991) is built on three dimensions: breadth, depth, and speed (Zahra, 2012). These three dimensions help to build a thorough understanding of organizational learning. In fact, each one of these dimensions helps to determine which part of learning needs improvement and what are the possible obstacles. The

breadth of organizational learning depends on the variety of field and areas in which a firm obtains knowledge (Pérez-Nordtvedt et al., 2008; Zahra et al., 2000; Zahra, 2012). Depth of organizational learning refers to the extent of a firm's mastery of the knowledge, whether it is obtained internally or externally. Speed refers to the quickness of the firm in acquiring, processing, and understanding the knowledge gained from internal and external sources (Pérez-Nordtvedt et al. 2008).

Diversity of knowledge obtained through involvement in different fields and the depth of organizational learning creates the foundation for entrepreneurial activities. Speedy organizational learning also helps to improve creativity and continuous innovation, the basis for entrepreneurial activities (Zahra et al. 2007). Deep learning usually increases the firm's ability to create and exploit new knowledge combinations which alter the rules of competition. However, it may slow down both information processing and the organizational response to uncertainty (Zahra, 2012).

In general, the way entrepreneurs approach problems, receive feedback, achieve different outcomes, and make decisions can influence these three dimensions of learning. Entrepreneurship involves the cognitive processes such as counterfactual thinking that can either facilitate learning or inhibit it. In chapter three the influence of constructs which are under study in this manuscript on learning will be discussed in detail.

In the following section, I will review the literature on entrepreneurial exit to find out how entrepreneurs arrive at the conclusion that they should exit the market while they face threads to failure.

Entrepreneurial Exit

Entrepreneurial exit is defined as "the process by which the founders of privately held firms leave the firm they helped to create; thereby removing themselves, in varying degree, from the primary ownership and decision-making structure of the firm" (DeTienne, 2010, p.203). This phenomenon, as an important part of the entrepreneurial process, although noted to have different implications for the firm, the industry, and the economy, has received little attention in the field of entrepreneurship (Wennberg et al., 2010). Scholars have paid too much attention to the creation of new venture and considered the entrepreneurial process as complete by the creation of the venture (DeTienne, 2010). However, business closure can significantly influence the personal life of the entrepreneur, his/her career as a founder, the economic environment in which it operates, and the employees of the firm. Scholars argue that the entrepreneurial process is not complete by its creation and the whole journey and the exit stage, if it happens, should also be included in the completion of the entrepreneurial process (Brockner et al., 2004; Cardon et. al., 2005).

Scholars in the field of entrepreneurial behavior and organizational behavior have shown deep interest in the study of cognitive processes of entrepreneurs as the creators of new ventures. Exit, as part of the process of entrepreneurship occurs due to the decision of the entrepreneur. It is important to unveil the underlying cognitive processes of the entrepreneurs who make exit decisions. In order to find a deep understanding of the entire process of entrepreneurial activity, exit decisions as final stage in the process of entrepreneurial activity and the various forms that they may take should be investigated.

Exit as a widespread phenomenon threatening organizations can take three different forms: market exit (or strategic business exit (Bowman and Singh, 1993)), technological exit, or

firm exit (closure of entire firms) (Decker and Mellewigt, 2007). Each one of these forms can produce different effects on the entrepreneur, the firm, the industry in which the firm operates, and the economy in general.

Reports also indicate that half of entrepreneurs may decide to develop exit strategies while the other half may not (Inc. Magazine Online, 2005). By developing exit strategies, entrepreneurs plan their potential exits and decide when and how to take action. Entrepreneurs who develop exit strategies may take different exit routes such as announcing their exit decision in order to find potential buyers or announcing bankruptcy. The route that entrepreneurs choose to take depends on their previous experience (DeTienne and Cardon, 2007), or their level of learning (Minniti and Bygrave, 2001), and their motivation toward their life after the exit (Minor, 2003).

Exit can be either voluntary, due to reasons such as moves or mergers (Mayer and Goldstein, 1961; McGrath, 2006; Ronstadt, 1986) or involuntary, due to reasons such as poor financial performance (McGrath, 2006) or having children to take care of. Scholars argue that in the study of exit, it is important to differentiate between the performance of firms and the career choices of entrepreneurs as reasons for exit (Arum and Muller, 2004). Wennberg et al. (2010) also argue that it is important to differentiate the exit of the entrepreneur from the exit of the firm itself. In my study, exit of the firm itself is under investigation as a voluntary decision by the entrepreneur who experiences setbacks or starts to have upward counterfactual thoughts.

Studying the strategy of exit or its reasons is beyond the domain of this research. Instead, investigating the likelihood of exiting the market as a reaction to receiving setbacks and carrying counterfactual thoughts is being investigated. In fact, the likelihood that the entrepreneur ends the business and chooses paid employment or starts a new venture will be considered. Audretsch

(1994) determined that start-up size, ownership status, and the industry environment all affect the likelihood of a start -up subsequently exiting the market.

Summary of the Chapter

In this chapter, I reviewed the literature on entrepreneurial decision-making, counterfactual thinking, entrepreneurial biases, failure, new venture learning, and entrepreneurial exit. This review helps readers to understand the underlying relationship between the variables of the study.

In the following chapter, I will provide the theoretical grounding to explain how different types of reasoning of entrepreneurs – effectuation and causation – influence new venture learning and the entrepreneurial exit decision. During the journey of entrepreneurship, entrepreneurs' cognitive abilities, their behavioral biases, and specific emotions like fear; along with other phenomena such as experience of critical setbacks, influence their entrepreneurial decisions and learning. I will provide in-depth explanation regarding these relationships and will take the step to answer the research questions of the study.

The literature review provided in Chapter 2 and the theoretical foundation provided in Chapter 3 will help to close the identified gap in the literature on entrepreneurial decision-making, learning, and exit decisions of the entrepreneur. In fact, this research proposal will determine how different entrepreneurial biases such as illusion of control; cognitive processes such as counterfactual thinking; and various forms of failure, whether it is fear, attitude, or perception will contribute to the relationship that exist between the continuum of effectuation/causation and two dependent variables of the study, learning and exit.

CHAPTER III

THEORETICAL DEVELOPMENT

"The entrepreneurial journey starts with jumping off a cliff and assembling an airplane on the way down."

— Reid Hoffman, founder of LinkedIn

In this chapter, I will propose how effectuation influences entrepreneur's decision to exit and new venture's learning. I will also propose that the relationship between the independent variable and dependent variables of the study is influenced by a number of moderators and mediators. To be more specific, in this chapter I will propose that the relationships between effectuation and two dependent variables of the study are mediated by counterfactual thinking and illusion of control. In addition, these relationships are moderated by fear of failure, learning attitude toward failure, escalation of commitment, and critical setback experiences. To support the arguments, I will refer to underlying theories such as adaptive learning theory, prospect theory, theory on avoidance and approach motivation, and self-justification perspective as well as previously conducted empirical and conceptual research in the fields of cognition, psychology, entrepreneurship, and organizational research.

My research model includes 18 testable hypotheses that are categorized into five groups. I identified these groups based on the similarity of the concepts, interpretations, and theoretical foundations of the constructs. In each subsection of this chapter, I will include the research

model of the study with a focus on the proposed hypotheses in the related subsection. This will help the readers to better understand the hypotheses under my investigation. The chapter ends with a summary table of the developed hypotheses.

In the next chapters of my dissertation, I have explored whether the final results would support the theories discussed in this chapter.

Theoretical Framework

This study aims to investigate how effectuation leads to learning and impacts likelihood of exit while entrepreneurial biases appear and cognitive challenges such as counterfactual thinking come into existence. For this reason, I take a step-by-step approach toward explaining the relationships. For each relationship, I will provide the theoretical grounding of the relationship in terms of the rationality behind the subject, the underlying theories, and the supporting literature in the fields of entrepreneurship and/or psychology. I will then draw conclusions in terms of the research hypotheses.

The influence of effectuation on new venture learning and the role of two moderators of learning attitude toward failure and critical setback experiences on this relationship

The influence of effectuation on new venture learning can be explained through the lens of emergent strategic approaches and the four dimensions of effectuation – experimentation, affordable loss, flexibility, and pre-commitments. According to the theory of effectuation, entrepreneurs select the effect that they would like to create based on the set of available means (Reymen et al., 2015; Sarasvathy, 2001a; Venkataraman and Sarasvathy, 2001). This theory indicates that creating an "effect" (in other words, an outcome) in effectuation process does not require particular "means" such as particular resources which are not available at hand, but the entrepreneur tries to provide in order to create the intended outcome. In effectuation process, the

entrepreneur utilizes the available resources, instead of demanding unavailable resources, and explores what possible outcomes can be created using these available resources. After this step, the entrepreneur chooses between those possible outcomes and decides to create one or more of them.

In order to further explain how effectuation processes work, first, I discuss two different directions that organizational strategy can generally take. Organizations take different strategic approaches along the continuum of "emergent strategies" and "deliberate strategies" (Mintzberg and Waterz, 1985). Emergent strategic approaches – identified in contrast to deliberate strategic approaches – evolve in the absence of the decision maker's intention while there is consistency in action. The main difference between these two approaches is that deliberate or intended strategies are formed exactly as the decision makers plan and when no external forces (e.g., market, technological, political) exist.

To have a deliberate strategy, an organization should be able to perfectly predict the environment or have a full control of the environment. Unlike deliberate strategic approaches that help the decision maker to have a surprise-free path ahead, the emergent strategic approaches do not prepare the decision makers to deal with uncertainty in the future and do not provide the necessities to predict the upcoming events. According to emergent strategic approaches (including effectuation), the decision maker does not define a set of actions, but the environment directly imposes a *pattern of action* on the organization. Therefore, the strategy emerges and develops over time instead of being defined by the decision maker's intention (Mintzberg and Waters, 1985).

Effectuation provides an emergent strategic approach and considers the entrepreneurial journey as a dynamic process which evolves over time (Chandler et al., 2007; Chandler et al.,

2011, Mintzberg and Waters, 1985). Therefore, it emphasizes the role of one individual who holds personal control of the organization. This individual imposes his or her vision to provide a general sense of direction for the organization and keeps consistency in the action. Although this strategic approach does not form on intentions, intentions might still exist. However, the intentions which are created through an emergent strategic approach are both more difficult to identify and less specific than intentions of deliberate strategies. Effectuation provides new ventures with an emergent strategic decision logic to quickly adapt to unpredictable environmental changes and to innovatively construct new environments, if necessary (Sarasvathy 2001a; Wiltbank et al. 2006). Therefore, entrepreneurs who involve effectuation processes have the ability to react quickly to feedback on past actions and to identify new opportunities or threats in the environment (Mintzberg and Waters, 1985). Eventually, they can survive with limited resources.

According to organizational learning theory, organizations develop better understanding and interpretation of environment via increased knowledge (Fiol and Lyles, 1985). This process is called learning. Emergent strategic approaches seem to pave the way for learning and acquiring such knowledge. Consistent with emergent strategies, effectuation allows new ventures to engage in exploratory learning for strategy formulation when facing high uncertainty (Mintzberg, 1978; Mintzberg and Waters, 1985; Sarasvathy, 2001a). When the strategic approach of the organization is deliberate, messages from the environment tend to get blocked out. In contrast, emergent strategic approaches, including effectuation approach, open the process of learning (Mintzberg and Waters, 1985). Effectuation facilitates exploratory learning through accepting feedback, receiving environmental responses, and making adjustments in entrepreneurial behavior and strategy.

Learning developed in effectuation process can be further interpreted via four dimensions of effectuation: experimentation, affordable loss, flexibility, and pre-commitments/strategic alliance (Chandler et al., 2011; Fisher, 2012). These dimensions indicate that effectuation is formed on short-term experiments, evaluation of the maximum affordable loss, flexibility required to deal with environmental contingencies, and control of the future through partnership with others. Each one of these dimensions has different contributions to new venture learning.

The first dimension of effectuation, experimentation, refers to trial and error approaches which effectual entrepreneurs use to find the most appropriate way to reach their goals (Chandler et al., 2011; Nicholls-Nixon, Cooper, and Woo, 2000). Experimentation helps new ventures to easily and quickly sense the frequent changes of the environment and to adapt to them (Andries, Debackere, and Looy, 2013). By experimentation, new ventures will gain new knowledge that helps them in developing new goals while learning about cause-effect relationships between actions and outcomes. Through this process, entrepreneurs learn what works in causal relationships and what does not work and consequently decide whether to implement a particular behavior in future circumstances. Experimentation also helps entrepreneurs to enhance their learning and to quickly grab valuable opportunities (Cai et al., 2017).

The second dimension of effectuation – affordable loss – indicates that effectual entrepreneurs estimate what they can put at risk and afford to lose if they intend to pursue and exploit an opportunity (Chandler et al. 2011; Dew et al. 2009). Therefore, effectual entrepreneurs control the possible risk of exploiting an opportunity by clarifying the amount of loss they can afford and the level of resources that they can allocate to the exploitation process (Dew et al. 2009; Sarasvathy, 2001a). Affordable loss contributes to learning by training the entrepreneur to assess risk and available resources. If the entrepreneur finds an opportunity that

needs more resources and a higher affordable risk, he/she may decide to find another opportunity to pursue. As a result, affordable loss facilitates entrepreneurial learning by improving the entrepreneur's ability to identify the opportunities that he/she can further exploit.

The third dimension of effectuation is flexibility which facilitates a new venture's response to environmental changes. Therefore, under uncertain conditions, new ventures can quickly adapt to ongoing changes and take advantage of this fast adaptation (Chandler et al. 2011; Sarasvathy, 2001a). Through flexibility, entrepreneurs identify new opportunities that match the resources they possess. Flexibility contributes to learning by helping the entrepreneurs to creatively combine the resources at hand, create novel effects, and stay proactive to adapt to changes. Through flexibility, entrepreneurs also gain new knowledge and build capabilities to utilize the obtained knowledge.

The last dimension of effectuation – pre-commitments and strategic alliances – helps entrepreneurs to create a variety of external knowledge sources (Chandler et al., 2011; Fisher, 2012). Through strategic alliances, new ventures obtain unique resources before they get fully involved in the process of opportunity exploitation and use the experience of their partners without spending resources. Moreover, obtaining competitive resources from external stakeholders will pave the road for new ventures to enhance their learning.

Based on aforementioned arguments on the influence of effectuation dimensions on new venture learning and the nature of effectuation as an emergent strategic approach, I propose a positive relationship that exists between effectuation and new venture learning.

Hypothesis 1: Effectuation positively influences new venture learning.

In early stages of developing a new venture, entrepreneurs deal with high levels of uncertainty and various liabilities of newness, and they must overcome a variety of obstacles to

survive. These obstacles, also termed as critical setback experiences, can strengthen the learning resulting from effectuation. As a matter of fact, the critical setbacks, which are defined as unanticipated problems that challenge and undermine the existing values and goals of a new venture (Politis and Gabrielsson, 2009), will create a positive challenge for entrepreneurs who follow an effectual logic. To further develop the idea that critical setback experiences have positive influences on the learning resulting from effectuation, I begin my discussion on how failure experiences influence learning. Since critical setbacks can trigger a perception of a potential failure and can simulate the failure mechanism in an entrepreneur's mind, these experiences could be treated as a prototype model of actual failure experiences. As a result, simulation of failure in the mind of the individual improves the learning process, especially if effectuation is the entrepreneur's decision-making style.

Many scholars in the field of entrepreneurship agree that failure experiences will result in improved learning because the skills and knowledge required to run a firm have an experiential nature (Starr & Bygrave, 1991). They believe that individuals learn more from their failures than their successes (McGrath, 1999; Sitkin, 1992). According to the literature, failure is an important source for development of knowledge and skills that can be highly useful in subsequent entrepreneurial activities. As a matter of fact, after a business failure, founders have an opportunity to learn from this heuristic experience (Baron, 2004; McGrath, 1999; Minniti & Bygrave, 2001; Shepherd, 2003; Sitkin, 1992). Yamakawa et al. (2015) referred to learning as a mechanism by which individuals react to failure. Empirical research in this area also shows that entrepreneurs are mostly more successful in their second venturing activities (as opposed to the first one) (Kawakami, 2007). Such failure experiences help individuals to increase the odds of

success for their subsequent ventures (Minniti and Bygrave, 2001) by preventing the same incidents from reoccurring and by learning the important reasons for their failures.

Like actual failure experiences, learning will be improved for the entrepreneurs who experience several critical setbacks in their ventures whether considered as successful or unsuccessful. Critical setback experiences activate the feeling of a potential failure (Politis and Gabrielsson, 2009) and these experiences increase the entrepreneur's knowledge and expertise (Shepherd, 2003). Cyert and March (1963) assert that obstacles and critical setbacks can trigger the pursuit of alternative solutions to a problem which in return motivates the individuals to deal with critical setbacks and to save their ventures accordingly.

Wiltbank et al., (2006) refer to these obstacles as new venture surprises and argue that entrepreneurs with an effectual mindset take advantage of these obstacles and receive them as feedbacks required to adjust the strategies and entrepreneurial actions. In fact, effectual entrepreneurs consider the occurrence of such surprises as a shortcut for creating/discovering new opportunities and means of identifying new values and goals for their new ventures (Wiltbank et al., 2006). As discussed earlier in the chapter, effectuation as an emergent strategic approach improves entrepreneurial learning. Experiencing critical setbacks can enhance the learning resulting from the effectuation process by providing a feedback loop for the entrepreneur. Further, occurrence of critical setbacks temporarily simulates the actual failure experiences and forces the entrepreneur to rethink selected strategies, decisions, and previously taken actions. Thereby, an entrepreneur learns from his own mistakes. This process will be facilitated if the entrepreneur experiences critical setbacks.

To summarize, critical setback experiences challenge the four dimensions of effectuation and create a positive impact on new venture learning.

Hypothesis 2: Critical setback experiences moderate the effect of effectuation on new venture learning such that the higher the critical setback experience, the stronger the positive relationship between effectuation and new venture learning.

In addition to critical setback experiences, the attitude toward failure can moderate the relationship between effectuation and new venture learning. Regarding the actual failure experiences, Politis and Gabrielsson (2009) argue that failure is just a temporary phase in an ongoing entrepreneurial process and can be used as a valuable source of learning and improved self-awareness. These authors believe that the attitude of the individual toward failure is very influential on learning. By holding a positive attitude toward the act of failing, the entrepreneur exposes him/herself to an explicit experience of learning (Shepherd, 2003). Holding a positive attitude toward failure helps the entrepreneur to be more receptive and to consider potential future failure situations as a temporary problem. A positive attitude also helps him/her to continue experimenting and remain flexible. These two dimensions of effectuation (experimentation and flexibility) enhance entrepreneurial learning.

In other words, positive attitude also helps him/her to avoid freezing under threatening circumstances. Therefore, the entrepreneur shows more tendency to experiment with the available opportunities and resources through trial and error. Moreover, by staying flexible, the entrepreneur will empower him/herself to rebound from failure, if occurs. In the process of rebounding from failure, effectual entrepreneurs actively seek to gain more knowledge, which in turn improves their learning.

Considering the above arguments, I hypothesize that:

Hypothesis 3: Learning attitude toward failure moderates the effect of effectuation on new venture learning such that the higher the learning attitude toward failure, the stronger the positive relationship between effectuation and new venture learning.

Based on the provided discussion I conclude that effectuation enhances learning and the combination of critical setback experiences and holding a positive attitude toward failure will enhance the positive relationship between effectuation and learning. *Figure 1* highlights the first group of the hypotheses of this proposal.

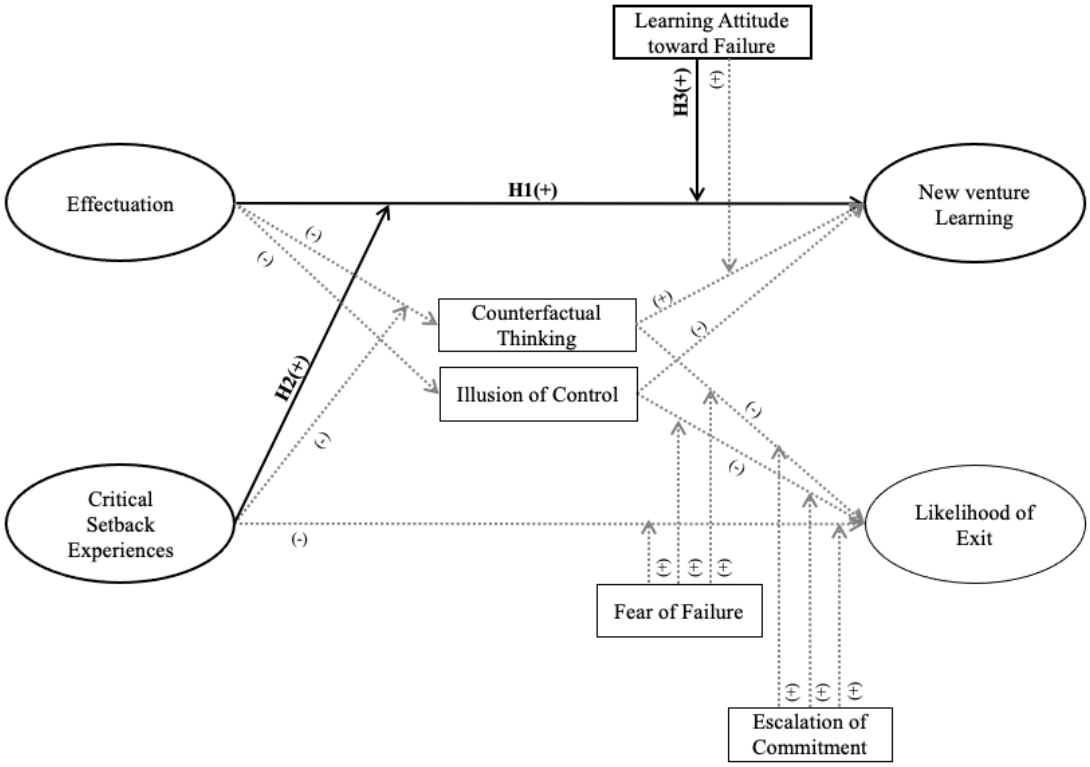

Figure 1:The Interrelationship among Effectuation, Critical Setback Experiences, Learning Attitude Toward Failure, and New Venture Learning

Counterfactual Thinking as a Mediator of the Relationship between Effectuation and New Venture Learning

In this section, I will investigate the influence of counterfactual thinking as a mediator of the relationship between effectuation and new venture learning. Counterfactual thinking refers to the process of altering factual antecedents from the past and evaluating the possible consequences, had other choices been made (Roese, 1997). As discussed in the literature review chapter, counterfactual thinking can be classified as upward or downward. If the alternatives are assessed to be better than actuality, we are dealing with upward counterfactual thoughts If the alternatives are assessed to be worse than the actual situation, they are called downward counterfactual thoughts.

Due to the nature of this study and the existence of elements such as critical setbacks which trigger the feeling of failure, I will study the influence of upward counterfactual thoughts in my research model. Literature on counterfactual thinking has mostly used the term counterfactual thinking to refer to upward counterfactual thoughts. In order to be consistent with previous studies in the field of counterfactual thinking, I drop the term "upward" and use "counterfactual thinking" to refer to the concept of "upward counterfactual thinking".

Studies in the field of entrepreneurial cognition suggest that, in general, entrepreneurs are less likely to engage in counterfactual thinking than non-entrepreneurs for several reasons (Baron, 1998; Miller and McFarland, 1986; Gilovich and Medvec, 1994): First, entrepreneurs often adopt a strong future-oriented perspective that may reduce their tendency to reflect on past events (Kahneman and Lovallo, 1994). Second, they carry cognitive biases, such as overconfidence, that help them to anticipate positive future outcomes and not pay too much attention to past events (Busenitz and Barney 1997; Russo and Schoemaker, 1992). Third, they

mostly accept and admit past mistakes, thus they are less concerned about "what might have been" (Baron, 1998). Last, entrepreneurs keep a positive and optimistic perspective about events, so they are less likely to engage in counterfactual thoughts that are triggered by negative affect (Hatten, 1997).

Effectuation can lower the levels of counterfactual thinking among entrepreneurs. In fact, the entrepreneurs who follow effectual logic in decision-making get less involved in counterfactual thoughts than those who do not follow effectual logic. Scholars conceptualize counterfactual thinking in terms of the degree of regret, since it is closely linked to experience of regret (Baron, 1998, 2000; Markman et al., 2002, 2005; and Arora et al., 2013). Research shows that the biggest regret of entrepreneurs is related to their missed opportunities during life occurrences during which they had the freedom of choice, but they did not take the risk to pursue the opportunity (Roese and Summerville, 2005). Sarasvathy, Simon, and Lave (1998) assert that effectual entrepreneurs can see opportunities in situations in which others tend to see risks; therefore, effectual entrepreneurs take action and pursue opportunities while others do not. Integrating these findings, I argue that if effectuation results in pursuing more opportunities, then entrepreneurs would not regret that they have pursued those opportunities. In other words, if entrepreneurs do not miss the biggest opportunities, they will not experience the biggest regrets. In this case, even if the entrepreneur fails while pursuing opportunities and the outcomes turn out unfavorably, he/she will not hold regretful thoughts due to having at least initiated action.

The negative relationship between effectuation and counterfactual thinking can be interpreted through three dimensions of effectuation: experimentation, flexibility, and affordable loss. Experimentation as a trial-and-error process gives the entrepreneur the opportunity to experiment without regretting their decisions. Effectual entrepreneurs believe that trial and error

are inevitable parts of the entrepreneurial processes. There is therefore no room for regret. They believe that they can achieve more favorable outcomes in the long run by trial and error, followed by knowledge enhancement.

By holding the flexibility dimension of effectuation, entrepreneurs keep an open mind toward receiving any possible outcome whether it is pleasant or unpleasant. In other words, flexible entrepreneurs look for new opportunities and attempt to make necessary changes in their behaviors and strategies in order to succeed instead of looking through missed opportunities and unfavorable outcomes.

Affordable loss as another dimension of effectuation helps entrepreneurs to evaluate the maximum loss that they can afford by evaluating the worst-case scenarios. Early in their entrepreneurial journey, effectual entrepreneurs know what they may lose in case of failure. Non-effectual entrepreneurs try to estimate their expected returns instead of identifying the affordable loss. Rather than looking through worst-case scenarios, non-effectual entrepreneurs focus on the highest returns (expected returns versus affordable loss). Accordingly, when non-effectual or less-effectual entrepreneurs fail, they become involved in counterfactual thought to identify mistakes and what should have been differently.

Sternberg (2004) claims that entrepreneurs who get less involved in counterfactual thoughts may not foresee unexpected consequences of their actions compared to those who have higher levels of counterfactual thinking. In this study, I challenge this idea and argue that this assertion can be true about non-effectual entrepreneurs who define the objectives of their new venture and set their expected returns. Non-effectual or less-effectual entrepreneurs focus intently on the defined objective of their new venture, and they may not foresee or expect other consequences such as failure. In this case, if they do not achieve their objectives, they experience

counterfactual thoughts. In contrast, effectual entrepreneurs keep seeking new opportunities as part of the experimentation process. They try to foresee possible consequences of their actions without getting involved with deeply regretful thinking.

Instead of experiencing negative affect, feeling regret and thinking counterfactually when unfavorable outcomes are achieved, effectual entrepreneurs naturally remain passionate to turn negative consequences into new opportunities and to set new goals (Wiltbank et al., 2006). In fact, their effectual mindset helps them to easily deal with unfavorable outcomes compared to less-effectual entrepreneurs. Effectual entrepreneurs reassess the entrepreneurial processes and behaviors in which they are involved and may try to make radical changes, if needed. Following this reassessment, entrepreneurs gain insights about other possible opportunities and evaluate them to see if they are worth exploring (Gaglio and Katz, 2001).

When effectual entrepreneurs experience critical setbacks and obstacles, they are likely to get more involved in counterfactual thinking processes. These negative experiences trigger the perception that the venture is failing. Therefore, the entrepreneur's mind begins to look for solutions and evaluate what has been done improperly. Critical setbacks confront the entrepreneur's goals and objectives and lead the entrepreneur to more counterfactual thoughts. In these situations, counterfactual thinking is a tool for the entrepreneur to figure out the underlying reasons of experiencing critical setbacks.

The effectuation process results in more counterfactual thinking when entrepreneurs experience setbacks. Effectual entrepreneurs involve themselves in the process of experimentation to acquire knowledge regarding the experienced setbacks and assess how the result could be different, had they undertaken different actions (counterfactual thoughts). Therefore, I propose that a negative relationship exists between effectuation and counterfactual

thinking and this relationship is negatively influenced by critical setback experiences as a moderator.

Hypothesis 4: Effectuation negatively influences counterfactual thinking.

Hypothesis 5: Critical setback experience negatively moderates the relationship between effectuation and counterfactual thinking in such a way that the higher the critical setback experience, the weaker the negative relationship between effectuation and counterfactual thinking.

Although effectual entrepreneurs get less involved in the process of counterfactual thinking than less-effectual entrepreneurs, counterfactual thoughts can positively impact learning. The influence of counterfactual thoughts on learning can be explained through theories of adaptive learning (Megiddo 1980; Foster & Vohra 1999; Hart & Mas-Colell, 2000; Foster & Young 2003). These theories consider regret as a form of adaptive learning and argue that when individuals make decisions sequentially, their upcoming decisions will be made by evaluating the outcome of a prior decision (Coricelli and Rustichini, 2010). In fact, people learn using the outcome of action (feedback) to revise their belief systems (Huy, 1999; Weick, 1979). Individuals who experience regret as part of the counterfactual thinking process try to explore what optimal solutions they have dismissed while they were making their previous decision(s). According to adaptive learning theory, regret and reevaluation of past choices which have resulted in unfavorable outcomes can improve learning and can lead decision makers toward adjusting their current or future goals and behaviors.

In addition to adaptive learning perspective to enhance learning, Baron (2000,) refers to the cognitive and emotional differences of entrepreneurs and non-entrepreneurs. He argues that non-entrepreneurs' involvement in counterfactual thoughts is followed by negative emotions

which work as a barrier to learning. Shepherd (2003) uses the theory on grief and emotions to discuss how generation of negative emotional response prevents learning. He asserts that learning occurs solely when the individual finds the power to utilize the knowledge gained through a negative event. According to this perspective, immediately after a negative event occurs, individuals do not have the power to evaluate what has gone wrong. As time passes and the individual recovers from the grief, he/she looks back to the failure experience and starts to re-evaluate his/her prior actions/decisions and begins to learn.

Dealing with counterfactual thoughts, entrepreneurs learn how to improve their task strategies. When negative thoughts appear, entrepreneurs start to learn, however, this time they do not involve in a grief process since the failure has not actualized. Accordingly, they reassess and reconsider the past from the perspective of constructing more effective strategies. This process will help to generate positive outcomes on future occasions (Baron, 2004). Instead of being overwhelmed with negative affect, entrepreneurs acquire knowledge through the counterfactual thinking process and develop enhanced strategies in their subsequent endeavors (Yamakawa et al., 2010a). Counterfactual and regretful thoughts play a functional role in developing the individuals' learning by strengthening the ability to evaluate available options (Coricelli and Rustichini, 2010). As a result, I propose that counterfactual thinking positively influences new venture learning.

Hypothesis 6: Counterfactual thinking positively influences new venture learning.

The entrepreneur's learning attitude toward failure can positively affect the relationship between counterfactual thinking and new venture learning. Scholars argue that if entrepreneurs hold a positive attitude toward failure, the act of failing can be not only confronted, but studied and dealt with in a systematic and professional manner (Cannon and Edmondson, 2005). As

discussed in Chapter 2, positive attitude towards failure helps individuals to protect themselves from repeating the same mistakes (Cannon and Edmondson, 2005) and to find new opportunities while improving their learning techniques (Sarasvathy, 2001a). Holding a negative attitude toward failure, on the other hand, diminishes the ability of the individuals to make sense of unfavorable experiences and weaken the ability to deal with a similar problem (McGrath, 1999; Shepherd, 2003).

Entrepreneurs who carry counterfactual thoughts may experience regret that in return can activate the perception of failure. Entrepreneurs who hold positive attitudes toward failure are more likely to accept feedback from the external environment and reassesses past behaviors. Therefore, holding a positive attitude toward failure can enhance learning. Figure 2 depicts the second group of hypotheses in my proposal.

To sum up, by keeping an open mind toward any shortcomings of their prior decisions, entrepreneurs acquire new knowledge through the process of counterfactual thinking and utilizes counterfactual thoughts to reassess and reevaluate past actions and behaviors. These processes help them to improve their subsequent courses of actions and to address rising problems instead of losing control. Considering these arguments, I hypothesize that:

> **Hypothesis 7**: Learning attitude toward failure moderates the relationship between counterfactual thinking and new venture learning such that the higher the learning attitude toward failure, the stronger the positive relationship between counterfactual thinking and new venture learning.

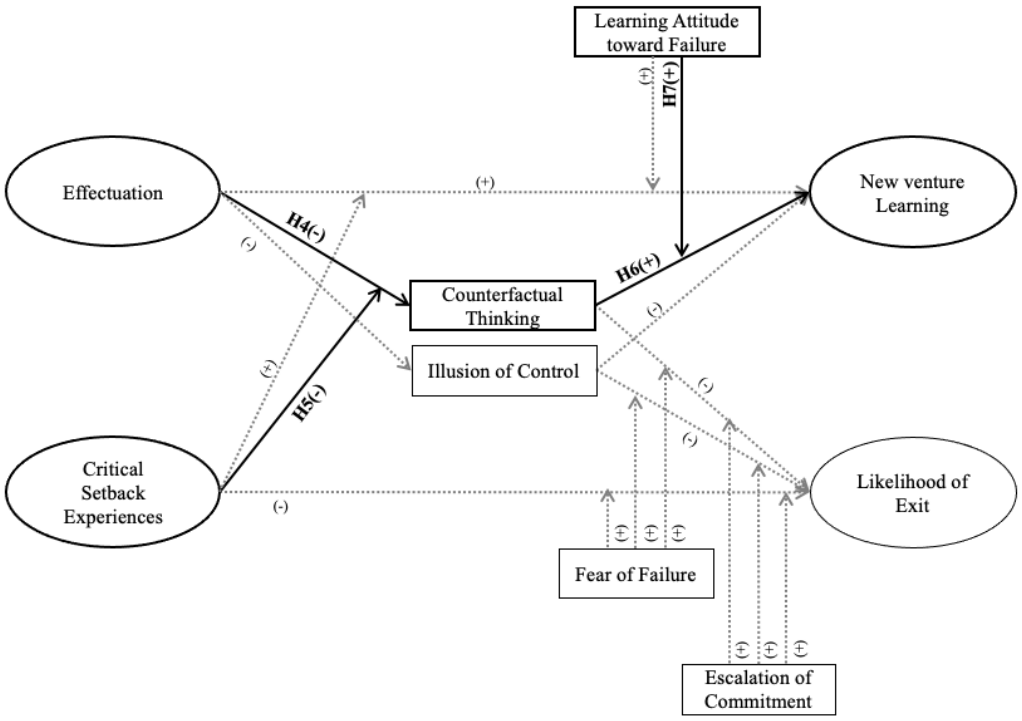

Figure 2: The Interrelationship among Effectuation, Critical Setback Experiences, counterfactual thinking, Learning Attitude Toward Failure, and New Venture Learning

Illusion of Control as a Mediator of the Relationship between Effectuation and New Venture Learning; and the Relationship between Effectuation and the Likelihood of Exit

In this section, I will investigate how illusion of control play a role on the relationship between independent and dependent variables of the study. *Figure 3* depicts the relationship under study in this section.

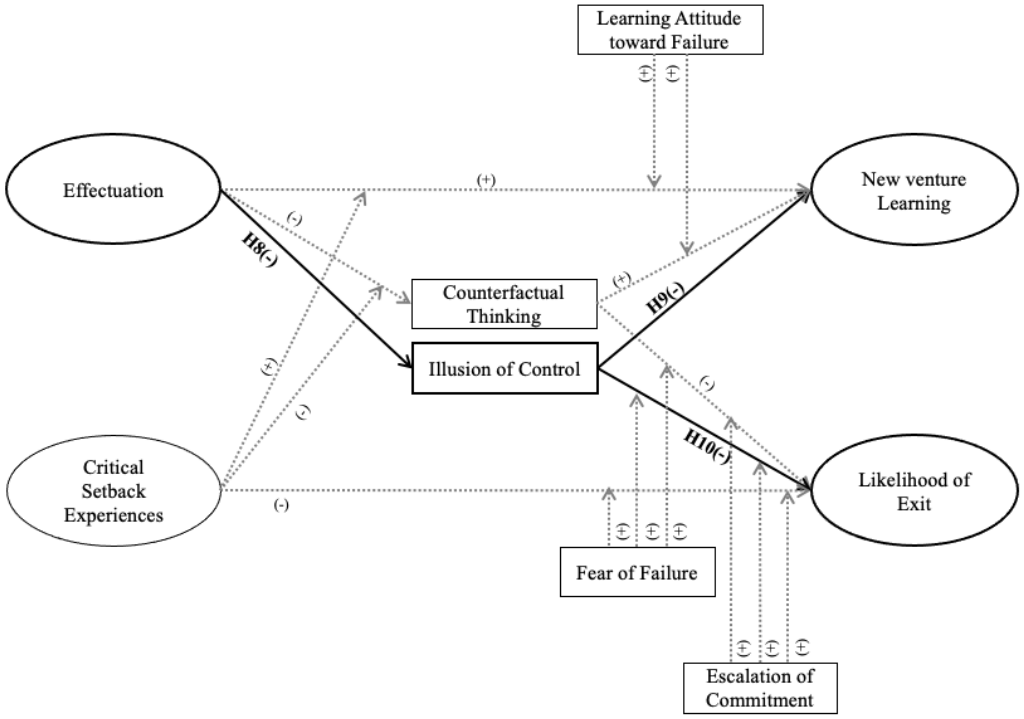

Figure 3: The Interrelationship among Effectuation, Illusion of Control, New Venture Learning, and Likelihood of Exit

Studies in the field of entrepreneurial decision-making differentiate between effectuation logic and causation logic and rely on concepts of control and prediction to explain why entrepreneurs behave the way they do. Causation processes focus on the predictable aspects of an uncertain future and assert that "To the extent that we can predict the future, we can control it". According to this perspective it is important to *predict* the future in order to *control* unfavorable outcomes of the future. Entrepreneurs with a causation approach to decision-making believe that they can control the future if they predict the upcoming occurrences by obtaining information (Sarasvathy, 2001a, 2004; Sarasvathy, Menon, & Kuechle, 2013; Wiltbank et al., 2006). In contrast, effectual logic of decision-making claims that "To the extent that we can control the future, we do not need to predict it." (Sarasvathy, 2001a, p.252). Logic of effectuation considers human action to be the predominant factor in shaping the future. According to this logic, there is

no need to predict the future because human actions and behaviors at the moment can control the future outcomes.

At the first glance, effectuation logic may seem to be more compatible with the interpretation of the illusion of control since they both talk about the phenomenon of controlling events. Logic of effectuation indicates that by controlling behavior and actions, individuals can take control over the future. Similarly, illusion of control emphasizes the concept of control. Here, I claim that the concept of control proposed by illusion of control differs from the concept of control proposed by effectuation logic. Illusion of control occurs when individuals overemphasize the extent to which their skill can increase performance and improve outcomes in situations where chance plays a significant role and skill is not necessarily a deciding factor (Cowley et al., 2015; Langer, 1975). Entrepreneurs with high degree of illusion of control bias believe that their skills or abilities can influence the outcome of their new venture even if external factors contribute to the results. With high illusion of control, entrepreneurs see themselves as causal agents in gaining outcomes and as a result they rely too much on their skills.

Presson and Bennasi (1996) conducted a meta-analysis of illusion of control using fifty-three experiments extracted from twenty-nine studies and argued that researchers who have studied illusion of control have not actually identified the concept of control. Presson and Benassi (1996) further explained that Langer (1975) who first established the scale of illusion of control bias, has measured the participants' judgment of their prediction ability and labeled it as illusion of control. The Presson and Bennasi (1996)'s meta-analysis suggests that the phrase "illusory judgment" would better describe the bias of illusion of control and would fix the issue of conceptualization.

Although I agree with Presson and Bennasi (1996) that illusory judgment is a more appropriate phrase to refer to the entrepreneurial bias of illusion of control, to keep consistency in the literature, I use the phrase "illusion of control" which has been widely employed by other scholars in literature. Here, I argue that the concept of effectuation describes controlling the present rather than controlling the future.

As an example, effectuation logic requires entrepreneurs to define their own markets as a community of people willing and able to commit enough resources to sustain the new venture. Causation approaches require the entrepreneur to predict future markets, therefore causal entrepreneurs focus on improving their ability to collect information and analyze it to face fewer uncertainties in the future. Through a causation approach, individuals collect more information about the future and build the perception that they can control events in the future. In fact, obtaining information and knowledge results in strong beliefs on the part of entrepreneurs in their own prediction abilities. In contrast, entrepreneurs with effectuation logic are less concerned about obtaining information and predicting the future. As a result, they are less likely to hold illusion of control bias compared to non-effectual entrepreneurs. Therefore, I claim that there is a negative relationship between effectuation and illusion of control.

Hypothesis 8: Effectuation is negatively related to illusion of control.

Illusion of control can partially explain the relationship between effectuation and the dependent variables of my study – new venture learning and the likelihood of exit. In order to clarify and examine this mediating relationship, I will first investigate how illusion of control influences new venture learning. A review of the literature shows that there is inconsistency among scholars regarding the relationship between illusion of control and learning. Some argued that illusion of control enhances learning (Mahoney, 1974; Monty and Perlmuter, 1975;

Perlmuter and Monty, 1977). Others claim that illusion of control decreases learning (MacKillop et al., 2006; Mezirow, 1991; Steenbergh et al., 2002).

Scholars supporting the positive impact of illusion of control on new venture learning, argue that sense of control in individuals creates the perception of freedom of choice which in return enhances learning (e.g., Mahoney, 1974; Monty and Perlmuter, 1975; Perlmuter and Monty, 1977). Their reasoning lies in the idea that lack of freedom of choice can block the cognitive abilities of the individual and restrict learning. Individuals with no sense of control will not perceive freedom of choice and resist learning. According to this perspective, if an individual does not have a sense of control, his/her cognitive ability will not receive and restore new knowledge; accordingly, learning will not occur. Therefore, the higher the illusion of control, the more intense the learning process would be.

In contrast to this view, another group of scholars asserts that illusion of control creates a blind spot in the minds of the individuals and prevents them from learning. Individuals with a high illusion of control particularly rely on their own knowledge base and may not be able to process new information. Cognitive schema theory explains that a cognitive structure consisting of a person's core beliefs and assumptions developed over time (Beck and Weishaar, 2005) may restrict individual learning ability in such a way that he/she disregards new information. These cognitive structures influence the way in which individuals process their current experiences and establish new sets of information.

Cognitive schemas provide individuals with knowledge about self and their surrounding environments and influence the way individuals assess a new event (Beck and Weishaar, 2005). Scholars argue that schemas create a pre-existing assumption about the way the world is

organized (Singer, 1968). Therefore, when the individual receives new knowledge, he/she refers to these pre-existing cognitive schemas to process it.

Individuals with illusion of control bias tend to restrict their processing of information to their available cognitive schemas. They may unintentionally receive only the information that is compatible with their current schemas. During this "sense-making" process, individuals may insist on pursuing the previously chosen strategies and may implement past behaviors in new circumstances (MacKillop et al., 2006; Steenbergh et al., 2002). When individuals are unable to change their problematic frames of reference (mindsets, habits of mind, meaning perspectives), their learning ability diminishes (Mezirow, 1991).

Considering these two perspectives toward the impact of illusion of control on new venture learning, I argue that illusion of control as a bias refers to the belief of individuals regarding their ability to predict the future even if the outcomes are chance-based or a matter of luck. Illusion of control provides individuals with an unrealistic assessment of their abilities. This unrealistic approach makes individuals biased in relation to their capabilities and diminishes learning. Referring to the concept of freedom of choice and its positive impact on learning, here I claim that illusion of control subverts learning rather than creating a positive attitude toward learning by creating freedom of choice. Illusion of control promotes control when it might not be valid or reliable. Overemphasis on control restricts learning by forcing the individual to conform to available cognitive schemas and carrying a false perception of control. Therefore, I claim a negative relationship between illusion of control and learning.

Hypothesis 9: Illusion of control is negatively related to new venture learning.

Under the conditions of uncertainty and risk, and within a random chance-based setting, illusion of control helps entrepreneurs to keep an optimistic perspective and enables them to cope

with stressful situations (Taylor and Brown, 1988; Wohl and Enzle, 2002, 2003, 2009). An underlying reason for this process is that entrepreneurs have the desire to improve their own feelings of self-worth (Thompson et al., 1998). A high degree of illusion of control causes the entrepreneurs to believe that even luck is a personal quality. Therefore, they can control all possible events (Wohl and Enzle, 2002; 2003; 2009).

The need to avoid an outcome is another reason why illusion of control comes into existence (Biner et al., 2009) and it influences the entrepreneur's decisions. This phenomenon forces entrepreneurs toward insisting on prior behaviors. Illusion of control releases the stress and negative thoughts of entrepreneurs and saves them from experiencing negative emotions and unpleasant feelings (Alloy & Clements, 1992). The likelihood of exiting the market therefore diminishes. Based on these arguments, I propose the following hypothesis:

Hypothesis 10: Illusion of control is negatively related to likelihood of exit.

Influence of Counterfactual Thinking and Critical Setback Experiences on the Likelihood of Exit

In following, I will determine how likelihood of exit, as a dependent variable of the study, varies with changes in the levels of critical setback experiences, counterfactual thinking, illusion of control, and fear of failure. Figure 4 illustrates the next group of the hypotheses in this research proposal.

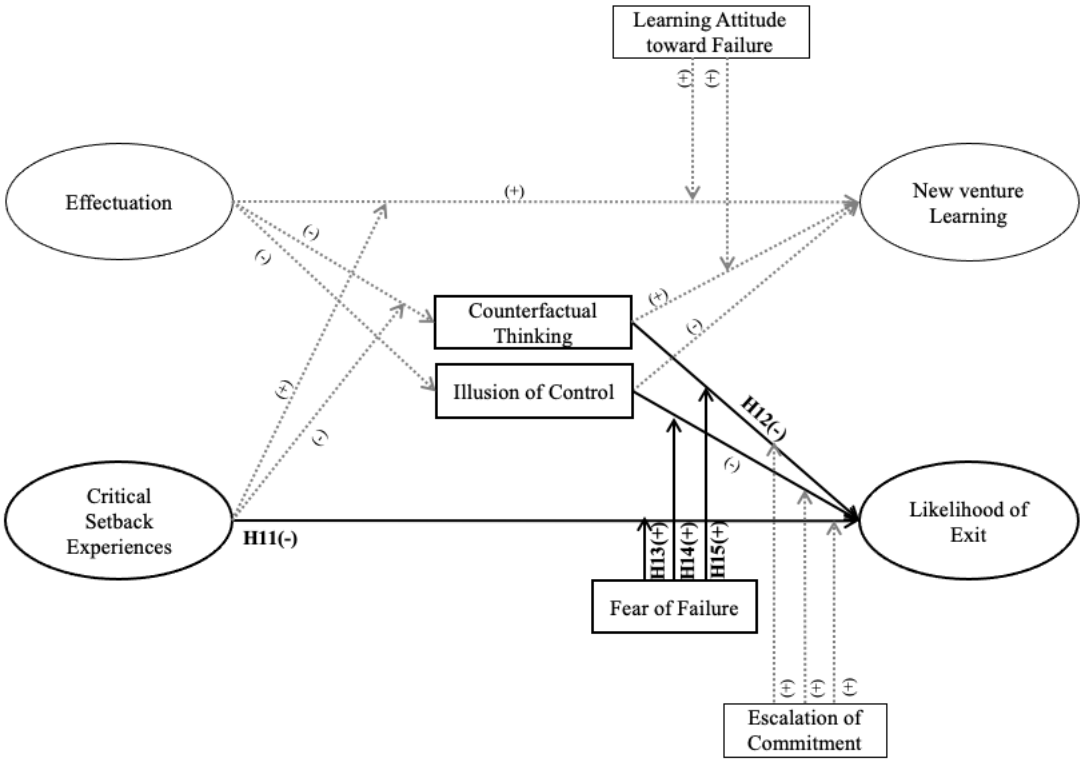

Figure 4:The Interrelationship among Critical Setback Experiences, Illusion of Control, Counterfactual Thinking, Fear of Failure, and Likelihood of Exit

Entrepreneurs often describe their ventures as their ‘‘babies,’’ expressing a personal connection and even identification with their businesses. Cardon et al. (2005) used a “parent and child’ metaphor to identify the challenges and emotions entrepreneurs are likely to face during the birth of their new ventures. The parenthood metaphor relates the experience of starting and growing a new venture to the experience of giving birth to and nurturing a child. According to this perspective, there are strong emotions and deep identity connections between entrepreneurs and their new ventures.

The strong attachment of the entrepreneur to his/her new venture can result in entrepreneurial behavior which does not seem logical from a rational point of view. For example, the entrepreneurs may persist on their entrepreneurial activities despite the venture’s poor

performance and may show a tendency to postpone any exit decisions. The parenthood metaphor also relates the new venture's failure to miscarriage and infant mortality and argues that such failure experiences can significantly influence the behavior of entrepreneurs after failure and in subsequent entrepreneurial activity.

The discussion about the deep connections existing between entrepreneurs and their ventures suggests that entrepreneurs would try hard to keep their new ventures afloat. In this study, I argue that the existence of barriers and critical setbacks in the entrepreneurial journey may trigger the pursuit of alternative or new solutions by the entrepreneur. Experiencing such barriers raises the entrepreneur's negative affect and develops the entrepreneur's perception of a potential failure.

Counterfactual thinking is also likely to enhance the entrepreneur's perception that failure is imminent. Prokopcakova and Ruiselova (2008), in their study on the occurrence and characteristics of counterfactual thinking, found out that counterfactual thinking results in negative emotions such as anxiety. These emotions are categorized as anticipated emotions that "are typically not experienced in the immediate present but are expected to be experienced in the future" (Loewenstein et al., 2001, p. 268). In other words, entrepreneurs feel anticipated emotions like anxiety. This means that the entrepreneur is not anxious yet, but any problems signal the likelihood of experiencing anxiety in the future. Anticipated emotions can create a sense of disappointment and regret arising from counterfactual comparisons (Bell, 1982, 1985; Loomes & Sugden, 1982, 1986; Mellers, Schwartz, Ho, & Ritov, 1997; Mellers, Schwartz, & Ritov, 1999) and prior experience.

When entrepreneurs perceive that a potential failure is likely to occur, their desire to save the business and to avoid failure increases. Experiencing critical setbacks simulates the

perception of failure. Although failure has not actualized, the entrepreneur perceives that it is likely to occur.

Psychological theory on avoidance and approach motivation (Atkinson, 1957; Birney et al., 1969; Elliot, 1999; Elliot and Church, 1997) and prospect theory (Alchian & Allen, 1977) explain why entrepreneurs decide to fight back the potential failure to prevent it from occurring.

According to psychological theory on avoidance and approach motivation, when entrepreneurs perceive a potential failure or receive threatening feedback regarding the performance of their new ventures, they become more motivated to put more effort into their venture and to explore more entrepreneurial opportunities (Mitchell & Shepherd, 2010; Wood, McKelvie, & Haynie, 2014). Prospect theory further explains this behavior and indicates that individuals become more insistent on actions which are framed with negative thoughts.

According to prospect theory, choices which are framed as losses create greater risk-taking behavior than choices that are framed as gains (Alchian & Allen, 1977). This theory centers around the concept of subjective value – gains or losses defined in terms of a reference point – and explains how individuals insist on pursuing a goal or completing a project which is either associated with negative thoughts or the feeling of taking risk (Kahneman and Tversky, 1979). In general, this theory indicates that when individuals find themselves in a potential loss situation, they insist on adopting behavior similar to what they have chosen in the past. Under such situations, individuals find it more difficult to quit and try to keep up a given course of action in order to change the potential outcome. According to these theories, counterfactual thinking, like critical setback experiences, may also result in a higher motivation to keep the business and strive to survive.

Considering these interpretations, I argue that both critical setback experiences and counterfactual thinking enhance the entrepreneur's motivation to avoid failure. These two factors – critical setback experiences and counterfactual thinking – reduce the likelihood that the entrepreneur exits the market. Therefore, I propose the following two hypotheses:

Hypothesis 11: Critical setback experience is negatively correlated with likelihood of exit.

Hypothesis 12: Counterfactual thinking is negatively correlated with likelihood of exit.

Entrepreneurship as an emotional journey, requires entrepreneurs to deal with a variety of entrepreneurial emotions (Baron, 2008; Cardon et al. 2012; Morris et al. 2012; Schindehutte et al. 2006; Cardon et al. 2012) that can positively or negatively influence their actions. Among the identified emotional elements that can work toward or against the entrepreneurial goal, scholars refer to fear of failure as one the most important drivers of entrepreneurial behavior (Arenius and Minniti, 2005; Koellinger et al., 2004).

Fear of failure refers to emotions such as distress or horror that can influence entrepreneurial decision-making (Cacciotti and Hayton, 2015; Morgan and Sisak, 2016). Fear stimulates changes in the brain's functions that result in various behavioral responses (Cacciotti and Hyton, 2015). A first response for the fearful individual may be fleeing from the cause of fear. This response may take the shape of escaping the situation physically (quitting) or else ignoring the situation mentally (withdrawing effort). Another fear response can be freezing in the situation without showing any reaction to the cause of the fear. A third type of response is to take an entirely different approach and face the fear of failure with the hope of overcoming it. When entrepreneurs decide to overcome the cause of the fear, they try to push hard to succeed and to avoid failure (Elliot & Church, 1997; Lazarus, 1991).

In the first two situations (escape and freeze), individual reactions to the cause of fear are restrictive and the fear prevents the individual from making a decision to initiate any activity such as starting a new business and beginning a new venture (Li, 2011; Patzelt and Shepherd, 2011; Welpe et al., 2012). Referring to this type of reaction to fear of failure, scholars in the field of entrepreneurship claim that fear of failure is a barrier to entrepreneurship. Existence of fear of failure can produce a negative impact on the ability of the individual to exploit opportunities (Arenius and Minniti, 2005; Kollmann, Stöckmann, and Kensbock, 2017; Langowitz and Minniti, 2007; Patzelt and Shepherd, 2011).

The third reaction, confrontation, indicates that fear may also trigger the passion to engage in a task to prevent failure (Atkinson, 1957; Elliot, 1997; Elliot and Church, 1997). Similar to the influence of critical setback experiences and counterfactual thinking, fear of failure triggers the motive to avoid failure. Psychological theory on avoidance and approach motivation indicates that fearful entrepreneurs have a higher tendency to overcome obstacles and to initiate entrepreneurial activity (Mitchell & Shepherd, 2010; Wood, McKelvie, & Haynie, 2014).

"The motive to avoid failure" (McClelland et al., 1953; Atkinson, 1957; Elliot and Thrash, 2004; Elliot, 2006) explains how fear of failure gives the individual the incentive to avoid it rather than feeling fearful and giving up the entrepreneurial activity. Entrepreneurs who feel fearful obtain the motivation to prevent failure. Fear triggers the perception of loss in the future. Therefore, fearful individuals take stronger attempts to prevent likely future losses or failures.

The perception of failure and threatened loss of new venture creates shame, another incentive for the entrepreneur to avoid failure. In fact, shame creates a negative feeling that triggers the tendency to avoid it in individuals. Scholars argue that entrepreneurs tend to avoid

failure to protect themselves from feeling shame (Atkinson, 1957; Birney et al., 1969). Shame experiences as extremely painful events cause individuals to see themselves entirely as failures (Lewis et al., 1992), unworthy, and in danger of being abandoned by others (Andrews, 1995). Shameful individuals mostly do not value themselves and their reactions and carry an in-depth fear of losing the people with whom they communicate such as their colleagues or friends. They might try hard to prevent this event from happening. They might put more effort into their actions in order to prevent themselves from being unworthy or losing others. As a result, shame starts to influence the way individuals think, feel, and act in other settings (Elliot and Thrash, 2004).

In the current study, I argue that entrepreneurs can turn the feeling of fear into an avoidance-based motive to achieve success. The entrepreneurs who have started their businesses have already overcome the fear of failure related to initiating an activity such as a new business. The nature of the fear of failure changes as the venture expands. After launch, an individual's attachment to the business begins to strengthen and impacts the decision-making process. Referring to the parenthood metaphor, entrepreneurs develop an intense attachment, connection, and commitment (Cardon et al., 2005; Gartner, 1990). The motive to avoid failure and the strong attachment described result in a much lower tendency to exit.

As discussed earlier, critical setback experiences, illusion of control, and counterfactual thinking reduce the likelihood of exiting business. These three relationships are enhanced if fear of failure appears. Relying on the aforementioned arguments, I propose the following hypotheses:

Hypothesis 13: Fear of failure positively moderates the relationship between critical setback experience and likelihood of exit in such a way that the higher the fear of failure

the stronger the negative relationship between critical setback experience and likelihood of exit.

Hypothesis 14: Fear of failure positively moderates the relationship between illusion of control and likelihood of exit in such a way that the higher the fear of failure the stronger the negative relationship between illusion of control and likelihood of exit.

Hypothesis 15: Fear of failure positively moderates the relationship between counterfactual thinking and likelihood of exit the business in such a way that the higher the fear of failure the stronger the negative relationship between counterfactual thinking and likelihood of exit.

Escalation of Commitment and the Likelihood of Exit

In this section, I argue that when counterfactual thinking, critical setbacks, or illusion of control appear and produce a negative impact on the likelihood of exit, escalation of commitment can strengthen the three negative aforementioned relationships.

Escalation of commitment is defined as the individual's tendency to invest more resources while negative outcomes are observed (Staw, 1981, 1997; Cardon et al., 2005). Human beings by nature tend to overestimate the possibility of positive outcomes and underestimate the probability of negative ones. They also tend to believe that they are outperforming others and are able to avoid unpleasant future events (Taylor and Brown, 1988).

Baron (2004) claims that when individuals frame a situation in terms of losses – perceiving that they are losing in a specific situation rather than winning – their tendency to seek risk increases. For instance, gamblers in a loss condition are more likely to continue playing the game and take more risks hoping to win back their losses. Prospect theory proposes that for any given magnitude, losses appear to be larger than gains in the perception of the individuals.

Therefore, individuals become risk-averse when gaining (winning) and risk-seeking while losing (Baron, 2002). This theory indicates that, individuals tend to overweight certain outcomes compared to uncertain outcomes. The theory explains that, certain losses are perceived to be greater than uncertain losses with the same value. In such a situation, people will choose uncertainty over certainty and consequently take more risk while they are experiencing loss (Whyte, 1986; Zardkouhi, 2004). As a result, failed strategies lead to higher persistence than success strategies (Whyte, 1986). Individuals who are in the negative frame condition, or are framing failure as a loss, are more likely to escalate their commitment to a course of action and to stick to the same goals, strategies, and decisions with the hope of changing the unpleasant mood or the unwilling outcome (Brockner, 1992).

The onset of counterfactual thoughts and critical setback experiences shows that results are falling short of expectations for the entrepreneur. When this happens, individuals go through a process of self-justification (Staw, 1981, Brockner et al., 1984; Brockner et al., 1986; Brockner, 1992). Self-justification perspective indicates that the need to protect and affirm the self-image (Steele, 1988) causes individuals to justify and rationalize their past behavior (Brockner, 1992). By following a retrospective rationality, individuals feel competent about the past and previously made decisions even if they fail (Staw, 1981). Self-justification can give the individual the perception that the situation is under control. Therefore, negative thoughts and feelings, instead of inhibiting the action, create the potential to move forward and to persist. Relying on the nature of escalation of commitment, self-justification theory and the prospect theory, I argue that escalation of commitment can further strengthen the tendency to stay in the business by moderating the relationship between counterfactual thinking or critical setback experiences and likelihood of exit. Therefore, I develop the following two hypotheses:

Hypothesis 16: Escalation of commitment positively moderates the relationship between critical setback experiences and the likelihood of exit in such a way that the higher the escalation of commitment, the stronger the negative relationship between Critical setback experience and likelihood of exit.

Hypothesis 17: Escalation of commitment positively moderates the relationship between counterfactual thinking and likelihood of exit in such a way that the higher the escalation of commitment, the stronger the negative relationship between counterfactual thinking and likelihood of exit.

Escalation of commitment can also influence the negative relationship between illusion of control and the likelihood of exit. As stated earlier, entrepreneurs with a high degree of illusion of control hold the perception that personal control is the only important factor to achieve expected outcomes (McKenna, 1993). Langer (1975) claims that the individual's tendency to control is implanted in human cognition and the greatest feeling of competence is achieved when the individual begins to control the seemingly uncontrollable. As a result, illusion of control explains persistent actions (Taylor, 1989; Staw, 1997). As I discussed earlier, the self-justification perspective and the viewpoint towards framing effects (loss versus gain) both imply that the individual is more likely to stay in the business when outcomes have not met the expectations and a perception of potential failure has appeared. In the discussion on illusion of control I explained that overemphasis on control reduces the likelihood of exit. According to the provided arguments, the negative relationship that exists between illusion of control and likelihood of exit can be reinforced if the entrepreneur carries the escalation of commitment bias. Therefore, I propose that:

Hypothesis 18: Escalation of commitment positively moderates the relationship between illusion of control and likelihood of exit such that the higher the escalation of commitment, the stronger the negative relationship between illusion of control and likelihood of exit.

Figure 5 illustrates hypotheses 16 to 18.

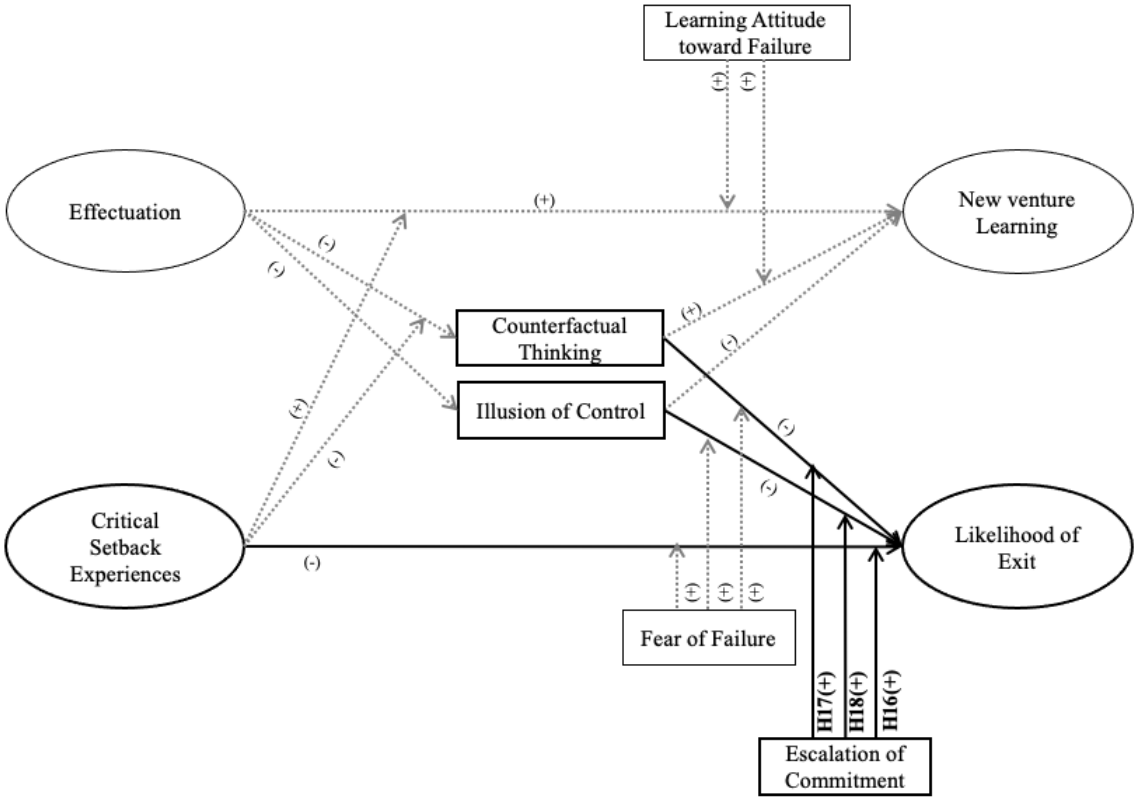

Figure 5:The Interrelationship among Critical Setback Experiences, Illusion of Control, Counterfactual Thinking, Escalation of Commitment, and Likelihood of Exit

Dissertation Research Model

Figure 6 illustrates the research model of the study.

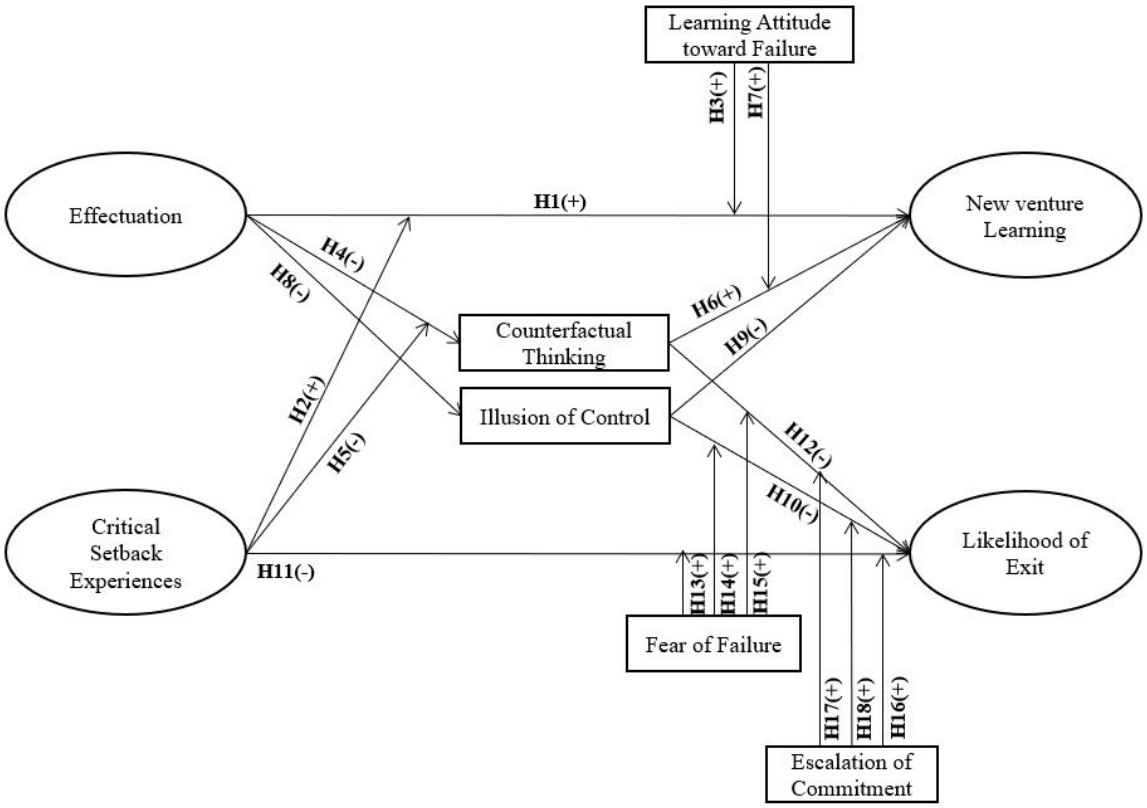

Figure 6: Research Model

Summary of the Hypotheses

Table 5: List of the Hypotheses and The Results in a Glance

#	Hypothesis	Supported?
1	Effectuation positively influences new venture learning.	Not Supported
2	Critical setback experience moderates the effect of effectuation on new venture learning such that the higher the critical setback experience, the stronger the positive relationship between effectuation and new venture learning.	Significant but *Negative* impact of moderating role of CSE
3	Learning attitude toward failure moderates the effect of effectuation on new venture learning such that the higher the learning attitude toward failure, the stronger the positive relationship between effectuation and new venture learning.	Not Supported
4	Effectuation negatively influences counterfactual thinking.	Supported
5	Critical setback experience negatively moderates the relationship between effectuation and counterfactual thinking in such a way that the higher the critical setback experience the weaker the negative relationship between effectuation and counterfactual thinking.	Not Supported
6	Counterfactual thinking positively influences new venture learning.	Significant but *Negative* impact of CT
7	Learning attitude toward failure moderates the relationship between counterfactual thinking and new venture learning in such a way that the higher the learning attitude toward failure the stronger the positive relationship between counterfactual thinking and new venture learning.	Supported
8	Effectuation is negatively related to illusion of control.	Not Supported
9	Illusion of control is negatively related to new venture learning.	Supported
10	Illusion of control is negatively related to likelihood of exit.	Supported
11	Critical setback experience is negatively correlated with likelihood of exit.	Significant but Positive impact of CSE
12	Counterfactual thinking is negatively correlated with likelihood of exit.	Significant but Positive impact of CT
13	Fear of failure positively moderates the relationship between critical setback experience and the likelihood of exit in such a way that the higher the fear of failure the stronger the negative relationship between critical setback experience and likelihood of exit.	Not Supported
14	Fear of failure positively moderates the relationship between illusion of control and likelihood of exit in such a way that the higher the fear of failure the stronger the negative relationship between illusion of control and likelihood of exit.	Supported
15	Fear of failure positively moderates the relationship between counterfactual thinking and likelihood of exit in such a way that the higher the fear of failure the stronger the negative relationship between counterfactual thinking and likelihood of exit.	Not Supported
16	Escalation of commitment positively moderates the relationship between critical setback experience and likelihood of exit in such a way that the higher the escalation of commitment, the stronger the negative relationship between critical setback experience and likelihood of exit.	Not Supported
17	Escalation of commitment positively moderates the relationship between counterfactual thinking and likelihood of exit in such a way that the higher the escalation of commitment, the stronger the negative relationship between counterfactual thinking and likelihood of exit.	Significant but Negative impact of EC on the positive relationship between CT and LExit
18	Escalation of commitment positively moderates the relationship between illusion of control and likelihood of exit in such a way that the higher the escalation of commitment, the stronger the negative relationship between illusion of control and likelihood of exit.	Supported

CHAPTER IV

RESEARCH METHODOLOGY

In this chapter, I explain how I have conducted the study and collected data necessary for investigating the hypotheses of my research. In this study, I have used a cross-sectional design to investigate the relationship among effectuation as the independent variable and two dependent variables: the likelihood of exit and new venture learning. As it is shown in the research model of the study, I have also examined how mediators such as counterfactual thinking and moderators such as escalation of commitment influence the proposed relationships between independent and dependent variables. Using data collected through a cross sectional research helps to determine the relationships between multiple variables. In general, a cross-sectional study design is often used when the researcher aims to find the prevalence of the outcome of interest for a selected sample at a given point in time (Dillman, 1978).

In this dissertation, I have selected my sample from the population of founders of new ventures functioning in the 48 contiguous states of the US. Later in this section, I provide information on how the size of the sample was calculated based on the items of the questionnaire since a large sample size is required to obtain reliable and valid research results.

Instrument of the Study

In order to address the questions of the current study, I have selected established and tested measures of the constructs and I have developed the instrument by combining these

established measures. No new measures of the instruments have been developed in this dissertation. In the following, the descriptions of these established measures and the reasons why I have selected them.

Measurements of Dependent Variables

My hypotheses examine how effectuation as a problem-solving style can influence new venture learning and the likelihood of exit when cognitive biases are in place and elements such as counterfactual thinking, fear of failure, and attitude toward failure are present. Therefore, this study has two dependent variables, one is new venture learning and the other one is the likelihood of exit. In the following, I have included the process by which each scale of dependent variables is selected.

New venture learning: In order to measure this construct, I have selected and modified the organizational learning scale developed by Zahra (2012). This scale is established based on a comprehensive review of the literature (Huber 1991; Pérez-Nordtvedt et al. 2008; Zahra et al. 2000) and includes three dimensions of organizational learning as: breadth, depth, and speed. As discussed earlier in chapter two, breadth refers to "the variety of fields (e.g., industries) and areas (e.g., technology and marketing) in which the firm acquires and masters underlying knowledge bases and structures". Depth refers to "the extent of a firm's mastery of the knowledge that it develops internally or receives from external sources." Speed of new venture learning refers to "the quickness of the firm in acquiring, processing, and understanding the knowledge gained from internal and external sources" (Zahra, 2012, p. 53). Zahra (2012) reported the Cronbach's alpha for breadth as 0.71, 0.70 for the depth, and 0.72 for the speed of organizational learning (See Table 6)

Table 6: Dimensions of Learning

Organizational learning	Breadth (α = 0.71)	How would you describe your company's ability to learn about the following issues over the past 3 years? For each item, please circle the one number that best describes your response. (five-point Likert scale from 1: little learning to 5: a great deal of learning) 1. Changes in your competition 2. Changes in your competitors' strategies 3. Changes in your industry 4. Changes in technological Conditions 5. Changes in demographics 6. Changes in the regulatory environment 7. Developing new products 8. Commercializing new products 9. Being responsive to customer needs 10. Responding quickly to competitive forces
	Depth (α = 0.70)	How thoroughly has your company analyzed the following issues over the past 3 years? For each item, please circle the one number that best describes your response. (five-point Likert scale from 1: Strongly disagree to 5: Strongly agree) 11. … causes of success & failure in the industry 12. … competitors' assumptions about the industry 13. … shifts in competitors' market positions 14. … lessons learned from strategy implementation 15. … competitors' intentions 16. … factors underlying technological changes 17. … analyzing factors underlying regulatory changes
	Speed (α = 0.72)	How would you describe the speed at which your company has been able to learn about the following issues over the past 3 years? For each item, please circle the one number that best describes your response. (five-point Likert scale from 1: Very slow to 5: Very fast) 18. Technological changes 19. Regulatory changes 20. Demographic changes 21. Political changes 22. Competitive changes 23. Market trends

Likelihood of exit: In their study on the influence of family resources on the immigrant entrepreneurs' exit from entrepreneurship, Bird and Wennberg (2016) considered two alternative

exit events: exit to unemployment and exit to paid employment (Taylor, 1999; Van Praag, 2003). In this study, exit from entrepreneurship into paid employment was coded 1 and exit from entrepreneurship into unemployment was coded 2, and self-employment survival was coded as 0. Relying on this perspective, I measured the likelihood of exit by modifying this three-item scale (scale from zero: "it is not likely" to 100 "it is very likely"). These items indicate the likelihood that the entrepreneur keeps the business, exits the business while looking for paid-employment jobs, or exits the business while trying to start a new venture. The items are phrased as follows:

24. What is the likelihood that you continue to run your venture with its current performance level?
25. How likely are you to exit the business due to the perception that it may fail?
26. What is the likelihood of exiting your business and looking for paid employment jobs?
27. What is the likelihood of exiting your business and starting a new venture?

Measurements of Independent Variables

In addition to the aforementioned dependent variables – new venture learning and likelihood of exit – this study includes six other variables which play the roles of independent variables, moderators, and mediators. In next paragraphs, I have explained how I have selected the scales measuring these six variables.

Causation and Effectuation: Most of the empirical research on this topic has either conducted experimental research designs by using think aloud verbal protocols of entrepreneurs during their decision-making (e.g., Dew et al., 2009; Sarasvathy, 1998; Sarasvathy et al., 1998) or performed field studies in order to gather and analyze qualitative data on causation and effectuation (Sarasvathy and Kotha, 2001; Sarasvathy and Dew, 2005; Harting, 2004). In 2011, Chandler et al. took a step forward and developed and validated quantitative measures of

causation and effectuation. The authors developed a coherent unidimensional measure of causation (α=.73) and a formative, multidimensional effectuation construct. A formative construct refers to a group of indicators (dimensions) which cause the construct, as opposed to reflective constructs within which the indicators are caused by the latent variable (Coltman et al., 2008).

For effectuation, the authors indicated that three associated sub-dimensions (indicators) exist: experimentation (α=.78), affordable loss (α=.85), and flexibility (α=.70). They also indicated another dimension called pre-commitments (α=.86) is shared with the causation construct. Chandler et al. (2011) developed the measure of causation and effectuation based on the four major differences that exist between the two constructs: first, focusing on short-term experiments to identify business opportunities in an unpredictable future (effectuation) versus defining final objectives by trying to prediction an uncertain future (causation), second, focusing on how much loss can be afforded (effectuation) versus maximization of expected returns (causation), third, emphasizing pre-commitments and strategic alliances to control an unpredictable future (effectuation) versus business planning and competitive analyses to predict an uncertain future (causation), and finally, exploitation of environmental contingencies by remaining flexible (effectuation) versus exploitation of pre-existing capabilities and resources (causation). After developing this measure, Chandler et al., (2011) tested it by using two samples of entrepreneurs in young firms. The items are provided in the following table and respondents are asked to answer on a five-point Likert scale, anchored by “strongly disagree” and “strongly agree.” the extent to which they agree with the given statements. Table 7 provides items to measure causation and effectuation constructs.

Table 7: Measure of Causation and Effectuation

Construct		The survey items
Causation (α=.73)		28. We analyzed long run opportunities and selected what we thought would provide the best returns. 29. We developed a strategy to best take advantage of resources and capabilities. 30. We designed and planned business strategies 31. We organized and implemented control processes to make sure we met objectives 32. We researched and selected target markets and did meaningful competitive analysis 33. We had a clear and consistent vision for where we wanted to end up 34. We designed and planned production and marketing efforts
Effectuation	Experimentation (α=.78)	35. We experimented with different products and/or business models. 36. The product/service that we now provide is essentially the same as originally conceptualized. (reverse coded) 37. The product/service that we now provide is substantially different than we first imagined. 38. We tried a number of different approaches until we found a business model that worked.
	Affordable Loss (α=.85)	39. We were careful not to commit more resources than we could afford to lose. 40. We were careful not to risk more money than we were willing to lose with our initial idea. 41. We were careful not to risk so much money that the company would be in real trouble financially if things didn't work out.
	Flexibility (α=.70)	42. We allowed the business to evolve as opportunities emerged. 43. We adapted what we were doing to the resources we had. 44. We were flexible and took advantage of opportunities as they arose. 45. We avoided courses of action that restricted our flexibility and adaptability.
Effectuation/ Causation	Pre-commitments (α=.86)	46. We used a substantial number of agreements with customers, suppliers and other organizations and people to reduce the amount of uncertainty. 47. We used pre-commitments from customers and suppliers as often as possible. 48. Network contacts provided low-cost resources. 49. By working closely with people/organizations external to our organization we have been able to greatly expand our capabilities. 50. We have focused on developing alliances with other people and organizations. 51. Our partnerships with outside organizations and people play a key role in our ability to provide our product/service.

Counterfactual thinking: To measure counterfactual thinking, I have followed the approach adopted by Baron (2000), Markman et al. (2002, 2005), and Arora et al. (2013). Based

on this measure, respondents are asked to think of up to three things they regretted most in their entire lives. This item shows the total number of regrets reported by participants (range= 0–3). Following that question, respondents are asked to rate on seven-point scales: the frequency which they engaged in counterfactual thinking for each one of these items (imagining the possibility that things might have turned out differently in various situations if they had acted differently or circumstances had been different), the intensity of regret they experienced as a result of thinking about each one of these missed opportunities, and their feelings (affective reactions) when they thought about missed opportunities. They reported Cronbach's alpha for the counterfactual thought scale to be 0.87 (Arora et al., 2013). The scale is provided in Table 8.

Table 8: Scale of Counterfactual Thinking

Counterfactual thinking (α = 0.87)	52. Consider the past three years, and list up to three events or actions that you regret most. Please confine your regrets to events or actions associated with your life as an entrepreneur (e.g., missed opportunities, unforeseen setbacks) (seven-point Likert scale) Regret A : ---------- Regret B : ---------- Regret C : ---------- 53. How often do you find yourself reflecting upon this regret? Regret A : Never ---------Sometimes--------All the time Regret B : Never ---------Sometimes--------All the time Regret C : Never ---------Sometimes--------All the time 54. How intense is your regret over this event or action? Regret A : Not at all ----------Somewhat--------Extremely intense Regret B : Not at all ----------Somewhat--------Extremely intense Regret C : Not at all ----------Somewhat--------Extremely intense 55. Describe how you feel emotionally when you reflect on this event or action Regret A : Extremely unpleasant ---------Neutral---------Extremely pleasant Regret B : Extremely unpleasant ---------Neutral---------Extremely pleasant Regret C : Extremely unpleasant ---------Neutral---------Extremely pleasant

Critical setback experience: Critical setback experience can trigger a search for alternative and new solutions to a problem (Cyert and March, 1963). Entrepreneurs may experience different setbacks and may start to believe that failure is likely to happen. To measure this construct, Politis and Gabrielson (2009) developed a six-item, five-point scale measure (Please see Table 8) based on prior theoretical work on traditional obstacles and problems that new ventures face when coping with the liabilities of newness in the early years of operations (e.g., Stinchcombe, 1965; Singh et al., 1986; Shepherd et al., 2000). Politis and Gabrielson, (2009) reported Cronbach alpha for this construct to be 0.76. This scale is the only available established measure of critical setback experience. Based on the context of my research, this scale is appropriate and I have used it to measure critical setback experiences. The items are provided in Table 9.

Table 9: Scale of Critical Setback Experiences

Critical setback experience ($\alpha = 0.76$)	Please rate the extent (1 = very low extent, 5 = very high extent) to which you have experienced any of the following critical setbacks in the process of creating your new venture. 56. developing a new product/service 57. finding competent employees for the new venture 58. communicating with external stakeholders 59. finding long-term finance for the new venture 60. finding a profitable market niche for a product/service 61. finding a customer base for a product/service

Illusion of control: This variable emphasizes on the respondents' certainty in their ability to master and predict difficult-to-control, future business events (Simon et al., 2000). In order to measure the illusion of control construct, I refer to the approach adopted by Simon et al. (2000). These authors measured illusion of control by using a three-item scale, which I provide in the following table. Simon et al. (2000) adopted two of these items from Langer and Roth's (1975) research in which the authors asked the respondents to predict certain uncontrollable outcomes

and took the third item from the study of Cooper et al., (1988). This item implies that the respondent believes his/her skills are greater than those of others (Cooper et al., 1988). Simon et al. (2000) reported the Cronbach's alpha of this measure to be 0.67 (Table 10). In this dissertation, I have adopted the measure of Simon et al. (2000). I have added four more items to this measure to improve the reliability. Table 11 shows all seven items I have used to measure illusion of control.

Table 10: Simon et al. (2000)'s Scale of Illusion of Control

Illusion of control (Simon et al., 2000) ($\alpha = 0.67$)	Please indicate to what extent you agree on the following statements (from 1="strongly disagree" to 5="strongly agree"). I believe I could . . . accurately predict total market demand for introducing new product accurately predict when larger competitors would enter the market succeed at making this venture a success, even though many other managers would fail

Table 11: Scale of Illusion of Control

Illusion of control	Please indicate to what extent you agree on the following statements (from 1="strongly disagree" to 5="strongly agree"). I believe I could . . . 62. I believe I could achieve great outcomes in my new venture/startup even if chance plays an essential role. 63. I believe I could control events even if chance plays an essential role. 64. I believe I could succeed at making this venture a success, even though many other managers would fail. 65. I believe I could succeed at making this venture a success, even though luck has something to do with it. 66. I believe I have great abilities to predict the future. 67. I believe I could accurately predict total market demand for introducing a new product. 68. I believe I could accurately predict when larger competitors would enter the market.

Most of the studies in the field of organizational behavior have used lab experiments to measure illusion of control. For instance, Benassi et al. (1979) conducted a lab experiment in one study and used "Paranormal Belief Scale" in a second study in order to measure illusion of control. Golwitzer and Kinney (1989) and Alloy and Clements (1992) took similar approaches

and conducted lab experiments and used "Judgment of Control Scale" to measure illusion of control.

The scale provided by in Table 11 is an appropriate scale for the purpose of my study for two basic reasons, first, my study is a survey-based field research therefore the previously conducted experiments are not suitable and second, the items developed for this scale are applicable to the research questions of my proposal.

Fear of failure: In my research, I adopted the approach of Kollman et al., (2017) to measure fear of failure. According to this approach, fear of failure is measured with five items (*Table 11*) included in the Achievement Motivation Scale (Gjesme and Nygard, 1970; Lang and Fries, 2006; Kollmann et al., 2017).

The reason for this selection is that, unlike numerous studies in the field of organizational research that have considered fear of failure as a barrier to entrepreneurship and therefore measured it with a single item (Arenius & Minniti, 2005; Langowitz & Minniti, 2007; Minniti & Nardone, 2007; Shinnar et al., 2012; Wagner, 2007), the five-item measure of fear of failure considers this construct as an ongoing phenomenon during entrepreneurial activity. Studies which considered fear of failure as a barrier to entrepreneurship has used the Global Entrepreneurship Monitor (GEM) database to measure fear of failure with a single item: "fear of failure would prevent me from starting a business" (Bosma et al., 2007: 11) and claimed that the only outcome of the fear of failure is not starting a new venture (Cacciotti et al., 2016).

In my dissertation, the target sample of the study is a group of entrepreneurs who have already started a business and are in the process of running a venture. These entrepreneurs have therefore overcome the fear of failure related to starting a new venture (fear of failure which is measured by one item). However, fear of failure as a general concern for entrepreneurs

influences them in overcoming barriers within the market and in survival. Kollmann et al. (2017) reported alpha as 0.83 for this scale (Table 12).

Table 12: Scale of Fear of Failure

Fear of failure (α = 0.83)	Please indicate to what extent you agree with the following statements. (1 = strongly disagree to 4 = strongly agree) 69. I am afraid of failing in somewhat difficult situations, when a lot depends on me. 70. I feel uneasy to do something if I am not sure of succeeding. 71. Even if nobody would notice my failure, I'm afraid of tasks which I'm not able to solve. 72. Even if nobody is watching, I feel quite anxious in new situations. 73. If I do not understand a problem immediately, I start feeling anxious.

Learning attitude toward failure*:* This construct is measured by two-item, five-point scale developed by Politis and Gabrielson (2009) based on a review of empirical work on failures in business settings (Sitkin, 1992; McGrath, 1999; Cannon and Edmondson, 2001; Cannon and Edmondson, 2005). A higher score on this scale indicates a more positive attitude to the act of failing. Cronbach alpha for this construct is reported as 0.66. The items are provided in Table 13.

Table 13:Scale of Learning Attitude Toward Failure

Learning attitude toward failure (α = 0.66)	Please indicate to what extent you agree with the following two statements. (1 = very low extent, 5 = very high extent) Failures give opportunities for reflection and consideration. Failures generally lead to positive outcomes in the long run.

For the purpose of this study and in order to improve the Cronbach's alpha, I added two items to the scale of learning attitude toward failure. I created these items based on the existing conceptual and empirical studies. One of these items refers to the direct influence of failure on learning and indicates that failure experiences are followed by improved learning ability of the individual. Using this item, I am investigating whether individuals perceive failure as a way of

learning or not. The second item refers to the creation of new opportunities as a result of fear of failure. Table 14 shows the four items of the measure of fear of failure in my proposal.

Table 14: Updated Scale of Learning Attitude Toward Failure

Learning attitude toward failure (α = 0.66)	Please indicate to what extent you agree with the following two statements. (1 = very low extent, 5 = very high extent) 74. Failures give opportunities for reflection and consideration. 75. Failures generally lead to positive outcomes in the long run. 76. Fear of failure leads to learning. 77. Failure can create new opportunities.

Escalation of commitment: To measure escalation of commitment in my research proposal, I adopted the scenario by DeTienne et al. (2008). In their study on reasons why underperforming firms persist to stay in the market DeTienne et al. (2008, p.538) developed a scenario to investigate "the decision to persist despite poor performance." This scenario targets the firm's existence and continuance of its performance. The scenario is as follows:

> *"Assume that the following conditions are true across all the scenarios you are about to encounter:*
> *You are the top decision-maker of a five-year-old firm with 75 employees currently experiencing poor performance relative to other firms in the industry. A selection of your performance measures suggests that sales are currently 20% below the industry average, net profit margin has declined three years in a row, and return on investment is the lowest in the industry."*
> *"Based upon the above seven dimensions of this currently poorly performing firm, what would your decision be regarding its future?"*

In this study, the dependent variable is collected on 11- point Likert scale anchored by "Definitely remain in the Market" and "Definitely Discontinue Operations." This scale was then reverse coded so that a higher score reflects a greater likelihood of persistence. This scenario targets the firm's existence and continuance of its performance while other scenarios investigate

whether projects within the firm, rather than the firm itself, will be continued. Therefore, I have chosen this scenario among various others.

In general, in the field of organizational behavior, scholars argue that escalation of commitment is about throwing good money after bad (Garland, 1990). As a result, in many research articles, escalation of commitment has been measured by considering further investments and the allocation of more resources when outcome falls short of expectations. Most of these studies have adopted the instrument for measuring escalation of commitment from "blank radar plane scenario" by Arkes and Blumer (1985) (e.g., Conlon & Garland, 1993; Garland, 1990; Garland & Conlon, 1998; Moon, 2001a). In 1993, McCarthy and colleagues assigned one task to two groups of respondents, one experimental group and one control group. The experimental group was supposed to make an initial decision, and the control group was not supposed to make any decisions; rather they were supposed to act based on the previously made decision given to them. Following this step both groups received negative feedback including an unpleasant result from the operator. Then, both groups were asked whether they are willing to make further investments although the results were unpleasant. The study indicated that the experimental group were significantly more likely to invest resources than the control group (McCarthy et al., 1993). Other scholars referred to the project completion as an alternative determinant of escalation of commitment that can replace the sunk costs (investment of more time and money) (Conlon & Garland, 1993; Garland & Conlon, 1998). Moon (2001a) challenged this idea and indicated that sunk costs and the level of project completion are both important determinants of escalation of commitment. Moon (2001b) asserted that escalation situations are defined by three elements: First, large amounts of resources have been already invested, second, performance has not met expectations and there is a danger of failure, and third, the decision

maker is in the dilemma of continuing by allocating more resources or terminating the project. Based on the "blank radar plane scenario" by Arkes and Blumer (1985), participants are asked to carefully read, evaluate, and answer questions related to the scenario.

"Blank radar plane scenario" (Arkes and Blumer, 1985):

> *You are the Vice President of Operations for a mid-sized high-tech manufacturing firm. You have spent 1 (0, 5, or 9) million dollars and 6 (0, 18, or 32) months towards a research project to develop a radar-scrambling device that would render a ship undetectable by conventional radar, in effect, a radar-blank ship. So far, you have invested a small (moderate or large) amount of funds, and time, compared with the 10 million dollars and 3 years normally budgeted for these types of projects.*
>
> *The engineering department has informed you that the project is 10 (90) % complete.*
>
> *You have just discovered that another firm has already begun marketing a similar product that takes up less space and is much easier to operate than your design. The decision you face now is to either abandon the project or authorize the next 1 million from the budget to continue this radar scrambling research project.*
>
> *On the basis of this scenario, please determine (on a scale of 0 to 100) the extent to which you would continue investing in the aforementioned project.*

The scenario by Arkes and Blumer (1985) which also has been used by other scholars, focuses on two determinants of escalation of commitment: sunk costs and project completion. Therefore, different variations of the scenario are being distributed among the respondents and the results show that sunk costs and completion of the project can predict the escalation of commitment. In the second scenario by DeTienne et al. (2008), rather than focusing on sunk costs (time and money) and the completion of the project and instead of manipulating these variables, the focus is on escalating behavior while the decision maker receives negative feedback.

As discussed above, the approach of DeTienne et al. (2008) is more applicable and relevant to my research. Although the authors have not referred to this scenario as a measure of escalation of commitment, this scale evaluates the tendency to keep the business and stay in the market. Therefore, I used this scenario to measure escalation of commitment. The question asked at the end of this scenario is about staying in the market or leaving. To investigate whether study subjects decide to invest more in the business or not, I included the question asked in the first scenario as well. In fact, by adding this question, I tend to figure out whether some entrepreneurs would like to keep their businesses without investing more. Therefore, the following scenario and items will be included in the instrument:

> *"Assume that the following conditions are true across all the scenarios you are about to encounter: You are the top decision-maker of a five-year-old firm with 75 employees currently experiencing poor performance relative to other firms in the industry. A selection of your performance measures suggests that sales are currently 20% below the industry average, net profit margin has declined three years in a row, and return on investment is the lowest in the industry."*
>
> *Based upon the above seven dimensions of this currently poorly performing firm, what would your decision be regarding its future?*

78. Based upon the above seven dimensions of this currently poorly performing firm, what would your decision be regarding its future? (11- point Likert scale anchored by "Definitely remain in the Market" and "Definitely Discontinue Operations.")
79. Please determine (on a scale of 0 to 100) the extent to which you would continue investing in the aforementioned venture.

Control Variables

I controlled for several variables that have been found to be important in prior studies of learning and entrepreneurial exit, decision-making, and cognition.

Gender. This variable is important for explaining different exit patterns since female entrepreneurs are more likely than male entrepreneurs to exit from entrepreneurship (Bird and Wennberg, 2016) and studies have also shown that males and females are not following exactly same patterns of decision-making regarding effectuation and causation; female entrepreneurs are more likely to follow effectuation logic than male entrepreneurs (e.g., Frigotto and Della Valle, 2016; Shao, 2012). I measured Gender as a dichotomous variable, taking the value 1 for female entrepreneurs and 0 for male entrepreneurs.

Entrepreneur's age. As individual entrepreneurs age, they may have different perspectives on life and the way they should deal with problems. Research in the field of entrepreneurship shows that age can make different contributions to entrepreneurial journey. For instance, Rai (2008) found that founder's age is a major determinant of the form of the new venture and the financial capital structure of small businesses. Wach (2014) also found that motivation to go global differs among entrepreneurs at different ages. Therefore, in this study, age is also included as a control variable to find out if there is any difference between the cognitive processes of entrepreneurs under study within different age groups.

Years/level of education. Formal education may provide skills that prove to be useful for entrepreneurship (Davidsson and Honig, 2003). A high level of education may increase learning ability (Resnick, 1987) however it may also increase the likelihood of exiting from entrepreneurship since other attractive employment opportunities are available (Gimeno et al., 1997). I measured education as the number of years that the entrepreneurs have obtained as well as the highest level of school they have completed (the highest degree they have received). Less than high school degree is coded as 0; high school degree or equivalent (e.g., GED) is coded as

1, some college but no degree is coded as 2; Associate degree is coded as 3; Bachelor's degree is coded as 4; and Graduate degree is coded as 5.

Entrepreneurial experience. The underlying assumption behind entrepreneurial experience is that the individual can transfer knowledge from one entrepreneurial setting and apply it to a new start-up (Taylor, 1999). To measure start-up experience, I followed the work of Dyke et al. (1992) which measured experience as the total number of new ventures that the respondent has been involved in. A higher score on this scale indicates greater start-up experience.

Marital status. Marriage indicates that an individual has a close and intimate social relationship with another person (Renzulli et al., 2000). Earlier research has shown that being married influences the likelihood of exit from entrepreneurship (Taylor, 1999). In many cases the entrepreneur's spouse's different perspective or different risk-taking attributes have resulted in conflicts regarding the question of whether to continue the business. Other reasons such as having kids for female entrepreneurs have been cited for discontinuation of the new venture. Thus, I also controlled for the marital status. The variable takes the value 1 if the entrepreneur is married and 0 otherwise.

Business closure experience. Business closure is defined as a situation in which a business entity discontinues in its existing form (Stokes and Blackburn, 2002) and is measured as the total number of business closures that the respondent has experienced. To distinguish between different kinds of business closure experience, I follow the approach adopted by Politis and Gabrielsson (2009) and ask respondents to rate whether they have experience of closing down a business with respect to the following reasons (Watson and Everett, 1993; Stokes and Blackburn, 2002). These reasons help to understand if the business closure is a result of the

entrepreneur's personal life, cognitive processes, lack of resources, or failure in terms of not being profitable. Respondents were asked to choose between the following options, and they could choose multiple options if relevant.

- Problems with making the business profitable.
- Difficulties in acquiring necessary resources.
- The business performed under expectations.
- Bankruptcy due to insolvency.
- To prevent further economic losses.
- Private reasons, such as ill health, family, etc.
- Alternative career opportunities, such as a job offer.
- Problems to keep up with the fast development on the market.
- A deliberate intent to continue with another venture.

Number of partners. Respondents were asked to indicate the number of partners they have if any as the co-founders of the new venture. The reason for including the number of partners is that existence of co-founders or entrepreneurial partners can influence the individual's decisions in general and their exit decisions in particular (Zahra et al., 1997).

New venture's age. The age of the new venture is likely to impact entrepreneurial decisions (Zahra et al., 1997). In addition, it also may influence the learning speed of the organization. Therefore, I have asked the entrepreneurs to indicate the age of the new venture.

New venture's size. Size is measured as the total number of employees.

Performance of the new venture. I also collected data related to return on assets as an appropriate and objective measure of performance (Arthurs et al., 2009).

Target Population and Survey Procedure

The target sample of this study is the founders of high technology new ventures operating in the 48 contiguous states of the USA. In this dissertation, I have used email surveys. The procedure used in the email survey is adopted from the Total Design Method created by Dillman (1978) for mail surveys. According to this method, a questionnaire, including a cover letter and a postage-paid return envelope, should be sent to respondents. Following this step, 1 week after the initial mailing, the researcher should send a postcard as a reminder to the non-respondents. Three weeks after the initial mailing, a follow-up letter with another copy of the questionnaire will be sent to subjects who have not responded. To encourage a response (Dillman, 1978), participants will also be told that a copy of the aggregated survey results would be sent to them.

I followed a similar approach for the email surveys. I sent an email survey to entrepreneurs' personal or business email addresses including a page that explained the purpose of the study (similar to the cover letter used in mail surveys). A reminder email was sent to respondents one week later. A second reminder was sent three weeks after the initial survey. Following Dillman's Total Design Method, I informed the respondents that they will receive a copy of the aggregated survey results after the study is complete.

Sample Demographics

To reduce the cultural challenges and struggles new ventures all over the world may face, I only included new ventures that are performing nationwide. I have chosen to study new ventures due to their high rates of failure among entrepreneurial firms (Cooper et al., 1989; Headd, 2003; Knott & Posen, 2005; Peng et al., 2010; Wiklund et al., 2010). In addition, the challenges and obstacles new ventures face are different from those of the established firms.

Eventually, failure of new ventures would be substantially different from failure of established firms.

Scholars define new ventures as the end result of the process of creating and organizing a new business that develops, produces, and markets products or services to satisfy unmet market needs for the purposes of profit and growth (Chrisman, Bauerschmidt, & Hofer, 1998; Gartner, 1985; Sandberg & Hofer, 1987). They argue that a venture is new if it has not yet reached a phase in its development where it could be considered a mature business. The length of time it takes for a new venture to mature will vary depending on factors such as its industry, resources, and its strategy (Chrisman et al., 1998). Accordingly, the earliest time that such a maturity level can be achieved would be three to five years after the venture's creation, and not until the venture is eight to twelve years old (Biggadike, 1979; Kazanjian & Drazin, 1990). Scholars also argue that a new venture can take several forms: as a joint venture between two or more established firms; as a corporate venture initiated as a self-contained organizational unit within the boundaries of an established company; or as an independent venture initiated and controlled by one or more individuals acting in their own self-interest (Vesper, 1980) and each one of these types possesses some unique characteristics with respect to ownership, genesis, and purpose (Borys & Jemison, 1989; Gartner, 1985; Katz & Gartner, 1988).

In this research, I have included new ventures that are five years old or younger, are independent ventures (not a joint or corporate venture), and are initiated by one or more individuals. The reason I have chosen to study only five-year old or younger ventures is that scholars believe after the age of five new ventures are getting mature and developed (Biggadike, 1979; Kazanjian & Drazin, 1990). They believe that at this point, the venture has reached the point of stability and has overcome the "liability of newness" discussed by Stinchcombe (1965)

(Chrisman et al., 1998). Therefore, its strategic direction can change as the venture transits from immaturity to establishment.

I purchased the contact information of the entrepreneurs from Dun & Bradstreet, Inc., which is a company that provides commercial data, analytics and insights for business, headquartered in New Jersey, US. Dun & Bradstreet Inc. provides information on many industry sectors.

In this research, I have investigated the entrepreneurs who are performing in the "high-technology" sector. The reason for this selection is that there is a high level of competition in this sector and although there are not many barriers to entry, it is very difficult for the entrepreneur to perform and succeed in this sector. In addition, although these entrepreneurs might succeed initially, being innovative is always a requirement to survive. A huge number of entrepreneurs who would like to start a business especially those with an engineering background, consider entering into this sector. Often, they might need to exit shortly after starting their new venture.

The survey of this study contains 79 questions. According to Kerlinger, Lee, and Bhanthumnavin (2000), in order to get valid results in survey research, each question of the study should be asked from five to ten individual respondents. Therefore, I sent the survey to 4451 entrepreneurs in order to receive an adequate number of completed questionnaires. And eventually the response rate was 8%.

Analysis Plan

To analyze data, I used ordinary least squares (OLS) regression test to estimate the model parameters. In order to do so, I followed the Hayes (2018)'s approach and used one of the SPSS macros, called "PROCESS" which is "a computational tool for observed variable path analysis-based moderation and mediation analysis as well as their integration as conditional process

analysis" (Hayes, 2018, p. 551). PROCESS is designed to estimate model coefficients, standard errors, t- and p-values, and confidence intervals using ordinary least squares regression. It also generates direct and indirect effects in mediation models, conditional effects in moderation models, and conditional indirect effects in conditional process models with a single or multiple mediator(s). This macro includes various methods for probing two- and three-way interactions and construct percentile bootstrap and Monte Carlo confidence intervals for indirect effects.

Compared to other macros such as INDIRECT (Preacher and Hayes, 2008), MODMED (Preacher et al., 2007), SOBEL (Preacher and Hayes, 2004), or MODPROBE (Hayes and Matthes, 2009) which have been designed to do specific tasks, PROCESS is a new macro integrates most of the functions of earlier macros into one command. PROCESS offers various preprogrammed mediation, moderation, and conditional process models which are specified in its command by model number. These models are also editable and modifiable. For this study, I created "three sub-models" of my research model presented in section 3.2. Combining these three sub-models will establish the original research model of the study. I compared each one of these three sub-models to the preprogrammed models provided by PROCESS and I selected the most compatible models to do further investigations. Figures 7 to 9 depict the three sub-models of my dissertation.

I used sub-model 1 to test the relationship between effectuation and new venture learning by considering two mediators of counterfactual thinking and illusion of control and two moderators of critical setback experiences and learning attitude toward failure. Sub-model 2 was considered to test the relationship between effectuation and likelihood of exit by including the impact of two mediators of counterfactual thinking and illusion of control on this relationship and three moderators: critical setback experiences, fear of failure, and escalation of commitment.

I used the last sub model to study the direct influence of critical setback experiences on likelihood of exit by including two moderators: fear of failure and escalation of commitment.

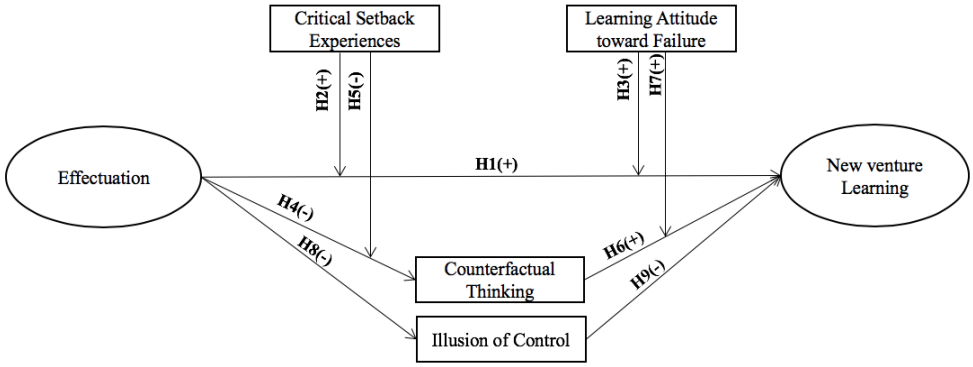

Figure 7: Sub-Model 1 Compatible with PROCESS Model 29

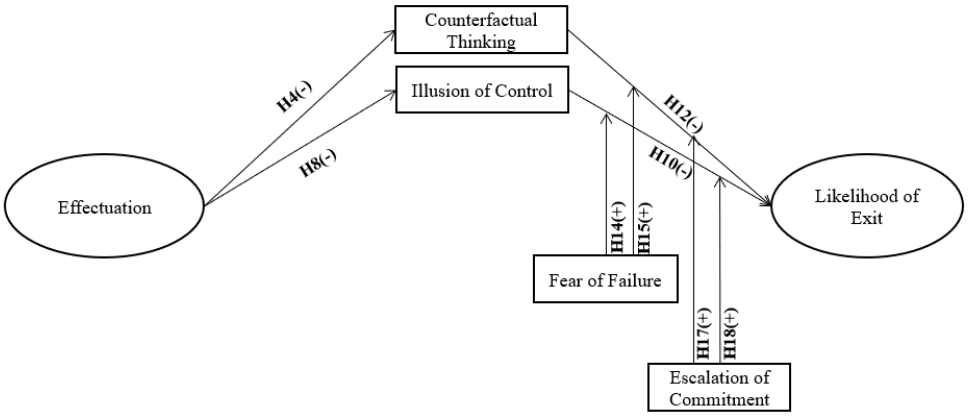

Figure 8: Sub-Model 2 Compatible with PROCESS Model 16

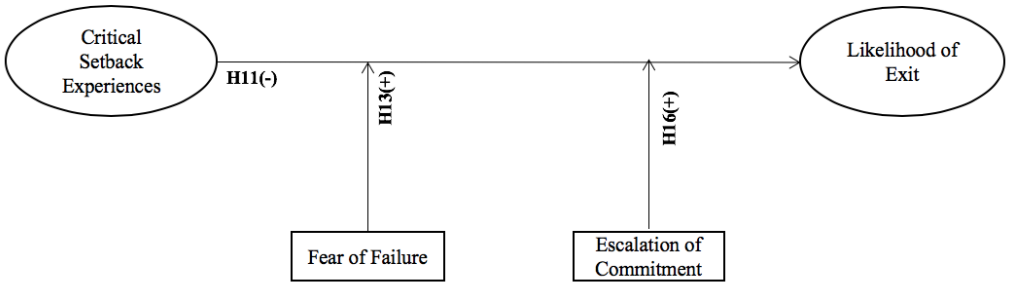

Figure 9: Sub-Model 3 Compatible with PROCESS Model 2

Among the preprogrammed Models of PROCESS, Models 29, 16, and 2 are compatible with sub-models 1, 2 and 3 respectively. Figures 10 to 12 show the aforementioned PROCESS models.

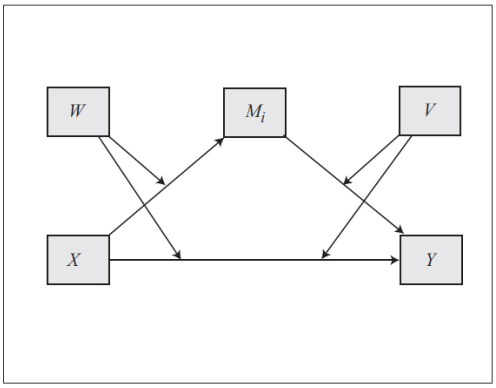

Figure 10: PROCESS Model 29

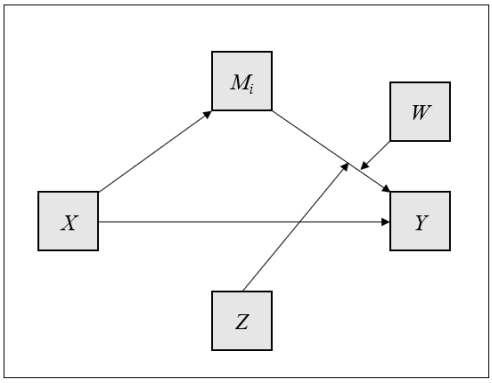

Figure 11: PROCESS Model 16

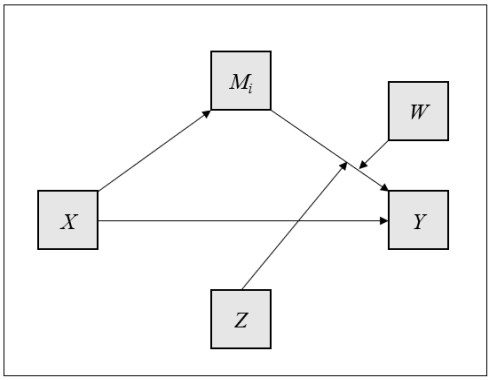

Figure 12: PROCESS Model 2

Following Hayes (2018)'s recommendation, I used bootstrapping to analyze mediation. Compared to Sobel's test, which is also used to test mediation, bootstrapping method does not assume any shape for the sampling distribution of the multiplication of the effect of independent variable on the mediating variable (a) and the effect of mediating variable on dependent variable (b). In Sobel's test, sampling distribution of ab is assumed to be normal. Therefore, bootstrap confidence intervals would better consider the sampling irregularity of "ab" and consequently holds inferences that are more likely to be accurate. The PROCESS macro automatically constructs a bootstrap confidence interval for any indirect effect it generates in any model it can estimate.

In addition, I used the PROCESS macro to do a pairwise comparison test between indirect effects of the parallel mediators of my research to investigate whether one indirect effect is statistically different from another. For instance, is the specific indirect effect of effectuation on learning through counterfactual thinking different from the specific indirect effect through illusion of control? It will help to further investigate the theories behind the indirect effects hypothesized in my study.

In chapter V of this dissertation, I have provided the results of the study based on the aforementioned analysis and tests and conclusions and recommendations have followed.

Summary of the Chapter

In this chapter, I provided details regarding the measurement of the study and the reason why each one of the scales have been selected to collect data on variables such as effectuation, escalation of commitment, illusion of control, entrepreneurial exit, and new venture learning. I also provided information on the population and sample of the study. As mentioned earlier, the survey will be sent to 2000 entrepreneurs of new ventures nationwide. New ventures must have

the age of five years old or younger. Later in the chapter, I also provided a brief summary of the analysis plan.

In following chapter, I have described the results of the study. Discussion and conclusion have been included in the last chapter of this dissertation.

CHAPTER V

DATA ANALYSIS AND RESULTS

In this chapter, I have provided the analysis of my study and reported the results. For this dissertation, I relied on ordinary least squares (OLS) regression to estimate the model parameters. For doing so, I have used SPSS PROCESS macro and found support or lack of support for aforementioned hypotheses of the study.

For the ease of communication, I have abbreviated the variable names in some of the tables. The list of abbreviations and what each one stands for are as follows:

- CAUS: Causation
- EFFEX: Effectuation Experimentation
- EFFAL: Effectuation Affordable Loss
- EFFF: Effectuation Flexibility
- EFFCAUS: Common effectuation and causation items
- EFFECT (*Independent Variable*): Effectuation (the mean of EFFEX, EFFAL, EFFF, and EFFCAUS)
- CTF: Counterfactual Thinking Frequency
- CTI: Counterfactual Thinking Intensity
- CTE: Counterfactual Thinking Emotion
- CT (*Mediator I*): Counterfactual Thinking (the mean of CTF, CTI, and CTE)
- IC (*Mediator II*): Illusion of Control
- CSE (Moderator I): Critical Setback Experiences
- LAF (Moderator II): Learning Attitude toward Failure
- EC (*Moderator III*): Escalation of Commitment
- FF (*Moderator IV*): Fear of Failure
- LB: Learning Breadth
- LD: Learning Depth
- LS: Learning Speed
- LEARN (*Dependent Variable I*): New Venture Learning (the mean of LB, LD, and LS)

- LEXIT (*Dependent Variable II*): Likelihood of Exit

In following paragraphs, I have first provided the descriptive analysis. Then, I have explained the technique I used to treat missing data. Following that, the results of the analyses of three sub models of the study (sub models 1,2, and 3) which based on PROCESS macro models 29, 16, and 2 have been provided. Before moving on to the next chapter of this dissertation, I have conducted more analyses to unveil any underlying or overlooked relationships that might exist among variables of the study. In the next chapter of this dissertation (Chapter 6: Discussions and Conclusion), I have provided the interpretation of the results and implication of the study.

Missing Data Treatment: Maximum Likelihood Method

In this dissertation, I followed Newman (2014) guidelines to deal with missing data. According to Newman (2014), Item-Level missingness can be addressed by including even one item in a multi-item scale whether the researcher is conducting an item-level analysis such as factor analysis or a construct-level analysis. If a participant responds to any items (even a single item) from a multi-item scale, then the participant's average response across the item(s) answered should be used to represent the participant's scale/construct score.

To conduct the analysis, I included the responses of the individuals who have answered to at least 30% of the question on the survey and have also responded to every single construct (referred to as full respondents). I omitted partial respondents who have not answered to more than 30% of the items on the survey and in the case of the current research, partial respondents were those who started the survey and submitted the survey but have left around 70% of the survey blank. Following this selection, I used Newman (2014) framework to select among available missing data treatments.

Based on the framework provided by Newman (2014), it is recommended to use Item-Level maximum likelihood (ML) or multiple imputation (MI) in my dissertation. As a first step in data analysis, I conducted MCAR (Missing Completely At Random) test. If data is missing completely at random, then using ML or MI techniques to compute summary estimates for missing items will be fully unbiased and will produce accurate standard errors (Newman, 2014).

Maximum Likelihood method directly estimates parameters of interest from incomplete data matrix; or compute summary estimates [means, SDs, correlations] (e.g., EM algorithm), then it is possible to proceed with analysis based on these summary estimates. This method, which is unbiased under MCAR and MAR, improves as researcher adds more variables to the imputation model. In this technique the number of variables should be < 100.

In following I have provided the results of MCAR test using Expectation Maximization Technique. The results of Little's MCAR test indicates that Significance level is 0.097 which is bigger than 0.05. Therefore, this insignificant result shows that data is missing completely at random and I can conclude that according to Newman (2014), Maximum Likelihood method is a great choice to address data missingness in this dissertation. Following this test, I implemented Expectation Maximization (EM) technique to compute summary estimates and proceed with analysis based on these summary estimates (Please see Appendix III). The final sample size was 397 after computing summary estimates and the response rate was 8%.

Table 15: MCAR Test Result

EM Means[a]									
CAUS1	CAUS2	CAUS3	CAUS4	CAUS5	CAUS6	CAUS7	EFFEX1	EFFEX2R	EFFEX3
5.14	5.76	5.66	4.77	5.32	5.63	5.35	5.01	2.71	3.86
EFFEX4	EFFAL1	EFFAL2	EFFAL3	EFFF1	EFFF2	EFFF3	EFFF4	EFFCAUS1	EFFCAUS2
4.67	5.06	4.74	5.01	5.91	5.77	6.21	5.38	4.69	4.56
EFFCAUS3	EFFCAUS4	EFFCAUS5	EFFCAUS6	CTF1	CTF2	CTF3	CTI1	CTI2	CTI3

5.12	5.37	5.77	5.53	3.39	3.33	3.57	3.75	3.99	4.07
CTE1	CTE2	CTE3	IC1	IC2	IC3	IC4	IC5	IC6	IC7
3.18	3.27	3.2	4.11	3.64	4.08	4.02	3.05	2.91	3.03
EC1R	EC2	LB1	LB2	LB3	LB4	LB5	LB6	LB7	LB8
61.26	50.37	4.01	3.69	4.21	4.2	3.31	3.59	4.11	3.91
LB9	LB10	LD1	LD2	LD3	LD4	LD5	LD6	LD7	LS1
4.34	3.84	4.91	4.61	4.8	5.49	4.41	5.42	4.57	4.28
LS2	LS3	LS4	LS5	LS6	CSE1	CSE2	CSE3	CSE4	CSE5
3.44	3.24	3.4	3.95	4.11	3.18	3.42	2.6	3.24	2.96
CSE6	LEXIT1R	LEXIT2	LEXIT3	LAF1	LAF2	LAF3	LAF4	FF1	FF2
2.97	15.91	10.74	15.21	4.53	3.99	4.68	4.4	2.47	2.22
FF3	FF4	FF5							
2.05	1.95	1.87							

a. Little's MCAR test: Chi-Square = 2610.517, DF = 2518, Sig. = .097

Computation of Variables

The first step in conducting the analysis was computing variable composites. This computation is constructed by either creating the “means of the items” or the “means of means”. For instance, Effectuation which consists of four sub constructs – experimentation, affordable loss, Flexibility, and Pre-commitment – is calculated as the average of the means of each one of the sub-constructs. This method is recommended by Chandler et al. (2011) to measure effectuation in its general term. Other constructs of the study have been measured in a similar vein. Learning also consists of three sub-constructs – Breadth, Depth, and Speed. To produce more accurate results, I have conducted the analysis once with learning as “means of means” of these three sub-constructs and three times with the means of each one of these sub-constructs.

Data Analysis Relying on Ordinary Least Squares (OLS) Regression

Test 1: Analysis of the Relationship Between Effectuation and New Venture Learning Using PROCESS Model 29

In following, I tested the first sub-model of my dissertation research model depicted below (Figure 13). As mentioned in Chapter III, this sub-model is compatible with Model 29 of PROCESS macro. In this model, Learning is computed as the means of the means for three dimensions of learning: breadth, depth, and speed.

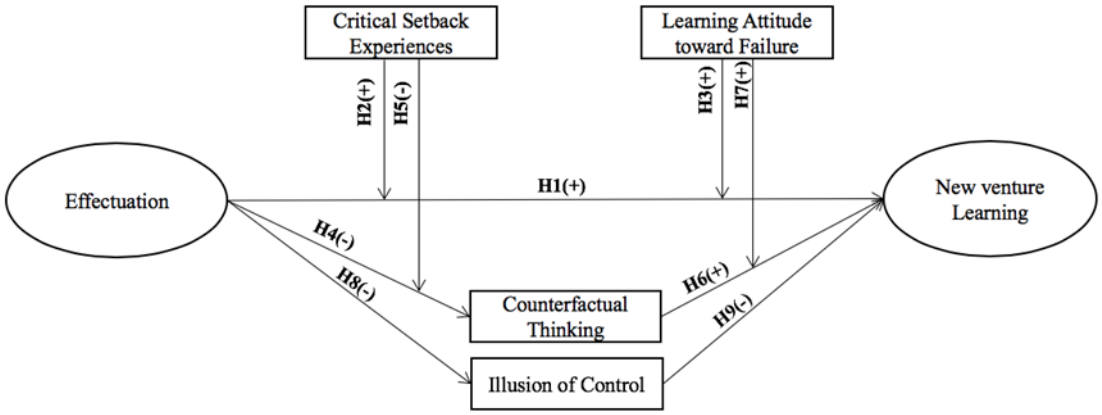

Figure 13: Sub-Model 1 Compatible with PROCESS Model 29

Conducting ordinary least squares path analysis by using PROCESS Macro Model 29, I found out that effectuation does not directly influence new venture learning (Table 16). However, existence of critical setback experiences as the moderator of this relationship, results in a significant correlation between effectuation and new venture learning.

To clarify how critical setback experiences as the moderator influence the relationship between effectuation and New Venture Learning, I have plotted the moderation graph (figure 14). This graph is created using the PROCESS Macro output. Process gives the option to get data at one standard deviation above and below the mean and this can be used for visualizing the

conditional effect of the focal predictor. This part of the PROCESS output helps to create the scatterplot of the points and using other graphical tools such as excel, or MATLAB, makes it possible to plot the moderation effect (Hayes, 2018).

According to Figure 14, when the number of critical setback experiences is low, there is a positive correlation between effectuation and new venture learning. When the number of critical setback experiences is high, there is a negative correlation between effectuation and new venture learning.

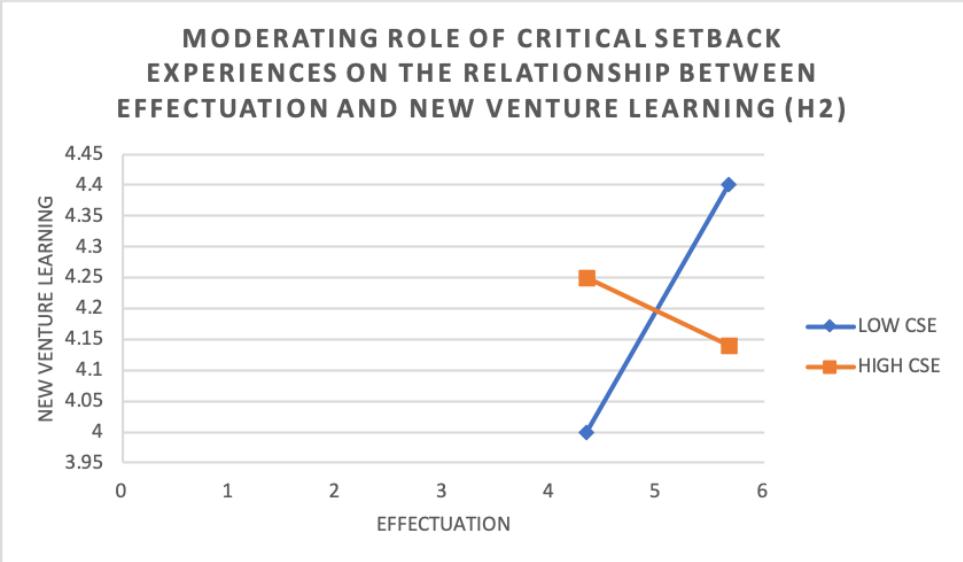

Figure 14: Moderating role of CSE on the relationship between Effectuation and New venture learning

The results of the study show support for hypothesis 4 (Table 18), indicating that effectuation is negatively correlated with counterfactual thinking. Therefore, highly effectual entrepreneurs are less involved in counterfactual thoughts. The results also reveal that counterfactual thinking is negatively correlated with learning. This finding contrasts the proposed hypothesis 6 which predicted a positive relationship to exist between counterfactual thinking and new venture learning. In addition, the analysis determined that Learning Attitude toward Failure (LAF) significantly moderates this relationship. To find direction of this

moderation effect, I plotted its graph using Process output data for visualizing moderation (Figure 15) and I found out that, when LAF is high, counterfactual thinking positively influences learning. But, when LAF is low, there is a negative relationship between counterfactual thinking and new venture learning.

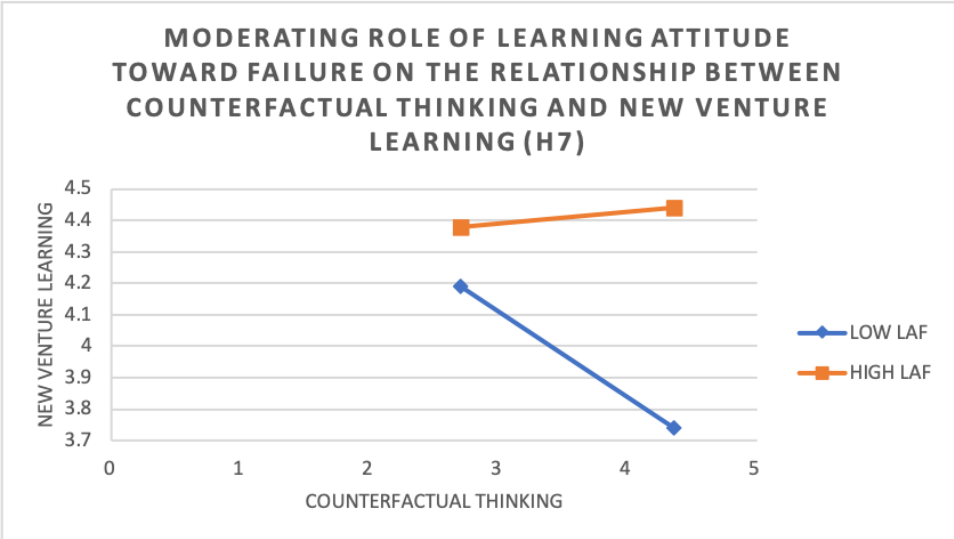

Figure 15: Moderating role of LAF on the relationship between CT and New Venture Learning

The findings of the study show support for hypothesis 9 and indicate that there is a significantly negative relationship between illusion of control and new venture learning.

Table 16: Regression Results for PROCESS Macro Model 29 – New Venture Learning as Outcome Variable

Predictor	B	SE	t	P
	New Venture Learning			
Constant	9.8746	4.0841	2.4178	0.0161
Effectuation (EFFECT)	0.2228	0.4497	0.4955	0.6205
Counterfactual Thinking (CT)	-1.2324	0.4507	-2.7346	0.0065
Illusion of Control (IC)	-1.2241	0.4119	-2.9720	0.0031
Critical Setback Experiences (CSE)	1.1901	0.2798	4.2535	0.0000
Learning Attitude toward Failure (LAF)	-2.0944	0.8767	-2.3889	0.0174
EFFECT x CSE	-0.2360	0.0561	-4.2066	0.0000
EFFECT x LAF	0.1368	0.0908	1.5062	0.1328
CT x LAF	0.2538	0.0996	2.5487	0.0112
IC x LAF	0.2635	0.0919	2.8678	0.0044

Tests of highest order unconditional interactions show that although effectuation does not solely contribute to learning, the interaction of effectuation and both moderators of critical setback experiences and learning attitude toward failure significantly influence learning. In addition, the interaction of illusion of control and learning attitude toward failure (which was not under investigation in this dissertation) and the interaction of counterfactual thinking and learning attitude toward failure positively and significantly influence learning (Table 17). A summary of hypotheses 1 through 9 is provided in Table 19.

Table 17: Regression Results for Highest Order Unconditional Interactions

Predictor	R2-chng	F	df1	df2	P
Effectuation x Critical Setback Experiences	0.0324	17.6956	1.0000	387.0000	0.0000
Effectuation x Learning Attitude toward Failure	0.0042	2.2686	1.0000	387.0000	0.1328
BOTH (Effectuation)	0.0380	10.3532	2.0000	387.0000	0.0000
Counterfactual Thinking x Learning Attitude toward Failure	0.0119	6.4958	1.0000	387.0000	0.0112
Illusion of Control x Learning Attitude toward Failure	0.0151	8.2241	1.0000	387.0000	0.0044

Table 18: Regression Results for PROCESS Macro Model 29 - Considering CT Mediator as Outcome Variable

Predictor	B	SE	t	P
	Counterfactual Thinking			
Constant	7.7440	0.8657	8.9456	0.0000
Effectuation (EFFECT)	0.8550	0.1739	-4.9162	0.0000
Critical Setback Experiences (CSE)	0.0143	0.2791	0.0511	0.9593
EFFECT x CSE	0.0010	0.0560	0.0184	0.9854

Table 19: Summary of the Results of PROCESS Model 29

#	Hypothesis	Results	Coefficient values
1	Effectuation positively influences new venture learning.	Not Supported	.2228
2	Critical setback experience moderates the effect of effectuation on new venture learning such that the higher the critical setback experience, the *stronger* the positive relationship between effectuation and new venture learning.	Not Supported Significant relationship but opposite of what was expected	-.2360***
3	Learning attitude toward failure moderates the effect of effectuation on new venture learning such that the higher the learning attitude toward failure, the stronger the positive relationship between effectuation and new venture learning.	Not Supported	.1368
4	Effectuation negatively influences counterfactual thinking.	Supported	-.8550***
5	Critical setback experience negatively moderates the relationship between effectuation and counterfactual thinking in such a way that the higher the critical setback experience the weaker the negative relationship between effectuation and counterfactual thinking.	Not Supported	.0010
6	Counterfactual thinking *positively* influences new venture learning.	Not Supported Significant relationship but opposite of what was expected	-1.2324***
7	Learning attitude toward failure moderates the relationship between counterfactual thinking and new venture learning in such a way that the higher the learning attitude toward failure the stronger the positive relationship between counterfactual thinking and new venture learning.	Supported	.2538**
8	Effectuation is negatively related to illusion of control.	Not Supported	-.2844
9	Illusion of control is negatively related to new venture learning.	Supported	-1.2241***

* $p < 0.1$.
** $p < 0.05$.
*** $p < 0.01$.

Test 2: Analysis of the Relationship Between Effectuation and Likelihood of Exit Using PROCESS Model 16

In the second sub-model of the study shown in Figure 16, I have investigated the influence of effectuation on likelihood of exit by considering two mediators (Counterfactual Thinking and Illusion of Control) and two moderators (Fear of Failure and Escalation of Commitment). The results of this analysis show significant results for hypotheses 10, 12, 14, 17, and 18.

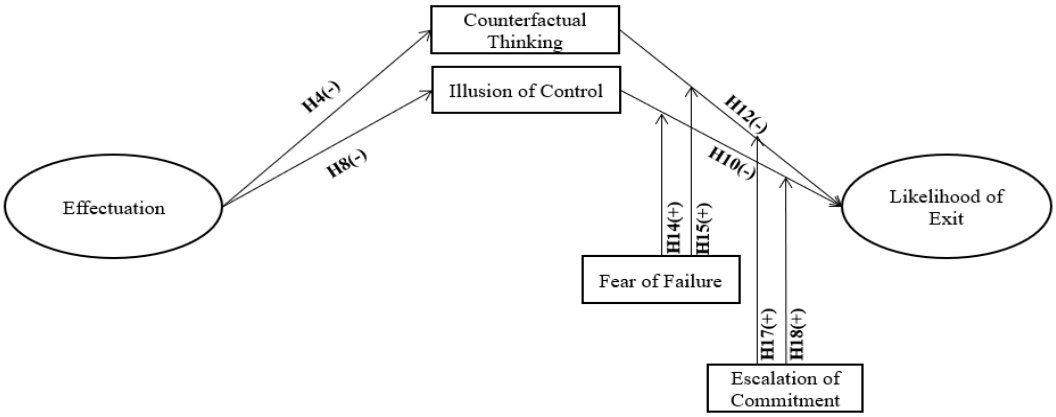

Figure 16: Sub-Model 2 Compatible with PROCESS Model 16

According to the ordinary least squares path analysis using PROCESS Macro Model 16, the results indicate that there is a negative relationship between illusion of control and likelihood of exit (Hypothesis 10). Opposite to the proposed hypothesis 12, the results show that higher levels of counterfactual thinking significantly increase the likelihood of exit (Hypothesis 12). In addition, I found support for the moderating role of fear of failure on the relationship between illusion of control and likelihood of exit (Hypothesis 14). In order to figure out how fear of failure as the moderator influences the relationship between illusion of control and likelihood of exit, I plotted the graph shown in Figure 17 by using PROCESS output data for visualizing moderation effect at 1 standard deviation above and below the mean. As shown in Figure 17, individuals with high illusion of control and low fear of failure are less likely to leave the business while individuals with same level of illusion of control, but those with high levels of fear of failure are more likely to leave their businesses. This implies that, when illusion of control is low, individuals with low fear of failure are more likely to leave their businesses than those who have high fear of failure.

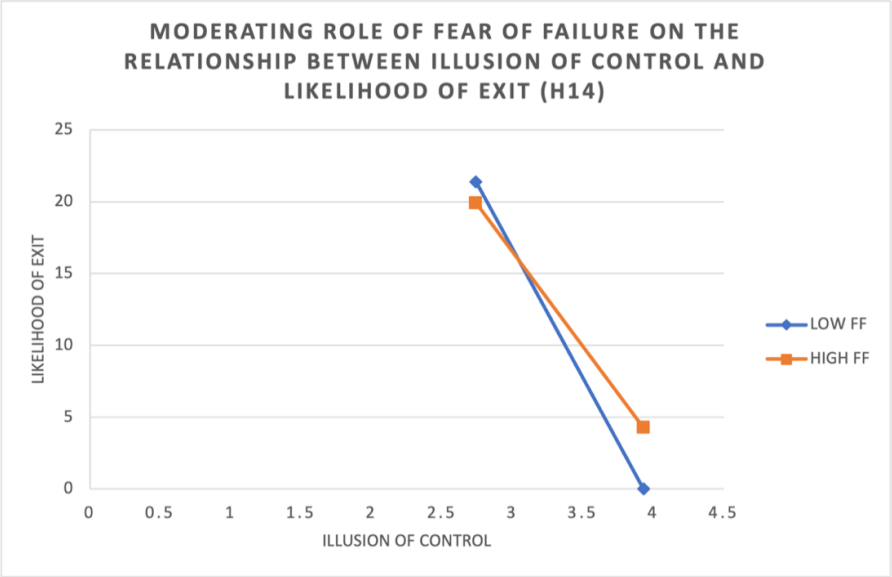

Figure 17: Moderating role of FF on the relationship between IC and Likelihood of Exit

In hypothesis 17, I proposed that escalation of commitment moderates the relationship between counterfactual thinking and likelihood of exit. The results of the analysis support this moderation impact. As shown in figure 18, when escalation of commitment is low, higher counterfactual thinking results in higher likelihood of exit. On the other hand, when escalation of commitment is high, the higher the counterfactual thinking, the lower the likelihood of exit. Relying on the plotted moderation effect shown in Figure 18, I conclude that escalation of commitment weakens the positive relationship between counterfactual thinking and likelihood of exit.

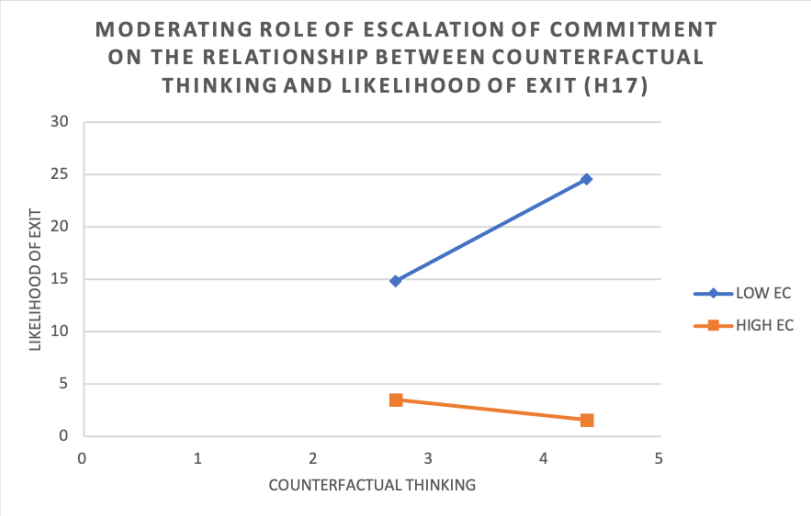

Figure 18: Moderating role of EC on the relationship between CT AND Likelihood of Exit

In Hypothesis 18, I proposed that escalation of commitment moderates the relationship between illusion of control and likelihood of exit. The analysis shows significant support for this hypothesis. Plotting the moderation effect in figure 19, I found out that individuals with high levels of escalation of commitment show a significantly lower tendency to exit than individuals with low escalation of commitment. This implies that the negative relationship between illusion of control and likelihood of exit is stronger when escalation of commitment is high.

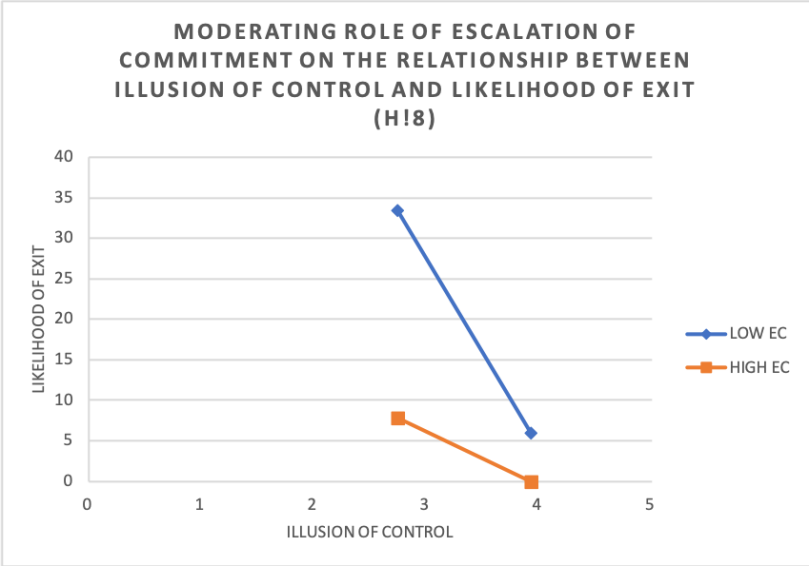

Figure 19: Moderating role of EC on the relationship between IC and Likelihood of Exit

Table 20: Regression Results for PROCESS Macro Model 16 - Likelihood of Exit as Outcome Variable

Predictor	B	SE	t	P
	Likelihood of Exit			
Constant	138.5763	17.3939	7.9669	0.0000
Effectuation (EFFECT)	-0.8931	1.3126	-0.6804	0.4967
Counterfactual Thinking (CT)	8.6256	2.4524	.3.5172	0.0005
Illusion of Control (IC)	-40.7193	3.6656	-11.1085	0.0000
Fear of Failure (FF)	-15.0644	6.5518	-2.2993	0.0220
Escalation of Commitment (EC)	-0.8001	0.2003	-3.9952	0.0001
CT x FF	0.9906	1.0934	0.9060	0.3655
IC x FF	3.8603	1.6210	2.3814	0.0177
CT x EC	-0.1453	0.0351	-4.1452	0.0000
IC x EC	0.2878	0.0455	6.3264	0.0000

The analysis of the indirect effects of effectuation on likelihood of exit indicates that there is significant and partial moderated mediation between effectuation and likelihood of exit through illusion of control. In other words, illusion of control mediates the relationship between effectuation and likelihood of exit and this relationship is significantly moderated by escalation of commitment. In fact, the results of my study indicate that effectuation does not impact likelihood of exit directly, but through illusion of control, effectuation reduces likelihood of exit and this negative relationship is stronger when escalation of commitment moderate this mediated relationship.

Table 21: Results of Conditional Indirect Effect of Effectuation on Likelihood of Exit via Counterfactual Thinking and Illusion of Control

Dependent Variable	Mediator	Levels of Fear of Failure (FF)	Levels of Escalation of Commitment (EC)	Effect	BootSE	BootLLCI	BootULCI
Likelihood of Exit	Counterfactual Thinking	Low (-1 SD)	Low (-1 SD)	-4.3775	1.5362	-7.6141	-1.5482
		Low (-1 SD)	Med	-1.3585	1.3734	-4.0805	1.3330
		Low (-1 SD)	High (+1 SD)	1.6604	1.7655	-1.7059	5.3037
		Med	Low (-1 SD)	-5.0073	1.5012	-8.1777	-2.2853
		Med	Med	-1.9883	1.0842	-4.2671	0.0293
		Med	High (+1 SD)	1.0306	1.3425	-1.4887	3.7678
		High (+1 SD)	Low (-1 SD)	-5.6370	1.7136	-9.2887	-2.5657
		High (+1 SD)	Med	-2.6181	1.1199	-4.9727	-0.6174
		High (+1 SD)	High (+1 SD)	0.4009	1.1299	-1.8507	2.6346
	Illusion of Control	Low (-1 SD)	Low (-1 SD)	6.2184	1.3868	3.5996	9.1248
		Low (-1 SD)	Med	4.5301	1.0467	2.5500	6.7398
		Low (-1 SD)	High (+1 SD)	2.8419	0.9189	1.0718	4.6898
		Med	Low (-1 SD)	5.5254	1.3012	3.1853	8.2893
		Med	Med	3.8372	0.8638	2.2046	5.6369
		Med	High (+1 SD)	2.1489	0.6124	1.0162	3.4276
		High (+1 SD)	Low (-1 SD)	4.8324	1.3220	2.6928	7.7470
		High (+1 SD)	Med	3.1442	0.8251	1.7509	4.9632
		High (+1 SD)	High (+1 SD)	1.4560	0.4360	0.6837	2.4069

Indices of Partial Moderated Mediation via CT

	Index	BootSE	BootLLCI	BootULCI
FF	-0.8434	0.8414	-2.5463	0.7802
EC	0.1237	0.0378	0.0533	0.2021

Indices of Partial Moderated Mediation via IC

	Index	BootSE	BootLLCI	BootULCI
FF	-0.9281	0.5049	-1.8819	0.1296
EC	-0.0692	0.0220	-0.1200	-0.0354

Table 22 provides a summary of the hypotheses tested regarding PROCESS Model 16.

Table 22: Summary of the Results of PROCESS Model 16

#	Hypothesis	Results	Coefficient values
10	Illusion of control is negatively related to likelihood of exit.	Supported	-40.7193***
12	Counterfactual thinking is negatively correlated with likelihood of exit.	Not Supported Significant relationship but opposite of what was expected	8.6256***
14	Fear of failure positively moderates the relationship between illusion of control and likelihood of exit in such a way that the higher the fear of failure the stronger the negative relationship between illusion of control and likelihood of exit.	Supported	3.8603**
15	Fear of failure positively moderates the relationship between counterfactual thinking and likelihood of exit in such a way that the higher the fear of failure the stronger the negative relationship between counterfactual thinking and likelihood of exit.	Not Supported	.9906
17	Escalation of commitment positively moderates the relationship between counterfactual thinking and likelihood of exit in such a way that the higher the escalation of commitment, the stronger the negative relationship between counterfactual thinking and likelihood of exit.	Supported	-.1453***
18	Escalation of commitment positively moderates the relationship between illusion of control and likelihood of exit in such a way that the higher the escalation of commitment, the stronger the negative relationship between illusion of control and likelihood of exit.	Supported	.2878***

* $p < 0.1$.
** $p < 0.05$.
*** $p < 0.01$.

Test 3: Analysis of the Relationship Between Critical Setback Experiences and Likelihood of Exit Using PROCESS Model 2

In the third sub-model of the study (See Figure 20), I investigated the relationship between critical setback experiences and likelihood of exit by including two moderators of Fear of Failure and Escalation of Commitment (Hypotheses 11, 13, and 16). The results of the ordinary least squares path analysis using PROCESS Macro Model 2 indicate that there is a positive and significant relationship between critical setback experiences and likelihood of exit. In Hypotheses 11, I was expecting to see a negative relationship between critical setback

experiences and likelihood of exit. Contrary to Hypothesis 11, the results indicate that when individuals face higher number of critical setbacks, they are more likely to give up and make an exit decision.

Contrary to the hypotheses 13 and 16, the results provide no support for the presence of moderated relationship between critical setback experiences and likelihood of exit.

Table 23: Regression Results for PROCESS Macro Model 2

Predictor	B	SE	t	P
	Likelihood of Exit			
Constant	8.9289	9.8737	0.9043	0.3664
Critical Setback Experiences (CSE)	11.3594	3.1771	3.5754	0.0004
Fear of Failure (FF)	8.0404	4.6428	1.7318	0.0841
Escalation of Commitment (EC)	-0.3232	0.1589	-2.0342	0.0426
CSE x FF	-2.0490	1.5291	-1.3401	0.1810
CSE x EC	-0.0877	0.0491	-1.7845	0.0751

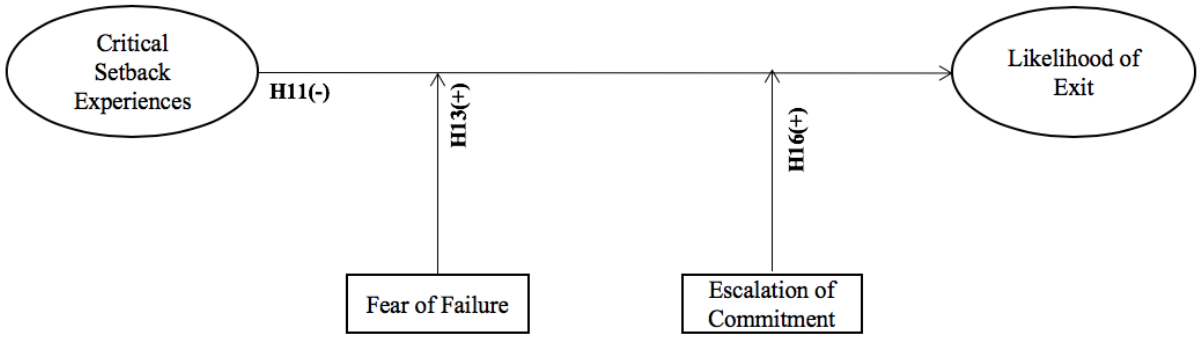

Figure 20: Sub-Model 3 Compatible with PROCESS Model 2

Table 24: Summary of the Results of PROCESS Model 2

#	Hypothesis	Results	Coefficient values
11	Critical setback experience is negatively correlated with likelihood of exit.	Not Supported Significant relationship but opposite of what was expected	11.3594***
13	Fear of failure positively moderates the relationship between critical setback experience and the likelihood of exit in such a way that the higher the fear of failure the stronger the negative relationship between critical setback experience and likelihood of exit.	Not Supported	-2.0490
16	Escalation of commitment positively moderates the relationship between critical setback experience and likelihood of exit in such a way that the higher the escalation of commitment, the stronger the negative relationship between critical setback experience and likelihood of exit.	Not Supported	-.0877

* p < 0.1.
** p < 0.05.
*** p < 0.01.

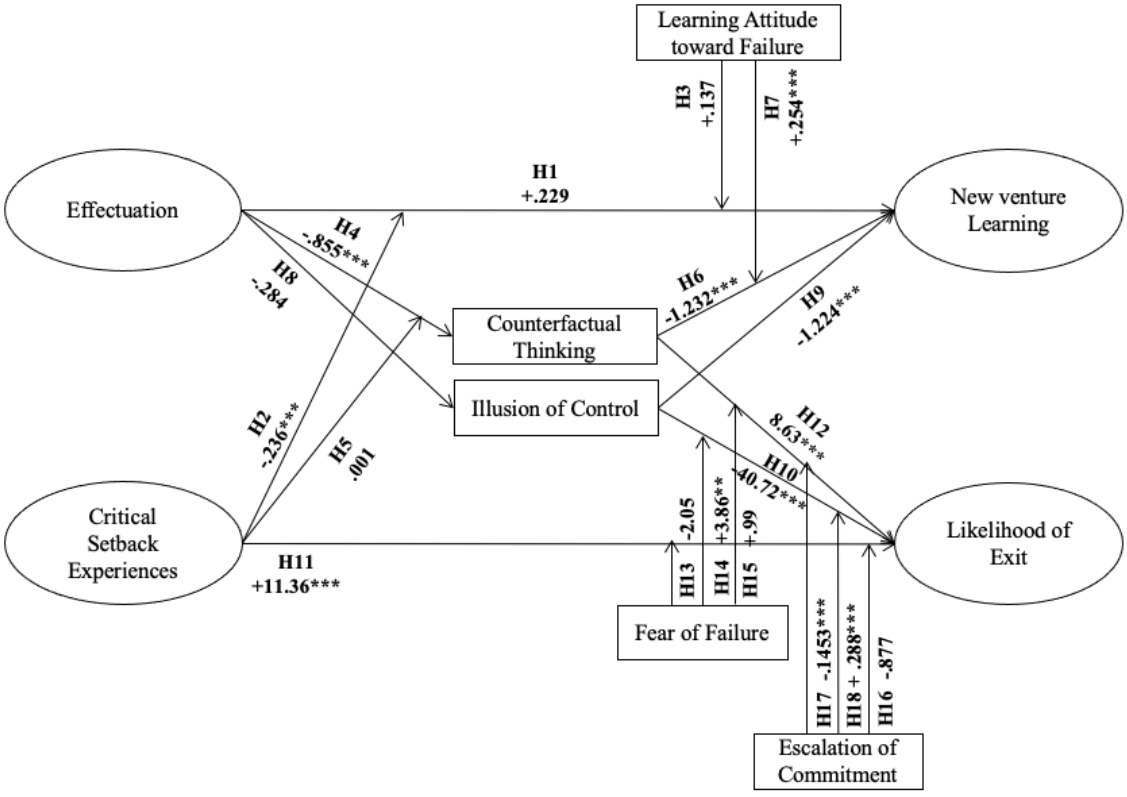

Figure 21: The final findings of the study

CHAPTER VI

DISCUSSION AND CONCLUSION

In this chapter, I provide discussion on the findings of the study, the theoretical and practical implications, and suggestions for future research.

Discussion

This study examined the influence of effectuation, as a thinking style of entrepreneurs, on new venture learning and likelihood of exit. I developed a moderated mediation model to investigate whether illusion of control and counterfactual thinking as two cognitive processes of entrepreneurs can mediate the relationship between effectuation and new venture learning and likelihood of exit. I included cognitive biases such as escalation of commitment and learning attitude toward failure as well as fear of failure and critical setback experiences as moderators to see how entrepreneurs respond to challenges their new ventures face.

The results showed that effectuation does not significantly influence learning, but when entrepreneurs face low critical setback experiences, effectuation is positively correlated with learning. When the number of critical setback experiences is high, the influence of effectuation on learning is negatively significant. It implies that low number of critical setback experiences prepares the effectual entrepreneur to learn, explore, and find possible alternatives. In fact, in such situation, entrepreneurs challenge themselves by new obstacles and try to expand their knowledge to overcome those obstacles. These setbacks provide a feedback loop for entrepreneurs and expand their learning abilities. Yet, when there is a high number of critical

setback experiences, entrepreneurs might feel overwhelmed and might not think of this situation as a learning opportunity.

Effectuation is also shown to be negatively associated with counterfactual thinking. In chapter III, I made the argument that, when unfavorable outcomes are achieved, effectual entrepreneurs naturally remain passionate to turn negative consequences into new opportunities and to set new goals (Wiltbank et al., 2006), instead of experiencing regret or a negative emotional state. Therefore, they are less involved in counterfactual thinking. Moreover, I expected to see a positive relationship between counterfactual thinking and learning, such that counterfactual thoughts increase learning. In contrast, the study's results showed that counterfactual thought are negatively correlated with new venture learning. This finding implies that feeling of regret and existence of counterfactual thoughts build a burden to learning. The entrepreneur might get too involved in thinking about what could have been done rather than what could be done.

Yet, when learning attitude toward failure is high and the entrepreneur believes every obstacle or poor outcome is a learning opportunity, counterfactual thinking positively associated with learning.

The findings also indicated that counterfactual thoughts and the feeling of regret enhances the likelihood of exit. Relying on prospect theory which explains choices which are framed as losses create greater risk-taking behavior than choices that are framed as gains (Alchian & Allen, 1977), I expected to see a negative relationship between counterfactual thinking and likelihood of exit. Prospect theory argues that when individuals find themselves in a potential loss situation, they insist on adopting behavior similar to what they have chosen in the past (Alchian & Allen, 1977). The finding of my study approved otherwise. It can be explained

that entrepreneurship by its nature is not accompanied with feeling of regret, As Roese and Summerville (2005) noted, entrepreneurs' biggest regrets are related to the largest opportunities that entrepreneurs have missed and they believed that they had the freedom of choice, but did not exploit the opportunity. So, the counterfactual thoughts could be accompanied with new opportunity exploitation and entrepreneurs may make an exit decision to go on a new entrepreneurial journey. In other words, the counterfactual thoughts may appear more often when entrepreneurs have lost hope in what they do.

The findings also support the hypothesis that illusion of control is negatively correlated with learning. In fact, Individuals with illusion of control bias tend to restrict their processing of information to their available cognitive schemas. They may unintentionally receive only the information that is compatible with their current schemas and may insist on pursuing the previously chosen strategies and may implement past behaviors in new circumstances (MacKillop et al., 2006; Steenbergh et al., 2002). When individuals are unable to change their problematic frames of reference (mindsets, habits of mind, meaning perspectives), their learning ability diminishes (Mezirow, 1991) and they are more likely to hold on to their businesses because they think they have control over the outcomes and are likely to keep an optimistic point of view instead of easily closing their businesses. As Alloy and Clements (1992) discussed, illusion of control releases the stress and negative thoughts of entrepreneurs and saves them from experiencing negative emotions and unpleasant feelings (Alloy & Clements, 1992). So, they are less likely to exit the business.

Although the results of the study showed that illusion of control is negatively associated with likelihood of exit, when entrepreneurs are dealing with fear of failure, the likelihood of exit goes higher. Hsu et al. (2017) refer to fear of failure as inhibitor of entrepreneurial action and

assert that entrepreneurs may withdraw from entrepreneurship and may decide not to pursue the business ideas that they may have once decided to pursue (Hsu et al., 2017). These arguments have been initially made by scholars about early stages of creating a new venture (Shinnar et al., 2012; Henderson and Robertson, 1999; Hatala, 2005; Bosma et al., 2007). However, in my research, the findings showed that fear of failure, even after the early stages of creating a new venture, can inhibit the entrepreneurs' courses of action and may improve the likelihood of exit.

As I discussed and the findings of my research showed, overemphasis on personal control reduces the likelihood of exit and individuals with cognitive bias of escalation of commitment are more triggered to save their ventures even if the outcomes or feedbacks are unpleasant. Escalation of commitment is a powerful cognitive bias which indicates the high tendency of an individual to persist with failing courses of action while making decisions (Brockner, 1992; Staw, 1981, 1997). When entrepreneurs deal with negative outcomes and counterfactual thoughts have overwhelmed the entrepreneur, the existence of escalation of commitment bias produces significant impact on entrepreneurs' decision making and they become too committed to their ventures.

Theoretical Implications

I believe the results of this dissertation contribute to the literature by corroborating and extending prior findings in several ways. First, in this dissertation, I used the effectuation/causation scale developed by Chandler et al. (2011) to test the theory of effectuation. To date, most of the empirical research on causation and effectuation has been experimental studies that analyze the think aloud verbal protocols of entrepreneurs (e.g., Dew et al., 2009; Sarasvathy et al., 1998), or field studies that have gathered and analyzed qualitative data (Sarasvathy and Kotha, 2001; Sarasvathy and Dew, 2005; Harting, 2004; Harmeling et al.,

2004; Dew et al., 2015). Although these studies provide highly valuable information on entrepreneurial decision making, there are many possible drawbacks that can be addressed with a quantitative research design. In my research, 397 entrepreneurs have been participated in the study while in most qualitative research, sample size can be a big issue as well as replication of the study. In addition, it is more likely to have misleading results in qualitative research.

Second, this dissertation helps to contribute to the development of effectuation research by empirically examining the consequences of effectuation in the important context of new venture learning. Consistent with emergent strategies, scholars argue that effectuation opens the door to new venture learning in terms of searching, recognizing, and understanding new entrepreneurial knowledge to quickly response to changing environments (March, 1978; Mintzberg, Ahlstrand, and Lampel, 1998; Politis, 2005; Wiltbank et al., 2006). Flexibility, as one of the dimensions of effectuation, helps the entrepreneurs to adjust their decisions and strategies and benefit from the changes in the environment by exploring new possible opportunities. In other words, entrepreneurs who think effectually are more prepared to deal with unknown and have higher learning capacity. The findings of my dissertation offer deeper insights into the missing link between effectuation and new venture learning by including cognitive challenges and biases that can influence learning. In fact, in this dissertation I examined how unfavorable cognitive biases such as illusion of control may influence learning of effectual entrepreneurs.

Third, this study takes a unique approach towards the concept of failure. Such unfavorable experiences do not occur overnight, and the education accompanying failure might not necessarily take place after failure experiences are complete. In this dissertation, I considered failure and learning as gradual processes and investigated how learning occurs or the exit decisions are made. For this reason, I included cognitive mechanisms that can improve or inhibit

learning and likelihood of exit such as learning attitude toward failure or illusion of control. As the results of my study indicate, learning attitude toward failure improve learning while illusion of control and fear of failure can inhibit learning.

Fourth, in this dissertation, three different aspects of failure are studied simultaneously. These are: learning attitude toward failure, fear of failure, and likelihood of exit considered as the likelihood of actual failure. This approach helps the scholars in the field to compare and contrast the influence that these failure-related phenomena create and explains how fear of failure can increase the possibility of actual failure; while learning attitude toward failure can diminish the possibility of failure or can postpone the actual failure.

Practical Implications

The current study investigated the gradual process of failure and learning and has several practical implications for entrepreneurs.

First, the findings raise awareness among entrepreneurs regarding their cognitive processes and provide interpretation on why they take specific entrepreneurial actions. Entrepreneurs can become aware of their psychological dispositions and biases and can attempt to train their minds in overcoming biases that could be harmful to the wellbeing of their new ventures. This study highlights the importance of balancing undesirable and dysfunctional cognitive biases. Entrepreneurs should take the necessary steps to take control over their cognitive biases such as illusion of control and escalation of commitment. Discussion of illusion of control and escalation of commitment can be well understood by giving the example of gambling. Gambling studies show that individuals have a tendency to invest more when they are in the state of loss, with the hope of regaining what they have already lost (Petry, 2003). According to my dissertation's results, entrepreneurs follow the same pattern, that is, escalation

of commitment significantly reduces their tendency to exit their business even if there are many critical setbacks. Acknowledging about this pattern, entrepreneurs should keep a realistic attitude toward what they can or cannot control. In addition, raising awareness regarding a bias such as escalation of commitment may help the entrepreneurs to prevent excessive investments in failing courses of action. Entrepreneurs may learn how to keep a positive attitude toward failure to boost their learning capabilities. The result of the study can help entrepreneurs to understand where effectual logic can help them and where they need to implement rational reasoning. For instance, if there are so many critical setbacks or negative feedback regarding their performance, they might need to implement rational reasoning and diminish their investment while by implementing effectual reasoning they start to rethink and restructure their actions and strategies. So, they might be able to benefit from both types of reasoning in critical situations.

Second, the findings of this study provide valuable information to entrepreneurs regarding the process of failure before it is actualized. In fact, by learning how failure gradually occurs, entrepreneurs can prevent failure or can reduce the amount of harm their ventures may receive in terms of both tangible and intangible assets. Fourth, Prior research insists that fear of failure is a barrier to entrepreneurship, however this study explains that fear of failure is actually part of the entrepreneurial journey. Fear of failure can influence entrepreneurial motivation positively or negatively. Although it can be a barrier to entrepreneurship, in many cases, fear is linked with the decision to approach high risk opportunities even more vigorously. Becoming aware of these consequences can help entrepreneurs adopt the most efficient coping approach to deal with their fear.

Limitations of the Study and Future Research

There are some limitations of the current research. First, in this study the data are cross-sectional. Thus, I cannot make statements about causality. My results are consistent with the causal processes outlined in the introduction and hypothesis development sections. But determining whether the processes discussed represent the actual causal paths will require additional research using a longitudinal design.

A second concern is that I assessed new venture learning using Zahra (2012)'s organizational learning scale and considered new venture learning as entrepreneur's learning. So, one could argue that different results might be obtained for other scales of new venture learning.

A third concern is the use of single-source data. Namely, questionnaire was completed by the entrepreneur, and this may carry the risk of CMV. I think there is a need to acquire data from different sources such as annual reports or business partners and co-founders if there are any. Alternatively, data can be obtained from the same entrepreneurs at different points in time. For instance, the researcher can design a two-phase study and ask the respondents to complete phase one of the study by answering to the questions related to effectuation, critical setback experiences, fear of failure, learning attitude toward failure, and new venture learning. Later, the researcher can ask the same respondents to complete phase two of the study by responding to the questions related to illusion of control, counterfactual thinking, escalation of commitment, and likelihood of exit.

Finally, because all of my hypotheses were directional and theory driven, I used one-tailed significance tests. The use of one-tailed tests increases the possibility of Type I errors and raises the possibility of threats to statistical conclusion validity. However, this is consistent with the guidelines provided by Kimmel (1957) and Jones (1952, 1954). Jones (1952) states, "a one-

sided alternative is the most powerful test for all directional hypotheses; therefore, it is strongly recommended that the one-tailed model be adopted wherever its use is appropriate" (p. 46). Furthermore, Jones (1954) concludes that if the purpose of a test is to determine whether a particular directional prediction is supported by the data, then "the one-tailed test is not only appropriate, but it is an error to use a two-tailed test model" (p. 586). Thus, despite the increased possibility of Type I error, I believe the use of one-tailed tests is appropriate for my research.

In terms of future research, the current findings opens so many opportunities for future research. First, the data was collected nationwide. It is possible that entrepreneurs from different cultures carry different cognitive biases and have various attitudes toward failure as a result of their cultures. Considering the impact of culture can provide valuable information regarding the investigated relationships in the field of entrepreneurship and cognition.

Second, findings can imply that there might be an inverted U-shape relationship between counterfactual thinking and new venture learning. Counterfactual thinking may increase learning to some points and then it might create a negative impact on learning. A U-shape relationship can also exist between critical setback experiences and likelihood of exit. When critical setback experiences increase, entrepreneurs may try to fix things and may insist on staying in the business. When the number of critical setback experiences increases considerably, feeling overwhelmed, entrepreneurs might decide to exit the business. These relationships can be studied in future research.

Third, scholars can empirically test if the co-existence of effectuation and causation, as recommended by Zhang et al. (2020), can create a different influence on either of these dependent variables: new venture learning and likelihood of exit. The logic of causation might be able to fulfil the possible flaws of effectuation and might increase learning or changes the

likelihood of exit under different circumstances. Coexistence of these two dimensions of entrepreneurial thinking can also create a different impact on cognitive biases such as illusion of control.

Conclusion

This current research was designed to answer the question of why some individuals insist on continuing their entrepreneurial journey while failure-related phenomena such as critical setbacks and counterfactual thoughts exist. The findings of the study interpreted underlying phenomena that influence different entrepreneurial decisions and indicated how effectuation influences new venture learning and likelihood of exit.

Unlike the prior research that have focused on the antecedents of failure and learning outcomes of failure, the current research took a different approach and studied failure and learning as entrepreneurial journeys rather than simply considering them as incidents or outcomes of new venture. Therefore, in this current research, instead of studying ventures that are rising from the ashes, I investigated the behavior of entrepreneurs before their ventures turn into ashes.

REFERENCES

Adler, A. (1956). *Striving for superiority. The individual psychology of Alfred Adler: A systematic presentation in selections from his writings*, 101-125.

Alchian, A., & Allen, W. A. (1977). *Exchange and production: Competition, coordination, and control* (2nd ed.). Belmont, CA: Wadsworth.

Aldrich, H.E. (1999). *Organizations evolving*. Thousand Oaks, CA: Sage Publications.

Allen, M. S., Greenlees, I., & Jones, M. V. (2014). Personality, counterfactual thinking, and negative emotional reactivity. *Psychology of Sport and Exercise*, *15*(2), 147-154.

Alloy, L. B., & Abramson, L. Y. (1979). Judgment of contingency in depressed and nondepressed students: Sadder but wiser?. *Journal of experimental psychology: General*, *108*(4), 441.

Alloy, L. B., & Clements, C. M. (1992). Illusion of control: Invulnerability to negative affect and depressive symptoms after laboratory and natural stressors. *Journal of Abnormal Psychology*, *101*(2), 234.

An, W., Rüling, C. C., Zheng, X., & Zhang, J. (2019). Configurations of effectuation, causation, and bricolage: implications for firm growth paths. *Small Business Economics*, 1-22.

Andrews, B. (1995). Bodily shame as a mediator between abusive experiences and depression. *Journal of Abnormal Psychology*, *104*(2), 277.

Andries, P., Debackere, K., & Looy, B. (2013). Simultaneous experimentation as a learning strategy: Business model development under uncertainty. *Strategic Entrepreneurship Journal*, *7*(4), 288-310.

Ansoff, H.I. (1988). *The New Corporate Strategy*. Wiley, New York.

Arenius, P., & Minniti, M. (2005). Perceptual variables and nascent entrepreneurship. *Small Business Economics*. *24*, 233–247.

Argyris, C., & Schon, D. A. (1996). *Organizational learning II: Theory, method, and practice*. Reading, MA: Addison Wesley.

Arkes, H. R., & Blumer, C. (1985). The psychology of sunk cost. *Organizational behavior and human decision processes*, *35*(1), 124-140.

Arora, P., Haynie, J. M., & Laurence, G. A. (2013). Counterfactual thinking and entrepreneurial self-efficacy: The moderating role of self-esteem and dispositional affect. *Entrepreneurship Theory and Practice*, *37*(2), 359-385.

Arthurs, J. D., Busenitz, L. W., Hoskisson, R. E., & Johnson, R. A. (2009). Signaling and initial public offerings: The use and impact of the lockup period. *Journal of Business Venturing*, *24*(4), 360-372.

Arum, R., & Müller, W. (2004). "The Reemergence of Self-Employment: Comparative Findings and Empirical Propositions". The Reemergence of Self-Employment. A Comparative Study of Self-Employment Dynamics and Social Inequality. *Princeton/Oxford*, 426-454.

Atkinson, J.W. (1957). Motivational determinants of risk-taking behavior. Psychological Review. *64*, 359–372.

Audretsch, D. B. (1994). Business survival and the decision to exit. Journal of the Economics of Business, *1*(1), 125-137.

Baker, T., Aldrich, H., Langton, N., & Cliff, J.E. (1997). Tempered by the flame: what do entrepreneurs learn from failure? *Paper presented at the Academy of Management*, Boston, MA.

Barnett, M. D., & Martinez, B. (2015). Optimists: It could have been worse; Pessimists: It could have been better: Dispositional optimism and pessimism and counterfactual thinking. *Personality and Individual Differences*, *86*, 122-125.

Baron, R. A. (1998). Cognitive mechanisms in entrepreneurship: Why and when entrepreneurs think differently than other people. *Journal of Business Venturing*, *13*(4), 275-294.

Baron, J. (2000). *Thinking and deciding*. Cambridge University Press.

Baron, R. A. (2002). OB and entrepreneurship: The reciprocal benefits of closer conceptual links. *Research in Organizational Behavior*, *24*, 225-269.

Baron, R. A. (2004). The cognitive perspective: a valuable tool for answering entrepreneurship's basic "why" questions. *Journal of Business Venturing*, *19*(2), 221-239.

Baron, R. A. (2008). The role of affect in the entrepreneurial process. *Academy of Management Review*, *33*(2), 328-340.

Baumard, P., & Starbuck, W.H. (2005). Learning from failures: why it may not happen. *Long Range Planning*, *38* (3), 281–298.

Beck, A. T., & Weishaar, M. (2005). Cognitive therapy. In *R. J. Corsini & D. Wedding (Eds.), Current psychotherapies*. Belmont, CA: Thomson Brooks.

Bell, D. E. (1982). Regret in decision making under uncertainty. *Operations Research*, *30(5)*, 961-981.

Bell, T. H. (1985). Deformation partitioning and porphyroblast rotation in meta-morphic rocks: a radical reinterpretation. *Journal of Metamorphic Geology*, *3*(2), 109-118.

Benassi, V. A., & Belli, R. F. (1989). Statistics and replication experiments: Comparing interaction effects. *Cognitive Therapy and Research*, *13*(3), 283-294.

Benassi, V. A., Sweeney, P. D., & Drevno, G. E. (1979). Mind over matter: perceived success at psychokinesis. *Journal of Personality and Social Psychology*, *37*(8), 1377.

Bercovitz, J., J. M. deFigueiredo, D. J. Teece. 1997. Firm capabilities and managerial decision making: A theory of innovation biases. In: *R. Garud, P. R. Nayyar, Z. B. Shapira, eds. Technological Innovation: Oversights and Foresights*. Cambridge University Press, New York, 233-259.

Biggadike, E. R. (1979). Corporate Diversification: Entry. *Strategy, and Performance*, 205.

Biner, S., Rafique, A. M., Ray, I., Cuk, O., Siegel, R. J., & Tolstrup, K. (2009). Aortopathy is prevalent in relatives of bicuspid aortic valve patients. *Journal of the American College of Cardiology*, 53(24), 2288-2295.

Birch, D. G. (1987). *Job creation in America: How our smallest companies put the most people to work*.

Bird, B.J. (1989). *Entrepreneurial behavior*. Reading, MA: Addison-Wesley.

Bird, M., & Wennberg, K. (2016). Why family matters: The impact of family resources on immigrant entrepreneurs' exit from entrepreneurship. *Journal of Business Venturing*, *31*(6), 687-704.

Birney, R. C., Burdick, H., & Teevan, R. C. (1969). *Fear of failure*. Van Nostrand-Reinhold Company.

Borys, B., & Jemison, D. B. (1989). Hybrid arrangements as strategic alliances: Theoretical issues in organizational combinations. *Academy of Management Review*, *14*(2), 234-249.

Bosma, N., Jones, K., Autio, E., Levie, J., (2007). *Global Entrepreneurship Monitor: 2007 Executive Report*. London Business School, London.

Bower, G. H. (1992). How might emotions affect learning? In *S. Christianson (Ed.), The handbook of emotion and memory: Research and theory*: 3-31. Hillsdale, NJ: Lawrence Erlbaum Associates

Bowman, E.H., & Singh, H. (1993). Corporate restructuring: reconfiguring the firm. *Strategic Management Journal, 14* (4), 5–14

Brettel, M., Mauer, R., Engelen, A., & Küpper, D. (2012). Corporate effectuation: Entrepreneurial action and its impact on R&D project performance. *Journal of Business Venturing, 27*(2), 167-184.

Brews, P.J., & Hunt, M.R., (1999), Learning to plan and planning to learn: resolving the planning school/learning school debate. *Strategic Management Journal, 20* (10), 889-913.

Briscoe, F., & Tsai, W. (2011). Overcoming relational inertia: How organizational members respond to acquisition events in a law firm. *Administrative Science Quarterly*, *56*, 408-440.

Brockner, J. (1992). The escalation of commitment to a failing course of action: Toward theoretical progress. *Academy of Management Review*, *17(*1), 39-61.

Brockner, J., Higgins, E. T., & Low, M. B. (2004). Regulatory focus theory and the entrepreneurial process. *Journal of Business Venturing*, *19*(2), 203-220.

Brockner, J., Houser, R., Birnbaum, G., Lloyd, K., Deitcher, J., Nathanson, S., & Rubin, J. Z. (1986). Escalation of commitment to an ineffective course of action: The effect of feedback having negative implications for self-identity. *Administrative Science Quarterly, 31*, 109126.

Brockner, J., Nathanson, S., Friend, A., Harbeck, J., Samuelson, C, Houser, R., Bazerman, M., & Rubin, J. Z. (1984). The role of modeling processes in the 'knee deep in the big muddy' phenomenon. *Organizational Behavior and Human Decision Processes, 33*, 77-99.

Brown, J. S., & Duguid, P. (2001). Knowledge and organization: A social-practice perspective. *Organization science, 12*(2), 198-213.

Bruno, A. V., McQuarrie, E. F., & Torgrimson, C. G. (1992). The evolution of new technology ventures over 20 years: Patterns of failure, merger, and survival. *Journal of Business Venturing, 7*(4), 291-302.

Burgelman, R. A., & Grove, A. S. (2007). Let chaos reign, then rein in chaos—repeatedly: Managing strategic dynamics for corporate longevity. *Strategic Management Journal, 28*(10), 965-979.

Burgers, J. M. 1975. Causality and anticipation. *Science, 189*,194-98.

Burger, J. M., & Cooper, H. M. (1979). The desirability of control. *Motivation and Emotion, 3*(4), 381-393.

Burger, J. M., & Schnerring, D. A. (1982). The effects of desire for control and extrinsic rewards on the illusion of control and gambling. *Motivation and Emotion, 6*(4), 329-335.

Busenitz, L. W. (1999). Entrepreneurial risk and strategic decision making: It's a matter of perspective. *The Journal of Applied Behavioral Science, 35*(3), 325-340.

Busenitz, L.W. & Barney, J.B. (1997). Differences between entrepreneurs and managers in large organizations: Biases and heuristics in strategic decision-making. *Journal of Business Venturing, 12*(1), 9-30.

Byrne, D. E. (1971). *The Attraction Paradigm*. New York: Academic Press.

Byrne, D., & Griffitt, W. (1973). Interpersonal attraction. *Annual Review of Psychology*, *24*(1), 317-336.

Cacciotti, G., Hayton, J.C. (2015). Fear and entrepreneurship: a review and research agenda. *International Journal of Management Review*, *17*, 165–190.

Cacciotti, G., Hayton, J. C., Mitchell, J. R., & Giazitzoglu, A. (2016). A reconceptualization of fear of failure in entrepreneurship. *Journal of Business Venturing, 31*(3), 302-325.

Cai, L., Guo, R., Fei, Y., & Liu, Z. (2017). Effectuation, exploratory learning and new venture performance: evidence from China. *Journal of Small Business Management, 55*(3), 388-403.

Camerer, C. F., D. Lovallo. (1999). Overconfidence and excess entry: An experimental approach. *American Economic Review*, *89*(1), 306-318.

Cannon, M. D., & Edmondson, A. C. (2001). Confronting failure: Antecedents and consequences of shared beliefs about failure in organizational work groups. *Journal of Organizational Behavior, 22*(2), 161-177.

Cannon, M. D., & Edmondson, A. C. (2005). Failing to learn and learning to fail (intelligently): How great organizations put failure to work to innovate and improve. *Long Range Planning, 38*(3), 299-319.

Caplan, B., (1999). The Austrian search for realistic foundations. *Southern Economics Journal, 65*(4), 823–838.

Cardon, M. S., Foo, M. D., Shepherd, D., & Wiklund, J. (2012). Exploring the heart: Entrepreneurial emotion is a hot topic. *Entrepreneurship Theory and Practice*, *36*(1), 1-10.

Cardon, M. S., & McGrath, R. G. (1999). When the going gets tough... Toward a psychology of entrepreneurial failure and re-motivation. *Frontiers of Entrepreneurship Research*, *29*(4), 58-72.

Cardon, M. S., Stevens, C. E., & Potter, D. R. (2011). Misfortunes or mistakes?: Cultural sensemaking of entrepreneurial failure. *Journal of Business Venturing*, *26*(1), 79-92.

Cardon, M. S., Zietsma, C., Saparito, P., Matherne, B. P., & Davis, C. (2005). A tale of passion: New insights into entrepreneurship from a parenthood metaphor. *Journal of Business Venturing, 20*(1), 23-45.

Carree, M., & Thurik, R. 2010. The impact of entrepreneurship on economic growth. In Z. J. Acs & D. B. Audretsch (Eds.), *Handbook of entrepreneurship research*, 557-594. New York: Springer.

Chandler, G. N., DeTienne, D. R., McKelvie, A., & Mumford, T. V. (2011). Causation and effectuation processes: A validation study. *Journal of Business venturing*, *26*(3), 375-390.

Chandler, G. N., DeTienne, D. R., & Mumford, T. V. (2007). Causation and effectuation: Measurement development and validation. *Frontiers of Entrepreneurship Research, 27*(13), 3.

Chrisman, J. J., Bauerschmidt, A., & Hofer, C. W. (1998). The determinants of new venture performance: An extended model. *Entrepreneurship Theory and Practice, 23*(1), 5-29.

Chiles, T.H., Bluedorn, A.C., & Gupta, V.K. (2007). Beyond creative destruction and entrepreneurial discovery: A radical Austrian approach to entrepreneurship. *Organization Studies, 28*, 467–493.

Chiles, T.H., Gupta, V.K., & Bluedorn, A.C. (2008). On Lachmannian and effectual entrepreneurship: A rejoinder to Sarasvathy and Dew (2008). *Organization Studies, 29*, 247–253.

Chirico, F. (2008). Knowledge accumulation in family firms: Evidence from four case studies. *International Small Business Journal*, *26*(4), 433-462.

Ciszewska-Mlinaric, M., Obloj, K., & Wasowska, A. (2016). Effectuation and causation: Two decision-making logics of INVs at the early stage of growth and internationalisation. *Journal of East European Management Studies*, 275-297.

Coltman, T., Devinney, T. M., Midgley, D. F., & Venaik, S. (2008). Formative versus reflective measurement models: Two applications of formative measurement. *Journal of Business Research, 61(*12), 1250-1262.

Conlon, D. E., & Garland, H. (1993). The role of project completion information in resource allocation decisions. *Academy of Management Journal, 36*(2), 402-413.

Coricelli, G., & Rustichini, A. (2010). Counterfactual thinking and emotions: regret and envy learning. Philosophical Transactions of the Royal society B: *Biological sciences, 365*(1538), 241-247.

Cowley, E., Briley, D. A., & Farrell, C. (2015). How do gamblers maintain an illusion of control?. *Journal of Business Research, 68*(10), 2181-2188.

Cooper, A. C., Gimeno-Gascon, F. J., & Woo, C. Y. (1994). Initial human and financial capital as predictors of new venture performance. *Journal of Business Venturing, 9*(5), 371-395.

Cooper, A., Woo, C., & Dunkelberg, W. (1988). Entrepreneurs perceived chances for success. *Journal of Business Venturing, 3*, 97–108.

Cooper, A., Woo, C., Dunkelberg, W. (1989). Entrepreneurship and the initial size of firms. *Journal of Business Venturing, 3*, 97–108.

Cope, J. (2005). Toward a dynamic learning perspective of entrepreneurship. *Entrepreneurship Theory and Practice*, *29*(4), 373-397.

Cope, J. (2011). Entrepreneurial learning from failure: An interpretative phenomenological analysis. *Journal of Business Venturing*, *26*(6), 604-623.

Crossan, M. M., Lane, H. W., & White, R. E. (1999). An organizational learning framework: From intuition to institution. *Academy of Management Review*, *24*(3), 522-537.

Crossan, M. M., Lane, H. W., White, R. E., & Djurfeldt, L. (1995). Organizational learning: Dimensions for a theory. *The International Journal of Organizational Analysis, 3*(4), 337-360.

Cyert, R. M., & March, J. G. (1963). *A behavioral theory of the firm*. Englewood Cliffs, NJ, 2, 169-187.

Davidsson, P., & Honig, B. (2003). The role of social and human capital among nascent entrepreneurs. *Journal of Business Venturing*, *18*(3), 301-331.

Decker, C., Mellewigt, T., 2007. Thirty years after Michael E. Porter: What do we know about business exit? *Academy of Management Perspectives, 21*(2), 41–55.

Deligianni, I., Voudouris, I., & Lioukas, S. (2017). Do effectuation processes shape the relationship between product diversification and performance in new ventures?. *Entrepreneurship Theory and Practice, 41*(3), 349-377.

Dess, G. G., Ireland, R. D., Zahra, S. A., Floyd, S. W., Janney, J. J., & Lane, P. J. (2003). Emerging issues in corporate entrepreneurship. *Journal of Management, 29*(3), 351-378.

DeTienne, D. R. (2010). Entrepreneurial exit as a critical component of the entrepreneurial process: Theoretical development. *Journal of Business Venturing, 25*(2), 203-215.

DeTienne, D. R., & Cardon, M. S. (2007). *Entrepreneurial exit strategies: The case for intention*. Working Paper.

DeTienne, D. R., Shepherd, D. A., & De Castro, J. O. (2008). The fallacy of "only the strong survive": The effects of extrinsic motivation on the persistence decisions for under-performing firms. *Journal of Business Venturing, 23*(5), 528-546.

Dew, N., Read, S., Sarasvathy, S.D., & Wiltbank, R. (2008). Outlines of a behavioral theory of the entrepreneurial firm. *Journal of Economic Behavior and Organization, 66*, 37–59.

Dew, N., Read, S., Sarasvathy, S.D., & Wiltbank, R. (2009). Effectual versus predictive logics in entrepreneurial decision-making: Differences between experts and novices. *Journal of Business Venturing, 24*, 287–309.

Dew, N., Read, S., Sarasvathy, S. D., & Wiltbank, R. (2015). Entrepreneurial expertise and the use of control. *Journal of Business Venturing Insights, 4*, 30-37.

Dew, N. & Sarasvathy, S.D. (2002). *What effectuation is not: Further development of an alternative to rational choice*. Paper presented at the Annual Meeting of the Academy of Management, Denver, CO.

Dew, N., Sarasvathy, S.D., Read, S., & Wiltbank, R. (2008). Immortal firms in mortal markets? An entrepreneurial perspective on the "innovator's dilemma." *European Journal of Innovation Management, 11*, 313–329.

Dew, N., Sarasvathy, S.D., Read, S., &Wiltbank, R. (2009). Affordable loss: Behavioral economic aspects of the plunge decision. *Strategic Entrepreneurship Journal, 3*, 105–126.

Dillman, D. A. (1978). *Mail and telephone surveys: The total design method* (Vol. 19). New York: Wiley.

Drucker, P.F. (1998). The discipline of innovation. *Harvard Business Review, 76*, 149–157.

Dyke, L. S., Fischer, E. M., & Reuber, A. R. (1992). An inter-industry examination of the impact of owner experience on firm performance. *Journal of Small Business Management, 30*(4), 72.

Easterby-Smith, M. (1997). Disciplines of organizational learning: contributions and critiques. *Human Relations, 50*(9), 1085-1113.

Eggers, J. P., & Song, L. (2015). Dealing with failure: Serial entrepreneurs and the costs of changing industries between ventures. *Academy of Management Journal, 58*(6), 1785-1803.

Eisenhardt, K.(1989). Making fast strategic decisions in high-velocity environments. *Academy of Management Journal, 32*, 543-576.

Ekore, J.O., Okekeocha, O.C., 2012. Fear of entrepreneurship among university graduates: a psychological analysis. *International Journal of Management. 29*, 515–524.

Elliot, A. J. (1997). Integrating the "classic" and "contemporary" approaches to achievement motivation: A hierarchical model of approach and avoidance achievement motivation. *Advances in Motivation and Achievement, 10*(7), 143-179.

Elliot, A.J., 1999. Approach and avoidance motivation and achievement goals. *Education Psychology. 34*(3), 169–189.

Elliot, A.J., 2006. The hierarchical model of approach-avoidance motivation. *Motivation and Emotion. 30*, 111–116.

Elliot, A.J., Church, M.A., 1997. A hierarchical model of approach and avoidance achievement motivation. *Journal of Personality and Social Psychology. 72*(1), 218–232.

Elliot, A.J., Thrash, T.M., 2004. The intergenerational transmission of fear of failure. *Personality and Social Psychology Bulletin. 30*(8), 957–971.

Epstude, K., & Roese, N. J. (2008). The functional theory of counterfactual thinking. *Personality and Social Psychology Review, 12*(2), 168-192.

Eyana, S. M., Masurel, E., & Paas, L. J. (2018). Causation and effectuation behaviour of Ethiopian entrepreneurs: Implications on performance of small tourism firms. *Journal of Small Business and Enterprise Development*.

Fiet, J.O., (2002). *The Systematic Search for Entrepreneurial Discoveries*. Quorum Books, Westport, CT.

Fiol, C. M., & Lyles, M. A. (1985). Organizational learning. *Academy of Management Review, 10*(4), 803-813.

Fisher, G. (2012). Effectuation, causation, and bricolage: A behavioral comparison of emerging theories in entrepreneurship research. *Entrepreneurship Theory and Practice, 36*(5), 1019-1051.

Foster, D. P., & Vohra, R. (1999). Regret in the on-line decision problem. *Games and Economic Behavior, 29*(1-2), 7-35.

Foster, D. P., & Young, H. P. (2003). Learning, hypothesis testing, and Nash equilibrium. *Games and Economic Behavior, 45*(1), 73-96.

Frigotto, M. L., & Della Valle, N. (2016). Gender and the Structuring of the Entrepreneurial Venture: An Effectuation Approach. *International Journal of Entrepreneurial Venturing*.

Futterer, F., Schmidt, J., & Heidenreich, S. (2018). Effectuation or causation as the key to corporate venture success? Investigating effects of entrepreneurial behaviors on business model innovation and venture performance. *Long Range Planning, 51*(1), 64-81.

Gaglio, C. M. (2004). The role of mental simulations and counterfactual thinking in the opportunity identification process. *Entrepreneurship Theory and Practice, 28*(6), 533-552.

Gaglio, C.M. & Katz, J.A. (2001). The psychological basis of opportunity identification: Entrepreneurial alertness. *Journal of Small Business Economics, 16*, 95–111.

Garland, H. (1990). Throwing good money after bad: The effect of sunk costs on the decision to escalate commitment to an ongoing project. *Journal of Applied Psychology, 75*(6), 728.

Garland, H., & Conlon, D. E. (1998). Too close to quit: The role of project completion in maintaining commitment. *Journal of Applied Social Psychology, 28*(22), 2025-2048.

Gartner, W. B. (1985). A conceptual framework for describing the phenomenon of new venture creation. *Academy of Management Review, 10*(4), 696-706.

Gartner, W. B. (1990). What are we talking about when we talk about entrepreneurship?. *Journal of Business venturing, 5*(1), 15-28.

Gigerenzer, G., & Gaissmaier, W. (2011). Heuristic decision making. *Annual Review of Psychology, 62*, 451-482.

Gilovich, T., & Medvec, V. H. (1994). The temporal pattern to the experience of regret. *Journal of Personality and social Psychology, 67*(3), 357.

Gimeno, J., Folta, T. B., Cooper, A. C., & Woo, C. Y. (1997). Survival of the fittest? Entrepreneurial human capital and the persistence of underperforming firms. *Administrative Science Quarterly*, 750-783.

Gjesme, T., & Nygard, R. (1970). Achievement-related motives: *Theoretical considerations and construction of a measuring instrument*. Unpublished report, University of Oslo.

Gjesme, T., Nygard, R., 1970. *Achievement-related Motives: Theoretical Considerations and Construction of a Measuring Instrument*. Unpublished manuscript, University of Oslo.

Glass, D. C., & Singer, J. E. (1972). *Urban stress: Experiments on noise and social stressors*.

Goel, S. & Karri, R. (2006). Entrepreneurs, effectual logic, and over-trust. *Entrepreneurship Theory and Practice, 30*, 477–493.

Gollwitzer, P. M., & Kinney, R. F. (1989). Effects of deliberative and implemental mind-sets on illusion of control. *Journal of Personality and Social Psychology, 56*(4), 531.

Gompers, P., Kovner, A., Lerner, J., & Scharfstein, D. (2010). Performance persistence in entrepreneurship. *Journal of Financial Economics, 96*(1), 18-32.

Goodman,N. (1947). The problem of counterfactual conditionals. *Journal of Philosophy, 44*, 113-128.

Green, S. G., Welsh, M. A., & Dehler, G. E. (2003). Advocacy, performance, and threshold influences on decisions to terminate new product development. *Academy of Management Journal, 46*(4), 419-434.

Grégoire, D. A., & Cherchem, N. (2020). A structured literature review and suggestions for future effectuation research. *Small Business Economics, 54*(3), 621-639.

Guo, R. (2019). Effectuation, opportunity shaping and innovation strategy in high-tech new ventures. *Management Decision*.

Guo, R., Cai, L., & Zhang, W. (2016). Effectuation and causation in new internet venture growth. *Internet research: Electronic networking applications and policy, 26*(2), 460-483.

Haley, U.C.V. & Stumpf, S.A. (1989). Cognitive trails in strategic decision-making: Linking theories of personalities and cognitions. *Journal of Management Studies, 26*(5), 477–497.

Hannan, M. T., & Freeman, J. (1977). The population ecology of organizations. *American Journal of Sociology, 82*(5), 929-964.

Harmeling, S.S., Oberman, S., Venkataraman, S., & Stevenson, H.H. (2004). That my neighbor's cow might live: Effectuation, entrepreneurship education, and regional development in Croatia. In A. Shaker, S.A. Zahra, C.G. Brush, P. Davidsson, J. Fiet, P.G. Greene, R.T. Harrison, M. Lerner, C. Mason, G.D. Meyer, J. Sohl, & A. Zacharakis (Eds.), *Frontiers of entrepreneurship research*, 24 (pp. 1–14).Wellesley, MA: Babson College.

Harting, T. (2004). *Entrepreneurial effectuation in a corporate setting: The case of Circuit City's Carmax unit*. Paper presented at the Babson Kauffman Entrepreneurship Research Conference, Glasgow, Scotland.

Hart, S., & Mas-Colell, A. (2000). A simple adaptive procedure leading to correlated equilibrium. *Econometrica, 68*(5), 1127-1150.

Harrison, R. T., & Leitch, C. M. (2005). Entrepreneurial learning: Researching the interface between learning and the entrepreneurial context. *Entrepreneurship Theory and Practice, 29*(4), 351-371.

Hastie, R. (1984). Causes and effects of causal attribution. *Journal of Personality and Social Psychology, 46*(1), 44.

Hatala, J.P. (2005). Identifying barriers to self-employment: the development and validation of the barriers to entrepreneurship success tool. *Performance Improvement Quarterly, 18*, 50–70.

Hatten, T.S. (1997). *Small Business: Entrepreneurship and Beyond*. Upper Saddle River, NJ: Prentice-Hall.

Hauser, A., Eggers, F., & Güldenberg, S. (2019). Strategic decision-making in SMEs: effectuation, causation, and the absence of strategy. *Small Business Economics*, 1-16.

Hayes, A. F. (2018). *Introduction to mediation, moderation, and conditional process analysis*, New York. Guilford Press.

Hayes, A. F., & Matthes, J. (2009). Computational procedures for probing interactions in OLS and logistic regression: SPSS and SAS implementations. *Behavior Research Methods, 41*(3), 924-936.

Headd, B. (2003). Redefining business success: Distinguishing between closure and failure. *Small Business Economics, 21*, 51-61.

Henderson, R., Robertson, M., (1999). Who wants to be an entrepreneur? Young attitudes to entrepreneurship as a career. *Education and Training. 41*, 236–245.

Hill, R. M., & Hlavacek, J. D. (1977). Learning from failure: Ten guidelines for venture management. *California Management Review, 19*(4), 5-16.

Hlady-Rispal, M., & Servantie, V. (2018). Deconstructing the way in which value is created in the context of social entrepreneurship. *International Journal of Management Reviews, 20*(1), 62-80.

Hmieleski, K. M., & Corbett, A. C. (2008). The contrasting interaction effects of improvisational behavior with entrepreneurial self-efficacy on new venture performance and entrepreneur work satisfaction. *Journal of Business Venturing, 23*(4), 482-496.

Hogarth, R. M. (1981). Beyond discrete biases: Functional and dysfunctional aspects of judgmental heuristics. *Psychological Bulletin, 90*(2), 197.

Hong, Y. Y., & Chiu, C. Y. (1988). Sex, locus of control, and illusion of control in Hong Kong as correlates of gambling involvement. *The Journal of Social Psychology, 128*(5), 667-673.

Honig, B., & Karlsson, T., (2004). Institutional forces and the written business plan. *Journal of Management, 30*(1), 29.

Hoy, F. (2008). Organizational learning at the marketing/entrepreneurship interface. *Journal of Small Business Management, 46*(1), 152-158.

Hsieh, K. Y., Tsai, W., & Chen, M. J. (2015). If they can do it, why not us? Competitors as reference points for justifying escalation of commitment. *Academy of Management Journal, 58*(1), 38-58.

Hsu, D. K., Wiklund, J., & Cotton, R. D. (2017). Success, Failure, and Entrepreneurial Reentry: An Experimental Assessment of the Veracity of Self-Efficacy and Prospect Theory. *Entrepreneurship Theory and Practice, 41*(1), 19-47.

Huber, G. P. (1991). Organizational learning: The contributing processes and the literatures. *Organization Science, 2*, 88–115.

Hubner, S., & Baum, M. (2018). Effectuation, entrepreneurs' leadership behaviour, and employee outcomes: a conceptual model. *International Journal of Entrepreneurial Venturing, 10*(4), 383-411.

Hurley, R. F., & Hult, G. T. M. (1998). Innovation, market orientation, and organizational learning: an integration and empirical examination. *The Journal of marketing*, 42-54.

Huy, Q. N. (1999). Emotional capability, emotional intelligence, and radical change. *Academy of Management Review, 24*(2), 325-345.

Jiang, Y., & Rüling, C. C. (2019). Opening the black box of effectuation processes: characteristics and dominant types. *Entrepreneurship Theory and Practice, 43*(1), 171-202.

Jiang, Y., & Tornikoski, E. T. (2019). Perceived uncertainty and behavioral logic: Temporality and unanticipated consequences in the new venture creation process. *Journal of Business Venturing, 34*(1), 23-40.

Jisr, R. E., & Maamari, B. E. (2017). Effectuation: exploring a third dimension to tacit knowledge. *Knowledge and Process Management, 24*(1), 72-78.

Jones, L. V. (1952). Test of hypotheses: one-sided vs. two-sided alternatives. *Psychological Bulletin, 49*(1), 43.

Jones, L. V. (1954). *A rejoinder on one-tailed tests*.

Jones, E. E., & Harris, V. A. (1967). The attribution of attitudes. *Journal of experimental social psychology, 3*(1), 1-24.

Kaish, S., & Gilad, B. (1991). Characteristics of opportunities search of entrepreneurs versus executives: Sources, interests, general alertness. *Journal of Business Venturing, 6*(1), 45-61.

Kahneman, D. & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica: Journal of the Econometric Society, 47*(2), 263–291.

Kahneman, D., & Tversky, A. (1982). The psychology of preferences. *Scientific American, 246*(1), 160-173.

Kahneman, D., Lovallo, D., (1994). Timid choices and bold forecasts: a cognitive perspective on risk taking. In: Rumelt, R.P., Schendel, D.E., Teece, D.J. (Eds.), Fundamental Issues in *Strategy: A Research Agenda*, pp. 71–96. OR Kahneman, D., D. Lovallo. 1993. *Timid choices and bold forecasts: A cognitive perspective on risk taking*. Management Sciences. 37(1) 17-31.

Kahneman, D., Slovic, P., & Tversky, A. (1982). *Judgment under uncertainty: Heuristics and biases*. New York: Cambridge University Press.

Kalinic, I., Sarasvathy, S. D., & Forza, C. (2014). 'Expect the unexpected': Implications of effectual logic on the internationalization process. *International Business Review, 23*(3), 635-647.

Karakaya, F. (2000). Market exit and barriers to exit: Theory and practice. *Psychology & Marketing, 17*(8), 651-668.

Karami, M., Wooliscroft, B., & McNeill, L. (2019). Effectuation and internationalisation: a review and agenda for future research. *Small Business Economics*, 1-35.

Karri, R. & Goel, S. (2008). Effectuation and over-trust: Response to Sarasvathy and Dew. *Entrepreneurship Theory and Practice, 32*, 739–748.

Kerlinger, F. N., Lee, H. B., & Bhanthumnavin, D. (2000). *Foundations of Behavioral Research: The Most Sustainable Popular Textbook*

Kerr, J., & Coviello, N. (2019). Weaving network theory into effectuation: A multi-level reconceptualization of effectual dynamics. *Journal of Business Venturing*.

Knott, A.M. & Posen, H.E. (2005). Is failure good? *Strategic Management Journal, 26*, 617–641.

Kasimatis, M., & Wells, G. L. (1995). Individual differences in counterfactual thinking. What might have been: The social psychology of counterfactual thinking, *Psychology Press*, 81-101.

Katz, J., & Gartner, W. B. (1988). Properties of emerging organizations. *Academy of Management Review, 13*(3), 429-441.

Kawakami, A. (2007). Success factors for those starting up their business for the second time: The effect of experience of failure on subsequent performance. Nihon-Roudou-Kenkyuu-Zasshi, *Journal of Japanese Labor Research*, *559*, 41-53.

Kazanjian, R. K., & Drazin, R. (1990). A stage-contingent model of design and growth for technology based new ventures. *Journal of Business Venturing, 5*(3), 137-150.

Keskin, D., Wevesr, R., & Brezet, H. (2020). Product innovation processes in sustainability-oriented ventures: A study of effectuation and causation. *Journal of Cleaner Production, 263*, 121210.

Kimmel, H. D. (1957). Three criteria for the use of one-tailed tests. *Psychological Bulletin, 54*(4), 351.

Kitching, J., & Rouse, J. (2020). Contesting effectuation theory: Why it does not explain new venture creation. *International Small Business Journal, 38*(6), 515-535.

Koellinger, P., M. Minniti and C. Schade, 2004, *I Think I Can, I Think I Can: A Cross-Country Study of Entrepreneurial Motivation*, Working paper, Humboldt University, DE.

Kollmann, T., Stöckmann, C., & Kensbock, J. M. (2017). Fear of failure as a mediator of the relationship between obstacles and nascent entrepreneurial activity—An experimental approach. *Journal of Business Venturing, 32*(3), 280-301.

Kollmann, T., Stöckmann, C., & Kensbock, J. M. (2017). Fear of failure as a mediator of the relationship between obstacles and nascent entrepreneurial activity—An experimental approach. *Journal of Business Venturing, 32*(3), 280-301.

Kumar, P. 2004. The effects of social comparison on inaction inertia. *Organizational Behavior and Human Decision Processes, 95*, 175–185.

Laine, I., & Galkina, T. (2017). The interplay of effectuation and causation in decision making: Russian SMEs under institutional uncertainty. *International Entrepreneurship and Management Journal, 13*(3), 905-941.

Laskovaia, A., Shirokova, G., & Morris, M. H. (2017). National culture, effectuation, and new venture performance: global evidence from student entrepreneurs. *Small Business Economics, 49*(3), 687-709.

Lang, J.W., Fries, S., 2006. A revised 10-item version of the achievement motives scale. *European Journal of Psychological Assessment, 22*(3), 216–224.

Langowitz, N., Minniti, M., 2007. The entrepreneurial propensity of women. *Entrepreneurship Theory and Practice, 31*, 341–364.

Langer, E. J. (1975). The illusion of control. *Journal of Personality and Social Psychology, 32*(2), 311.

Langer, E. J., & Roth, J. (1975). Heads I win, tails it's chance: The illusion of control as a function of the sequence of outcomes in a purely chance task. *Journal of Personality and Social Psychology, 32*(6), 951.

Lazarus, R. S. (1991). *Emotion and adaptation*. Oxford University Press on Demand.

Learned, K.E. (1999). What happened before the organization? A mode of organizational formation. *Entrepreneurship Theory and Practice, 17*(1), 39–48.

Lee, S.-H., Yamakawa, Y., Peng, M.W., & Barney, J.B. (2011). How do bankruptcy laws affect entrepreneurship development around the world? *Journal of Business Venturing, 26*(5), 505–520.

Leonard-Barton, D. (1995). *Wellsprings of knowledge: Building and sustaining the sources of innovation*.

Levitt, B., & March, J. G. (1988). Organizational learning. *Annual Review of Sociology, 14*(1), 319-338.

Lewis, M., Alessandri, S. M., & Sullivan, M. W. (1992). Differences in shame and pride as a function of children's gender and task difficulty. *Child Development, 63*(3), 630-638.

Li, Y., 2011. Emotions and new venture judgment in China. *Asia Pacific Journal of Management, 28*, 277–298.

Libby, R., & Rennekamp, K. (2012). Self-serving attribution bias, overconfidence, and the issuance of management forecasts. *Journal of Accounting Research, 50*(1), 197-231.

Loewenstein, G. F., Weber, E. U., Hsee, C. K., & Welch, N. (2001). Risk as feelings. *Psychological Bulletin, 127*(2), 267.

Long, D., Xia, Z. Y., & Hu, W. B. (2017). How does entrepreneurial opportunity affect the decision-making process of effectuation?. *Kybernetes*.

Loomes, G., & Sugden, R. (1982). Regret theory: An alternative theory of rational choice under uncertainty. *The Economic Journal, 92*(368), 805-824.

Loomes, G., & Sugden, R. (1986). Disappointment and dynamic consistency in choice under uncertainty. *The Review of Economic Studies, 53*(2), 271-282.

Louis, M. R., & Sutton, R. I. (1991). Switching cognitive gears: From habits of mind to active thinking. *Human Relations, 44*(1), 55-76.

Lowe, R.A. & Ziedonis, A.A. (2006). Overoptimism and the performance of entrepreneurial firms. *Management Science, 52*(2), 173–186.

Lunenburg, F. C. (2010). Escalation of commitment: Patterns of retrospective rationality. *International Journal of Management, Business and Administration, 13*(1), 1-5.

MacKillop, J., Anderson, E. J., Castelda, B. A., Mattson, R. E., & Donovick, P. J. (2006). Convergent validity of measures of cognitive distortions, impulsivity, and time perspective with pathological gambling. *Psychology of Addictive Behaviors, 20*(1), 75.

Mahoney, M. J. (1974). *Cognition and behavior modification*. Ballinger.

Maner, J. K., Richey, J. A., Cromer, K., Mallott, M., Lejuez, C. W., Joiner, T. E., & Schmidt, N. B. (2007). Dispositional anxiety and risk-avoidant decision-making. *Personality and Individual Differences, 42*(4), 665-675.

Manimala, M. J. (1992). Entrepreneurial heuristics: A comparison between high PL (pioneering-innovative) and low PI ventures. *Journal of Business Venturing, 7*(6), 477-504.

Mansoori, Y., & Lackeus, M. (2019). Comparing effectuation to discovery-driven planning, prescriptive entrepreneurship, business planning, lean startup, and design thinking. *Small Business Economics*, 1-28.

March, J. G. (1978). Bounded rationality, ambiguity, and the engineering of choice. RAND *Journal of Economics, 9*(2), 587–608.

March, J.G. (1999). *The Pursuit of Organizational Intelligence* (Blackwell, Oxford, UK).

Markman, G. D., Balkin, D. B., & Baron, R. A. (2002). Inventors and new venture formation: the effects of general self-efficacy and regretful thinking. *Entrepreneurship Theory and Practice, 27*(2), 149-165.

Markman, G. D., Baron, R. A., & Balkin, D. B. (2005). Are perseverance and self-efficacy costless? Assessing entrepreneurs' regretful thinking. *Journal of Organizational Behavior, 26*(1), 1-19.

Markman, K. D., Gavanski, I., Sherman, S. J., & McMullen, M. N. (1993). The mental simulation of better and worse possible worlds. *Journal of Experimental Social Psychology, 29*(1)*,* 87-109.

Markman, K. D., & Miller, A. K. (2006). Depression, control, and counterfactual thinking: functional for whom?. *Journal of Social and Clinical Psychology, 25*(2), 210-227.

Martinko, M. J., Douglas, S. C., & Harvey, P. (2006). Attribution theory in industrial and organizational psychology: A review. *International Review of Industrial and Organizational Psychology, 21*, 127

Matalamäki, M. J. (2017). Effectuation, an emerging theory of entrepreneurship–towards a mature stage of the development. *Journal of Small Business and Enterprise Development*.

Matalamäki, M., Vuorinen, T., Varamäki, E., & Sorama, K. (2017). Business growth in established companies; Roles of effectuation and causation. *Journal of Enterprising Culture, 25*(02), 123-148.

Mayer, K. B., & Goldstein, S. (1961). The first two years: Problems of small firm growth and survival. *Small Business Administration, 2.*

McCarthy, S., Schoorman, F., & Cooper, A. (1993). Reinvestment decisions by entrepreneurs: Rational decision-making or escalation of commitment? *Journal of Business Venturing, 8(*1), 9-24.

McClelland, D.C., Atkinson, J.W., Clark, R.A., Lowell, E.L. (1953). *The Achievement Motive.* Appleton-Century-Crofts, East Norwalk, CT.

McGrath, R. G. (1999). Falling forward: Real options reasoning and entrepreneurial failure. *Academy of Management Review*, *24*(1), 13-30.

McGrath, R. G. (2006). *Rumors of my mortality have been greatly exaggerated: reconsidering the mortality hypothesis*. Academy of Management, Atlanta, GA.

McGrath, R.G., Cardon, M.S. (1997). *Entrepreneurship and the functionality of failure*. Paper presented at the Seventh Annual Global Entrepreneurship Research Conference, Montreal, Canada.

McKelvie, A., Chandler, G. N., DeTienne, D. R., & Johansson, A. (2019). The measurement of effectuation: highlighting research tensions and opportunities for the future. *Small Business Economics*, 1-32.

McKenna, R. (1993). *Relationship marketing: Successful strategies for the age of the customer*. Basic Books.

McMullen, M. N., Markman, K. D., & Gavanski, I. (1995). Living in neither the best nor worst of all possible worlds: Antecedents and consequences of upward and downward counterfactual thinking. In N. J. Roese & J. M. Olson (Eds.), *What might have been: The social psychology of counterfactual thinking* (pp. 133–167). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.

Megiddo, N. (1980). On repeated games with incomplete information played by non-Bayesian players. *International Journal of Game Theory, 9*(3)*,* 157-167.

Mellers, B. A., Schwartz, A., Ho, K., & Ritov, I. (1997). Decision affect theory: Emotional reactions to the outcomes of risky options. *Psychological Science, 8*(6), 423-429.

Mellers, B., Schwartz, A., & Ritov, I. (1999). Emotion-based choice. *Journal of Experimental Psychology: General, 128*(3), 332.

Mezirow, J. (1991). *Transformative dimensions of adult learning*. Jossey-Bass, 350 Sansome Street, San Francisco, CA 94104-1310.

Miller, D. T., & McFarland, C. (1986). Counterfactual thinking and victim compensation: A test of norm theory. *Personality and Social Psychology Bulletin, 12*(4), 513-519.

Miller, D. T., & Ross, M. (1975). Self-serving biases in the attribution of causality: Fact or fiction?. *Psychological Bulletin, 82*(2), 213.

Minor, N., (2003). *Deciding to Sell Your Business: The Key to Wealth and Freedom*. Business Enterprise Press, Denver, CO.

Mintzberg, H., (1978), Patterns in strategy formation. *Management Science, 24*(9), 934–948.

Mintzberg, A., Ahlstrand, B., & Lampel (1999) *Strategy Safari*. Harlow: Prentice Hall.

Mintzberg, H., & Waters, J. A. (1985). Of strategies, deliberate and emergent. *Strategic Management Journal, 6*(3), 257-272.

Minniti, M., & Bygrave, W. (2001). A dynamic model of entrepreneurial learning. *Entrepreneurship Theory and practice, 25*(3), 5-5.

Minniti, M., Nardone, C., 2007. Being in someone else's shoes: the role of gender in entrepreneurship. *Small Business Economics, 28*, 223–238.

Bordbar, A., Abdolvand, N., Ghanbartehrani, N., Harandi, S. R., Nejad, S. S. V., Ebrahimpour, M., ... & Pira, D. (2020). 10. Developing a Business Model for Social Commerce in Tourism Industry in Iran. *Journal Archive, 12*.

Mitchell, J.R., Shepherd, D.A., 2010. To thine own self be true: images of self, images of opportunity, and entrepreneurial action. *Journal of Business Venturing, 25*, 138–154.

Mitchell, J.R., Shepherd, D.A., 2011. Afraid of opportunity: the effects of fear of failure on entrepreneurial decisions. *Frontiers of Entrepreneurship Research, 31*(1).

Mitchell, R.K., 1996. Oral history and expert scripts: demystifying the entrepreneurial experience. *Journal of Management History, 2*(3), 50–67.

Monty, R. A., & Permuter, L. C. (1975). Persistence of the effects of choice on paired-associate learning. *Memory & Cognition, 3*(2), 183-187.

Moon, H. (2001a). Looking forward and looking back: Integrating completion and sunk-cost effects within an escalation-of-commitment progress decision. *Journal of Applied Psychology, 86*(1), 104.

Moon, H. (2001b). The two faces of conscientiousness: duty and achievement striving in escalation of commitment dilemmas. *Journal of Applied Psychology, 86*(3), 533.

Moore, D.A. & Healy, P.J. (2008). The trouble with overconfidence. *Psychological Review*, *115*(2), 502–17.

Morgan, J., Sisak, D., 2016. Aspiring to succeed: a model of entrepreneurship and fear of failure. *Journal of Business Venturing. 31*, 1–21.

Morris, M.H., Kuratko, D.F., Schindehutte, M., Spivack, A.J., 2012. Framing the entrepreneurial experience. *Entrepreneurship Theory and Practice. 36*, 11–40.

Mueller, B. A., & Shepherd, D. A. (2016). Making the most of failure experiences: Exploring the relationship between business failure and the identification of business opportunities. *Entrepreneurship Theory and Practice, 40*(3), 457-487.

Nelson, R. R., & Winter, S. G. (1982). The Schumpeterian tradeoff revisited. *The American Economic Review, 72*(1), 114-132.

Newman, D. A. (2014). Missing data: Five practical guidelines. *Organizational Research Methods, 17*(4), 372-411.

Nicholls-Nixon, C. L., Cooper, A. C., & Woo, C. Y. (2000). Strategic experimentation: Understanding change and performance in new ventures. *Journal of Business Venturing, 15(*5-6), 493-521.

Nicholls-Nixon, C., Valliere, D., & Hassannezhad, Z. (2018, September). *A typology of university business incubators: Implications for research and practice*. In International Conference on Innovation and Entrepreneurship (pp. 535-XXII). Academic Conferences International Limited.

Nonaka, I., & Takeuchi, H. (1995). *The knowledge-creating company: How Japanese companies create the dynamics of innovation*. Oxford university press.

Ortega, A. M., García, M. T., & Santos, M. V. (2017). Effectuation-causation: what happens in new product development?. *Management Decision*.

Palich, L. E., & Bagby, D. R. (1995). Using cognitive theory to explain entrepreneurial risk-taking: Challenging conventional wisdom. *Journal of Business Venturing, 10*(6), 425-438.

Patzelt, H., Shepherd, D.A., 2011. Negative emotions of an entrepreneurial career: self-employment and regulatory coping behaviors. *Journal of Business Venturing*, *26*(2), 226–238.

Peng, M.W., Yamakawa, Y., & Lee, S.-H. (2010). Bankruptcy laws and entrepreneur-friendliness. *Entrepreneurship Theory and Practice, 34*, 517–530.

Pérez-Nordtvedt, L., Kedia, B. L., Datta, D. K., & Rasheed, A. A. (2008). Effectiveness and efficiency of cross-border knowledge transfer: An empirical examination. *Journal of Management Studies, 45*(4), 714-744.

Perlmuter, L. C., & Monty, R. A. (1977). The importance of perceived control: Fact or fantasy? Experiments with both humans and animals indicate that the mere illusion of control significantly improves performance in a variety of situations. *American Scientist, 65*(6), 759-765.

Perry, J. T., Chandler, G. N., & Markova, G. (2012). Entrepreneurial effectuation: a review and suggestions for future research. *Entrepreneurship Theory and Practice*, *36*(4), 837-861.

Petry, N. M. (2003). A comparison of treatment-seeking pathological gamblers based on preferred gambling activity. *Addiction*, *98*(5), 645-655.

Politis, D. (2005). The process of entrepreneurial learning: A conceptual framework. *Entrepreneurship Theory and Practice, 29*(4), 399-424.

Politis, D., Gabrielsson, J., 2009. Entrepreneurs' attitudes towards failure: an experiential learning approach. *International Journal of Entrepreneurial Behaviour and Research 5* (4), 364–383.

Prashantham, S., Kumar, K., Bhagavatula, S., & Sarasvathy, S. D. (2019). Effectuation, network-building and internationalisation speed. *International Small Business Journal, 37*(1), 3-21.

Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers*, *36*(4), 717-731.

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40*(3), 879-891.

Preacher, K. J., Rucker, D. D., & Hayes, A. F. (2007). Addressing moderated mediation hypotheses: Theory, methods, and prescriptions. *Multivariate behavioral research*, *42*(1), 185-227.

Presson, P. K., & Benassi, V. A. (1996). Illusion of control: A meta-analytic review. Journal of *Social Behavior and Personality, 11*(3), 493.

Prokopcáková, A., & Ruiselová, Z. (2008). Counterfactual thinking as related to anxiety and self-esteem. *Studia Psychologica, 50*(4), 429.

Rai, S. K. (2008). Indian entrepreneurs: an empirical investigation of entrepreneur's age and firm entry, type of ownership and risk behavior. *Journal of Services Research, 8*(1), 213.

Rao, R. D., & Argote, L. (2006). Organizational learning and forgetting: The effects of turnover and structure. *European Management Review, 3*(2), 77-85.

Ray, D.M., 1994. The role of risk-taking in Singapore. *Journal of Business Venturing*, *9*, 157-177.

Read, S., Dew, N., Sarasvathy, S.D., Song, M., & Wiltbank, R. (2009). Marketing under uncertainty: The logic of an effectual approach. *Journal of Marketing, 73*, 1-18.

Read, S. & Sarasvathy, S.D. (2005). Knowing what to do and doing what you know: Effectuation as a form of entrepreneurial expertise. *Journal of Private Equity, 9*, 45–62.

Read, S., Song, M., & Smit, W. (2009). A meta-analytic review of effectuation and venture performance. *Journal of Business Venturing, 24*(6), 573-587.

Resnick, L. B. (1987). *Education and learning to think*. National Academies.

Renzulli, L. A., Aldrich, H., & Moody, J. (2000). Family matters: Gender, networks, and entrepreneurial outcomes. *Social Forces, 79*(2), 523-546.

Reuber, A. R., Fischer, E., & Coviello, N. (2016). Deepening the dialogue: New directions for the evolution of effectuation theory. *Academy of Management Review, 41*(3), 536-540.

Reymen, I. M., Andries, P., Berends, H., Mauer, R., Stephan, U., & Burg, E. (2015). Understanding dynamics of strategic decision making in venture creation: a process study of effectuation and causation. *Strategic Entrepreneurship Journal, 9*(4), 351-379.

Reymen, I., Berends, H., Oudehand, R., & Stultiëns, R. (2017). Decision making for business model development: a process study of effectuation and causation in new technology-based ventures. *R&D Management, 47*(4), 595-606.

Roese, N. J. (1994). The functional basis of counterfactual thinking. *Journal of personality and Social Psychology, 66*(5), 805.

Roese, N. J. (1997). Counterfactual thinking. *Psychological Bulletin, 12*1(1), 133.

Roese, N. J., & Summerville, A. (2005). What we regret most... and why. Personality and Social *Psychology Bulletin, 31*(9), 1273-1285.

Rogoff, E. G., Lee, M. S., & Suh, D. C. (2004). "Who done it?" Attributions by entrepreneurs and experts of the factors that cause and impede small business success. *Journal of Small Business Management, 42*(4), 364-376.

Ronstadt, R. (1986). Exit, stage left why entrepreneurs end their entrepreneurial careers before retirement. *Journal of Business Venturing, 1*(3), 323-338.

Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs: General and Applied, 80*(1), 1.

Ruhnka, J. C., Feldman, H. D., & Dean, T. J. (1992). The "living dead" phenomenon in venture capital investments. *Journal of Business Venturing, 7*(2), 137-155.

Russo, J. E., & Schoemaker, P. J. (1992). Managing overconfidence. *Sloan Management Review, 33*(2), 7.

Sandberg, W. R., & Hofer, C. W. (1987). Improving new venture performance: The role of strategy, industry structure, and the entrepreneur. *Journal of Business venturing, 2*(1), 5-28.

Sanna, L. J., Carter, S. E., & Small, E. M. (2006). The Road Not Taken: Counterfactual Thinking Over Time. In L. J. Sanna & E. C. Chang (Eds.), *Judgments over time: The interplay of thoughts, feelings, and behaviors* (p. 163–181). Oxford University Press

Samuelson, W., & Zeckhauser, R. (1988). Status quo bias in decision making. *Journal of Risk and Uncertainty, 1*(1), 7-59.

Sarasvathy, S.D. (1998). *How do firms come to be? Towards a theory of the prefirm*. Doctoral dissertation, Carnegie Mellon University, Pittsburgh.

Sarasvathy, S. D. (2001a). Causation and effectuation: Toward a theoretical shift from economic inevitability to entrepreneurial contingency. *Academy of Management Review, 26*(2), 243-263.

Sarasvathy, S.D. (2001b). *Effectual reasoning in entrepreneurial decision making: Existence and bounds*. Best Paper Proceedings, Academy of Management 2001. Washington DC.

Sarasvathy, S. D. (2004). Making it happen: Beyond theories of the firm to theories of firm design. *Entrepreneurship Theory and practice, 28*(6), 519-531.

Sarasvathy, S.D. (2008). *Effectuation: Elements of entrepreneurial expertise*. Cheltenham, U.K.: Edward Elgar.

Sarasvathy, D. K., H. Simon, L. Lave. (1998). Perceiving and managing business risks: Differences between entrepreneurs and bankers. *Journal of Economic Behavior and Organization, 33*, 207-225.

Sarasvathy, S.D. & Dew, N. (2005). Entrepreneurial logics for a technology of foolishness. *Scandinavian Journal of Management, 21*, 385–406.

Sarasvathy, S.D. & Dew, N. (2008a). Effectuation and over-trust: Debating Goel and Karri. *Entrepreneurship Theory and Practice, 32*, 727–738.

Sarasvathy, S.D. & Dew, N. (2008b). Is effectuation Lachmannian? A response to Chiles, Bluedorn, and Gupta. *Organization Studies, 29*, 239–245.

Sarasvathy, S.D., Dew, N., Read, S., & Wiltbank, R. (2008). Designing organizations that design environments: Lessons from entrepreneurial expertise. *Organization Studies, 29*, 331–350.

Sarasvathy, S.D., Dew, N., Velamuri, R.S., & Venkataraman, S. (2003). Three views of entrepreneurial opportunity. In Z. Acs & D. Audretsch (Eds.), *Handbook of entrepreneurial research* (pp. 141–160). Dordrecht: Kluwer.

Sarasvathy, S.D. & Kotha, S. (2001). Dealing with Knightian uncertainty in the new economy: The Real-Networks case. In J. Butler (Ed.), *Research on management and entrepreneurship* (pp. 31–62). Greenwich, CT: IAP, Inc.

Sarasvathy, S. D., Menon, A. R., & Kuechle, G. (2013). Failing firms and successful entrepreneurs: Serial entrepreneurship as a temporal portfolio. *Small Business Economics, 40*(2), 417-434.

Schaefer, P., Williams, C., Goodie, A., & Campbell, K. (2004). Overconfidence and the big five. *Journal of Research in Personality, 38*, 473–480.

Schindehutte, M., Morris, M., & Allen, J. (2006). Beyond achievement: Entrepreneurship as extreme experience. *Small Business Economics, 27*(4-5), 349-368.

Schmidt, S., Bendig, D., & Brettel, M. (2018). Building an equity story: the impact of effectuation on business angel investments. *Journal of Business Economics, 88*(3), 471-501.

Schmidt, J. B., & Calantone, R. J. (2002). Escalation of commitment during new product development. *Journal of the Academy of Marketing Science, 30*(2), 103-118.

Schwenk, C. R. (1988). The cognitive perspective on strategic decision making. *Journal of Management Studies, 25*(1), 41-55.

Scott, M., & Lewis, J. (1984). Re-thinking entrepreneurial failure. *Success and Failure in Small Business*, 29-56.

Senge, P. (1990). *The fifth discipline: The art and science of the learning organization*. New York: Currency Doubleday.

Servantie, V., & Rispal, M. H. (2018). Bricolage, effectuation, and causation shifts over time in the context of social entrepreneurship. *Entrepreneurship & Regional Development, 30*(3-4), 310-335.

Shane, S., Locke, E. A., & Collins, C. J. (2003). Entrepreneurial motivation. *Human resource management review*, *13*(2), 257-279.

Shane, S., & Venkataraman, S. (2001). Entrepreneurship as a field of research: A response to Zahra and Dess, Singh, and Erikson. *Academy of Management Review, 26*(1), 13-16.

Shao, C. (2012). *Effectuation versus causation in entrepreneurial decision-making in chinese context: consideration of impact of family business background and gender* (Master's thesis, University of Twente).

Shapero, A. (1982). Social dimensions of entrepreneurship. In:Kent, C.A., Sextonn, D.L., and Vesper, K.H. (Eds.), *The Encyclopedia of Entrepreneurship*: 3-9. Englewood Cliffs, NJ: Prentice-Hall.

Sharot, T. (2011). The optimism bias. *Current Biology, 21*(23), 941–945.

Shaver, K. G., Gartner, W. B., Crosby, E., Bakalarova, K., & Gatewood, E. J. (2001). Attributions about entrepreneurship: A framework and process for analyzing reasons for starting a business. *Entrepreneurship Theory and Practice, 26*(2), 5-28.

Shinnar, R.S., Giacomin, O., Janssen, F., 2012. Entrepreneurial perceptions and intentions: the role of gender and culture. *Entrepreneurship Theory and Practice, 36*(3), 465–493.

Shepherd, D.A. (2003). Learning from business failure: Propositions of grief recovery for the self-employed. *Academy of Management Review, 28*(2), 318–328.

Shepherd, D. A., Douglas, E. J., & Shanley, M. (2000). New venture survival: Ignorance, external shocks, and risk reduction strategies. *Journal of Business Venturing, 15*(5-6), 393-410.

Shepherd, D. A., & Haynie, J. M. (2011). Venture failure, stigma, and impression management: A self-verification, self-determination view. *Strategic Entrepreneurship Journal, 5*(2), 178-197.

Sherman, S. J., & McConnell, A. R. (1995). Dysfunctional implications of counterfactual thinking: When alternatives to reality fail us. What might have been: *The Social Psychology of Counterfactual Thinking*, 199-231.

Singer, J. (1968). *Consistency as a stimulus process mechanism. Theories of cognitive consistency: A sourcebook*. Chicago: Rand McNally.

Singh, S., Corner, P., Pavolvich, K., 2007. Coping with entrepreneurial failure. *Journal of Management and Organization 13*(4), 331–344.

Singh, J. V., Tucker, D. J., & House, R. J. (1986). Organizational legitimacy and the liability of newness. *Administrative Science Quarterly*, 171-193.

Simon, M., Houghton, S. M., & Aquino, K. (2000). Cognitive biases, risk perception, and venture formation: How individuals decide to start companies. *Journal of Business Venturing, 15*(2), 113-134.

Sitkin, S. B. (1992). Learning through failure: the strategy of small losses. *Research in Organizational Behavior, 14*, 231-266.

Slater, S. F., & Narver, J. C. (1995). Market orientation and the learning organization. *Journal of Marketing, 59*(3), 63-74.

Sleesman, D. J., Conlon, D. E., McNamara, G., & Miles, J. E. (2012). Cleaning up the big muddy: A meta-analytic review of the determinants of escalation of commitment. *Academy of Management Journal, 55*(3), 541-562.

Smolka, K. M., Verheul, I., Burmeister–Lamp, K., & Heugens, P. P. (2018). Get it together! Synergistic effects of causal and effectual decision–making logics on venture performance. *Entrepreneurship Theory and Practice, 42*(4), 571-604.

Stanovich, K.E. & West, R.F. (2008). On the failure of cognitive ability to predict myside and one-sided thinking biases. Thinking and Reasoning, 14(2), 129–167.

Starr, J. A., & Bygrave, W. D. (1991). The assets and liabilities of prior start-up experience: An exploratory study of multiple venture entrepreneurs. In N. C. Churchill et al. (Eds.), *Frontiers of entrepreneurship research*: 213-227. Babson Park, MA: Babson Coll

Staw, B. M. 1976. Knee-deep in the big muddy: A study of escalating commitment to a chosen course of action. *Organizational Behavior and Human Performance, 16*: 27–44.

Staw, B. M. (1981). The escalation of commitment to a course of action. *Academy of Management Review, 6*(4), 577-587.

Staw, B. M. (1997). The escalation of commitment: An update and appraisal. *Organizational Decision Making*, 191, 215.

Staw, B.M., Barsade, S.G., (1993). Affect and managerial performance: a test of the sadder-but-wider versus happier-and-smarter hypotheses. *Administrative Science Quarterly, 38*, 304–331.

Steele, C. M. (1988). The psychology of self-affirmation: Sustaining the integrity of the self. In Advances in experimental social psychology. *Academic Press, 21*, 261-302.

Steenbergh, T. A., Meyers, A. W., May, R. K., & Whelan, J. P. (2002). Development and validation of the Gamblers' Beliefs Questionnaire. *Psychology of Addictive Behaviors, 16(*2), 143.

Sternberg, R. J. (Ed.). (1999). *The nature of cognition*. Mit Press.

Sternberg, R. J. (2004). Successful intelligence as a basis for entrepreneurship. *Journal of Business Venturing, 19*(2), 189-201.

Stevenson, H.H. & Gumpert, D.E. (1985). The heart of entrepreneurship. *Harvard Business Review, 63*, 85–94

Stigler, G.J., (1952). *The Theory of Price*. Macmillan, New York, NY.

Stinchcombe, A. L. (1965). Organizations and social structure. *Handbook of Organizations, 44*(2), 142-193.

Stokes, D., Blackburn, R., 2002. Learning the hard way: the lessons of owner–managers who have closed their businesses. *Journal of Small Business and Enterprise Development 9*(1), 17–27.

Strauß, P., Greven, A., & Fischer, D. (2019). Effectuation: An International Strategy to Prevent Entrepreneurial Emotional Exhaustion?. *Academy of Management Proceedings, 1*, 12851. Briarcliff Manor, NY 10510: Academy of Management.

Strauß, P., Greven, A., & Brettel, M. (2020). Determining the influence of national culture: insights into entrepreneurs' collective identity and effectuation. *International Entrepreneurship and Management Journal*, 1-26.

Stroe, S., Parida, V., & Wincent, J. (2018). Effectuation or causation: An fsQCA analysis of entrepreneurial passion, risk perception, and self-efficacy. *Journal of Business Research, 89*, 265-272.

Szambelan, S., Jiang, Y., & Mauer, R. (2020). Breaking through innovation barriers: Linking effectuation orientation to innovation performance. *European Management Journal, 38*(3), 425-434.

Taylor, M. P. (1999). Survival of the fittest? An analysis of self-employment duration in Britain. *The Economic Journal, 109*(454), 140-155.

Taylor, S. E. (1989). *Positive illusions: Creative self-deception and the healthy mind*. Basic Books/Hachette Book Group.

Taylor, S. E., & Armor, D. A. (1996). Positive illusions and coping with adversity. *Journal of Personality, 64*(4), 873-898.

Taylor, S. E., & Brown, J. D. (1988). Illusion and well-being: a social psychological perspective on mental health. *Psychological Bulletin, 103*(2), 193.

Thornhill, S., Amit, R., 2003. Learning about failure: bankruptcy, firm age, and the resource-based view. *Organization Science, 14*(5), 497–509.

Thompson, S. C., Armstrong, W., & Thomas, C. (1998). Illusions of control, underestimations, and accuracy: a control heuristic explanation. *Psychological Bulletin, 123*(2), 143.

Turner, J. C., Hogg, M. A., Oakes, P. J., Reicher, S. D., & Wetherell, M. S. (1987). *Rediscovering the social group: A self-categorization theory*. Basil Blackwell.

Tversky, A. & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science, 185*(4157), 1124–1131.

Ucbasaran, D., Shepherd, D. A., Lockett, A., & Lyon, S. J. (2013). Life after business failure: The process and consequences of business failure for entrepreneurs. *Journal of Management, 39*(1), 163-202.

Ucbasaran, D., Westhead, P., Wright, M., & Flores, M. (2010). The nature of entrepreneurial experience, business failure and comparative optimism. *Journal of Business Venturing, 25*(6), 541-555.

Valliere, D. (2015). An effectuation measure of entrepreneurial intent. *Procedia-Social and Behavioral Sciences*, *169*, 131-142.

Van Praag, C. M. (2003). Business survival and success of young small business owners. *Small Business Economics, 21*(1), 1-17.

Venkataraman, S., & Sarasvathy, S. D. (2001). *Strategy and entrepreneurship: Outlines of an untold story*. Handbook of strategic management, 650-668.

Vera, D., & Crossan, M. (2004). Strategic leadership and organizational learning. *Academy of Management Review, 29*(2), 222-240.

Vesper, K. H. (1980). New venture planning. *Journal of Business Strategy*.

Viale, R., (1992). Cognitive constraints of economic rationality. In: Simon, H. (Ed.), *Economics, Bounded Rationality and the Cognitive Revolution*. Edward Elgar Publishing Limited, Brookfield, VT, pp. 174–193.

Villani, E., Linder, C., & Grimaldi, R. (2018). Effectuation and causation in science-based new venture creation: A configurational approach. *Journal of Business Research, 83*, 173-185.

Wach, K. (2014). International Entrepreneurship and the Third Age: The Effect of the Entrepreneur's Age on Internationalisation of Polish Businesses. *Przedsiębiorczość i Zarządzanie, 15*(11), 65-80.

Wadeson, N. (2006). Cognitive aspects of entrepreneurship: Decision-making and attributes to risk. In M. Casson, B. Yeung, A. Basu, & N. Wadeson (Eds.), *The Oxford handbook of entrepreneurship* (pp. 91– 113). New York: Oxford University Press.

Wagner, J., 2007. What difference a Y makes — female and male nascent entrepreneurs in Germany. *Small Business Economics, 28*, 1–21.

Watson, J., & Everett, J. (1993). Defining small business failure. *International Small Business Journal, 11*(3), 35-48.

Watson, J., & Everett, J. E. (1996). Do small businesses have high failure rates?. *Journal of Small Business Management, 34*(4), 45.

Weick, K. E. (1979). Cognitive processes in organizations. *Research in Organizational Behavior, 1*(1), 41-74.

Welpe, I. M., Spörrle, M., Grichnik, D., Michl, T., & Audretsch, D. B. (2012). Emotions and opportunities: The interplay of opportunity evaluation, fear, joy, and anger as antecedent of entrepreneurial exploitation. *Entrepreneurship Theory and Practice, 36*(1), 69-96.

Welter, C., & Kim, S. (2018). Effectuation under risk and uncertainty: A simulation model. *Journal of Business Venturing, 33*(1), 100-116.

Welter, C., Mauer, R., & Wuebker, R. J. (2016). Bridging behavioral models and theoretical concepts: effectuation and bricolage in the opportunity creation framework. *Strategic Entrepreneurship Journal, 10*(1), 5-20.

Wennberg, K., Wiklund, J., DeTienne, D.R., & Cardon, M.S. (2010). Reconceptualizing entrepreneurial exit: Divergent exit routes and their drivers. *Journal of Business Venturing, 25*(4), 361–375.

Werhahn, D., Mauer, R., Flatten, T. C., & Brettel, M. (2015). Validating effectual orientation as strategic direction in the corporate context. *European Management Journal, 33*(5), 305-313.

White, R. W. (1959). Motivation reconsidered: The concept of competence. *Psychological Review, 66*(5), 297.

Whyte, G. 1986. Escalating commitment to a cause of action: A reinterpretation. *Academy of Management Review, 11*, 311–321.

Wiklund, J., Baker, T., & Shepherd, D. 2010. The age effect of financial indicators as buffers against the liabilities of newness. *Journal of Business Venturing, 25*, 423-437.

Wiltbank, R., Dew, N., Read, S., & Sarasvathy, S.D. (2006). What to do next? The case for non-predictive strategy. *Strategic Management Journal, 27*, 981–998.

Wiltbank, R., Read, S., Dew, N., & Sarasvathy, S.D. (2009). Prediction and control under uncertainly: Outcomes in angel investing. *Journal of Business Venturing, 24*, 116–133.

Wohl, M. J., & Enzle, M. E. (2002). The deployment of personal luck: Sympathetic magic and illusory control in games of pure chance. *Personality and Social Psychology Bulletin, 28*(10), 1388-1397.

Wohl, M. J., & Enzle, M. E. (2003). The effects of near wins and near losses on self-perceived personal luck and subsequent gambling behavior. *Journal of Experimental Social Psychology, 39*(2), 184-191.

Wohl, M. J., & Enzle, M. E. (2009). Illusion of control by proxy: Placing one's fate in the hands of another. *British Journal of Social Psychology, 48*(1), 183-200.

Wood, M.S., McKelvie, A., Haynie, J.M., 2014. Making it personal: opportunity individuation and the shaping of opportunity beliefs. *Journal of Business Venturing*, *29*, 252–272.

Wu, L., Liu, H., & Su, K. (2020). Exploring the dual effect of effectuation on new product development speed and quality. *Journal of Business Research, 106*, 82-93.

Xu, Y., & Koivumäki, T. (2019). Digital business model effectuation: An agile approach. *Computers in Human Behavior, 95*, 307-314.

Yamakawa, Y., Peng, M. W., & Deeds, D. L. (2010a). How does experience of previous entrepreneurial failure impact future entrepreneurship?. *Academy of Management, 1*, 1-5

Yamakawa, Y., Peng, M. W., & Deeds, D. L. (2010b). Revitalizing and learning from failure for future entrepreneurial growth. *Frontiers of Entrepreneurship Research, 30*(6), 1.

Yamakawa, Y., Peng, M. W., & Deeds, D. L. (2015). Rising from the ashes: Cognitive determinants of venture growth after entrepreneurial failure. *Entrepreneurship Theory and Practice*, *39*(2), 209-236.

Yu, X., Tao, Y., Tao, X., Xia, F., & Li, Y. (2018). Managing uncertainty in emerging economies: The interaction effects between causation and effectuation on firm performance. *Technological Forecasting and Social Change, 135*, 121-131.

Zacharakis, A. L., Meyer, G. D., & DeCastro, J. (1999). Differing perceptions of new venture failure: a matched exploratory study of venture capitalists and entrepreneurs. *Journal of Small Business Management, 37*(3), 1.

Zahra, S. A. (2008). Being entrepreneurial and market driven: implications for company performance. *Journal of Strategy and Management, 1*(2), 125-142.

Zahra, S. A. (2012). Organizational learning and entrepreneurship in family firms: Exploring the moderating effect of ownership and cohesion. *Small Business Economics, 38*(1), 51-65.

Zahra, S. A., Ireland, R. D., & Hitt, M. A. (2000). International expansion by new venture firms: International diversity, mode of market entry, technological learning, and performance. *Academy of Management Journal, 43*(5), 925-950.

Zahra, S. A., Neubaum, D. O., & Huse, M. (1997). The effect of the environment on export performance among telecommunications new ventures. *Entrepreneurship Theory and Practice, 22*(1), 25-46.

Zahra, S. A., Neubaum, D. O., & Larrañeta, B. (2007). Knowledge sharing and technological capabilities: The moderating role of family involvement. *Journal of Business Research, 60*(10), 1070-1079.

Zahra, S. A., Nielsen, A. P., & Bogner, W. C. (1999). Corporate entrepreneurship, knowledge, and competence development. *Entrepreneurship Theory and Practice, 23*(3), 169-189.

Zakay, D., Ellis, S., & Shevalsky, M. (2004). Outcome value and early warning indications as determinants of willingness to learn from experience. *Experimental Psychology, 51*(2), 150-157.

Zardkoohi, A. (2004). Do real options lead to escalation of commitment?. *Academy of Management Review, 29*(1), 111-119.

Zhang, J. J., Baden-Fuller, C., & Zhang, J. (2020). The Co-Existence of Causation and Effectuation in Entrepreneurial Network Development. *Academy of Management Proceedings*, 1. Briarcliff Manor, NY 10510: Academy of Management.

Zhang, S. X., & Cueto, J. (2015). The study of bias in entrepreneurship. *Entrepreneurship Theory and Practice*. 41(3), 419-454.

Zhao, H., Seibert, S. E., & Hills, G. E. (2005). The mediating role of self-efficacy in the development of entrepreneurial intentions. *Journal of Applied Psychology, 90*(6), 1265.

APPENDIX A

APPENDIX A

THE INSTRUMENT

A. Causation and Effectuation

CAUSATION α=.78
Experimentation α=.78
Affordable loss α=.85
Flexibility α=.70
Pre-commitments α=.86

To what extent do you agree with the following statements regarding your current venture?

(Five point Likert-type items, anchored by "strongly disagree" and "strongly agree.")

1. We analyzed long run opportunities and selected what we thought would provide the best returns.
2. We developed a strategy to best take advantage of resources and capabilities.
3. We designed and planned business strategies
4. We organized and implemented control processes to make sure we met objectives
5. We researched and selected target markets and did meaningful competitive analysis
6. We had a clear and consistent vision for where we wanted to end up
7. We designed and planned production and marketing efforts
8. We experimented with different products and/or business models.
9. The product/service that we now provide is essentially the same as originally conceptualized. (reverse coded)
10. The product/service that we now provide is substantially different than we first imagined.
11. We tried a number of different approaches until we found a business model that worked.
12. We were careful not to commit more resources than we could afford to lose.
13. We were careful not to risk more money than we were willing to lose with our initial idea.
14. We were careful not to risk so much money that the company would be in real trouble financially if things didn't work out.
15. We allowed the business to evolve as opportunities emerged.
16. We adapted what we were doing to the resources we had.
17. We were flexible and took advantage of opportunities as they arose.
18. We avoided courses of action that restricted our flexibility and adaptability.
19. We used a substantial number of agreements with customers, suppliers and other organizations and people to reduce the amount of uncertainty.

20. We used pre-commitments from customers and suppliers as often as possible.
21. Network contacts provided low cost resources.
22. By working closely with people/organizations external to our organization we have been able to greatly expand our capabilities.
23. We have focused on developing alliances with other people and organizations.
24. Our partnerships with outside organizations and people play a key role in our ability to provide our product/service.

B. Fear of failure ($\alpha = 0.83$)

(Four point Likert-type items, anchored by "strongly disagree" and "strongly agree.")

25. I am afraid of failing in somewhat difficult situations, when a lot depends on me.
26. I feel uneasy to do something if I am not sure of succeeding.
27. Even if nobody would notice my failure, I'm afraid of tasks, which I'm not able to solve.
28. Even if nobody is watching, I feel quite stressed in new situations.
29. If I do not understand a problem immediately I start feeling stressed.

C. Attitude toward failure → related to learning (Alpha 0.66)

To what extent do you agree with the following statements? (5 point likert scale)

30. Failures give opportunities for reflection and consideration.
31. Failures generally lead to positive outcomes in the long run.

D. Start-up Experience

32. Please indicate the total number of other new ventures that you have been involved in as a founder or a co-founder.

- None
- ……..

E. Business closure experience

33. Please indicate the total number of business closures that you have experienced as a founder or co-founder. (By closure we mean a situation in which a business entity discontinues in its existing form)

- None
- ……..

34. Which one of the following options describe the reason for the business closure(s) you experienced? (you can choose more than one option)

- Problems with making the business profitable.
- Difficulties in acquiring necessary resources.
- The business performed under expectations.
- Bankruptcy due to insolvency.
- To prevent further economic losses.
- Problems to keep up with the fast development on the market.
- Private reasons, such as ill health, family, etc.
- Alternative career opportunities, such as a job offer.
- Not Applicable, I have not experienced business closure

F. Counterfactual thinking

Baron (1999, 2000) and Markman et al. (2002, 2005) and Arora et al. (2013)

Think of up to three things they regretted most in their entire lives. This item was scored in terms of the total number of regrets reported by participants (range= 0–3). Additional items on the questionnaire asked individuals to rate on seven-point scales: (1) the frequency which they engaged in counterfactual thinking (imagining the possibility that things might have turned out differently in various situations if they had acted differently or circumstances had been different; "Rarely" to "Often"), (2) the intensity of regret they experienced as a result of thinking about missed opportunities ("Very Little" to "A Lot"), and (3) their feelings (affective reactions) when they thought about missed opportunities ("Unpleasant" to "Pleasant").

35. Please list three things you have regretted most related to your role as an entrepreneur.
    - ….
36. Please indicate how
37. Second Q
38. Third Q
39. Fourth Q

From Markman et al., 2005: To extend previous research on regretful thinking (Baron, 2000), this construct was treated as composed of three attributes of inventors' regrets: quantitative (count), qualitative (type), and magnitude (strength). The quantitative and qualitative measures were based on inventors' responses to an open-ended question: 'Think about your life and career and list the decisions that you regret most.' This single open-ended question generated two types of measures of regretful thinking: quantitative (count) and qualitative (type). First, because inventors could list as many regrets as they wished, the first measure was a simple count of the number of regrets inventors listed regardless of the content. Second, to identify the qualitative nature of participants' regretful thoughts, two management scholars -who are not the authors of this study-used content analysis to aggregate these regrets according to common themes. Because research on regretful thinking in this context is still exploratory, the themes emerge from the substance of the regrets themselves as inventors reported them. Although regrets were assessed independently, each rater has identified six common categories, including Business Opportunity, Education, Career, Value, Relationship, and Investment (see sample in Appendix II). Interrater consistency was high-92 per cent. Finally, the third measure of regretful thinking focused on the magnitude (strength) of inventors' regrets. This measure was culled from inventors' ranking, on a seven-point scale (1 =little regret; 7 = much regret), the overall strength or level of their regretful thinking. This was an all-encompassing measure, regardless of how many regrets (quantity) inventors listed or the type of their regrets (quality

From Punit Arora's email:

4. Consider the past three years, and list three events or actions that you regret most. Please confine your regrets to events or actions associated with your life as an entrepreneur (e.g. missed opportunities, unforeseen setbacks).

Regret A

Regret B

Regret C

5. While answering this question, please refer to your regrets listed above.

	How often do you find yourself reflecting upon this regret?	How intense is your regret over this event or action?	Describe how you feel emotionally when you reflect on this event or action
Regret A	Never	Extremely intense	Extremely unpleasant
Regret B	Sometimes	Somewhat	Neutral
Regret C	All the time	None at all	Extremely pleasant

G. Illusion of control (Alpha 0.67)

Subjects reported their responses to the three questions on a scale ranging from 1 ("strongly disagree") to 5 ("strongly agree").

I believe I could . . .

40. accurately predict total market demand for introducing new product.
41. accurately predict when larger competitors would enter the market.
42. succeed at making this venture a success, even though many other managers would fail.

H. Escalation of commitment

Scenario1: You are the Vice President of Operations for a mid-sized high-tech manufacturing firm. You have spent 1 (0, 5, or 9) million dollars and 6 (0, 18, or 32) months towards a research project to develop a radar scrambling device that would render a ship undetectable by conventional radar, in effect, a radar-blank ship. So far, you have invested a small (moderate or large) amount of funds, and time, compared with the 10 million dollars and 3 years normally budgeted for these types of projects. The engineering department has informed you that the project is 10 (90)% complete. You have just discovered that another firm has already begun marketing a similar product that takes up less space and is much easier to operate than your design. The decision you face now is to either abandon the project or authorize the next 1 million from the budget to continue this radar scrambling research project.

43. On the basis of the scenario, please determine (on a scale of 0 to 100) the extent to which you would continue investing in the aforementioned project. (0 = absolutely no, 50 = don't know, 100 = absolutely yes)

I. Risk Perception

Considering this scenario please for each scale below, kindly circle the number which you feel best assesses the amount of RISK associated with this business: (alpha=0.95)

44. HIGH 1 2 3 4 5 6 7 LOW
45. MINIMAL 1 2 3 4 5 6 7 EXTREME
46. VERY RISKY 1 2 3 4 5 6 7 NOT RISKY

Scenario 2:

47. On the basis of the scenario, please determine (on a scale of 0 to 100) the extent to which you would continue investing in the aforementioned project.

*********Risk Perception Questions repeated********

Considering this scenario please for each scale below, kindly circle the number which you feel best assesses the amount of RISK associated with this business: (alpha=0.95)

48. HIGH 1 2 3 4 5 6 7 LOW
49. MINIMAL 1 2 3 4 5 6 7 EXTREME
50. VERY RISKY 1 2 3 4 5 6 7 NOT RISKY

Scenario 3:

51. On the basis of the scenario, please determine (on a scale of 0 to 100) the extent to which you would continue investing in the aforementioned project.

*********Risk Perception Questions repeated********

Considering this scenario please for each scale below, kindly circle the number which you feel best assesses the amount of RISK associated with this business: (alpha=0.95)

52. HIGH 1 2 3 4 5 6 7 LOW
53. MINIMAL 1 2 3 4 5 6 7 EXTREME
54. VERY RISKY 1 2 3 4 5 6 7 NOT RISKY

J. Subjective performance measure → as a proxy for perception of potential failure

Please evaluate the performance of your firm relative to the performance of your principal competitors in the past 3 years in terms of:

(5-point Likert scale ranging from “much lower than the competitors” (1) to “much higher than the competitors” (5))

55. sales growth rate
56. market share
57. pretax profit growth rate
58. overall performance

K. Critical setback experience By Politis and Gabrielsson, 2009 (alpha= 0.76)

Six-item, five-point scale

Please rate the extent (1 ¼ very low extent, 5 ¼ very high extent) to which you have experienced a number of critical setbacks in the new venture creation process.

59. developing a new product/service;
60. finding competent employees for the new venture;
61. communicating with external stakeholders;

62. finding long-term finance for the new venture;
63. finding a profitable market niche for a product/service;
64. finding a customer base for a product/service.

L. Organizational learning

https://link.springer.com/content/pdf/10.1007%2Fs11187-010-9266-7.pdf
Zahra, 2012

The breadth, depth, and speed of organizational learning were measured using five-item indices each, as reported in the Appendix. Items were extracted from the literature (Huber 1991; Pe´rez-Nordtvedt et al. 2008; Zahra et al. 2000). In each case, scores were summed and then divided by the number of items used, and the average score was then used. The three scales were reliable (breadth, ten items, a = 0.71; depth, seven items, a = 0.70; and speed, six items, a = 0.72).

Breadth of organizational learning

How would you describe your company's ability to learn about the following issues over the past 3 years? For each item, please **circle** the one number that best describes your response.

	Little learning				**A great deal of learning**
• Changes in your competition	1	2	3	4	5
• Changes in your competitors' strategies	1	2	3	4	5
• Changes in your industry	1	2	3	4	5
• Changes in technological conditions	1	2	3	4	5
• Changes in demographics	1	2	3	4	5
• Changes in the regulatory environment	1	2	3	4	5
• Developing new products	1	2	3	4	5
• Commercializing new products	1	2	3	4	5
• Being responsive to customer needs	1	2	3	4	5
• Responding quickly to competitive forces	1	2	3	4	5

Depth of organizational learning

How thoroughly has your company analyzed the following issues over the past 3 years? For each item, please **circle** the one number that best describes your response.

	Strongly disagree				**Strongly agree**
To understand industry trends, this company thoroughly analyzes:					
• … causes of success & failure in the industry.	1	2	3	4	5
• … competitors' assumptions about the industry.	1	2	3	4	5
• … shifts in competitors' market positions.	1	2	3	4	5
• … lessons learned from strategy implementation.	1	2	3	4	5
• … competitors' intentions.	1	2	3	4	5
• … factors underlying technological changes.	1	2	3	4	5
• … analyzing factors underlying regulatory changes.	1	2	3	4	5

Speed of organizational learning

How would you describe the speed at which your company has been able to learn about the following issues over the past 3 years? For each item, please **circle** the one number that best describes your response.

	Very slow				**Very fast**
• Technological changes	1	2	3	4	5
• Regulatory changes	1	2	3	4	5
• Demographic changes	1	2	3	4	5
• Political changes	1	2	3	4	5
• Competitive changes	1	2	3	4	5
• Market trends	1	2	3	4	5

M. Control Variables

65. Please provide an approximate value of your business: ----------
66. How many partners do you have in your business?
    - None, I am the sole owner of the business.
    - 1
    - 2 or 3
    - More than 3
67. What is the age of your company?
    - Below 1 year
    - Between 1 and 3 years
    - Between 3 and 5 years
    - Above 5 years
68. Are you male or female?
    - Male
    - Female
69. Which category below includes your age?
    - 17 or younger
    - 18-20
    - 21-29
    - 30-39
    - 40-49
    - 50-59
    - 60 or older Below 20
70. Please specify your ethnicity.
    - White
    - Hispanic or Latino
    - Black or African American
    - Native American or American Indian
    - Asian / Pacific Islander
    - Other
71. What is the highest level of school you have completed or the highest degree you have received?
    - Less than high school degree
    - High school degree or equivalent (e.g., GED)
    - Some college but no degree
    - Associate degree
    - Bachelor's degree
    - Graduate degree

72. What is your marital status?
    - Single, never married
    - Married or domestic partnership
    - Widowed
    - Divorced
    - Separated
73. Have you ever studied any course of entrepreneurship?
    - Yes
    - No
74. Which of the following categories best describes your employment status?
    - Only self-Employed
    - Self-employed and paid-employed (You are self-employed and also work for an employer)
    - Retired and self-employed

APPENDIX B

APPENDIX B

DATA ANALYSIS

Process Model 29

```
Run MATRIX procedure:

***************** PROCESS Procedure for SPSS Version 3.4 *****************

        Written by Andrew F. Hayes, Ph.D.       www.afhayes.com
    Documentation available in Hayes (2018). www.guilford.com/p/hayes3

**************************************************************************
Model  : 29
    Y  : LEARN
    X  : EFFECT
   M1  : CT
   M2  : IC
    W  : CSE
    Z  : LAF

Sample
Size:  397

**************************************************************************
OUTCOME VARIABLE:
 CT

Model Summary
        R       R-sq        MSE          F       df1       df2          p
     .6847     .4688     .3695   115.6017    3.0000   393.0000     .0000

Model
            coeff         se          t          p       LLCI       ULCI
constant   7.7440     .8657    8.9456     .0000    6.0421    9.4460
EFFECT     -.8550     .1739   -4.9162     .0000   -1.1970    -.5131
CSE          .0143     .2791     .0511     .9593    -.5344     .5629
Int_1        .0010     .0560     .0184     .9854    -.1091     .1112

Product terms key:
 Int_1    :       EFFECT   x       CSE

Test(s) of highest order unconditional interaction(s):
      R2-chng          F       df1       df2          p
X*W      .0000     .0003    1.0000   393.0000     .9854

**************************************************************************
```

OUTCOME VARIABLE:
IC

Model Summary

R	R-sq	MSE	F	df1	df2	p
.3193	.1020	.3233	14.8767	3.0000	393.0000	.0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	5.1619	.8098	6.3743	.0000	3.5698	6.7540
EFFECT	-.2844	.1627	-1.7483	.0812	-.6043	.0354
CSE	-.2118	.2611	-.8111	.4178	-.7250	.3015
Int_1	.0160	.0524	.3051	.7605	-.0871	.1190

Product terms key:
Int_1 : EFFECT x CSE

Test(s) of highest order unconditional interaction(s):

	R2-chng	F	df1	df2	p
X*W	.0002	.0931	1.0000	393.0000	.7605

****
OUTCOME VARIABLE:
LEARN

Model Summary

R	R-sq	MSE	F	df1	df2	p
.5388	.2903	.3578	17.5923	9.0000	387.0000	.0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	9.8746	4.0841	2.4178	.0161	1.8448	17.9045
EFFECT	.2228	.4497	.4955	.6205	-.6613	1.1070
CT	-1.2324	.4507	-2.7346	.0065	-2.1185	-.3463
IC	-1.2241	.4119	-2.9720	.0031	-2.0338	-.4143
CSE	1.1901	.2798	4.2535	.0000	.6400	1.7402
Int_1	-.2360	.0561	-4.2066	.0000	-.3463	-.1257
LAF	-2.0944	.8767	-2.3889	.0174	-3.8182	-.3707
Int_2	.1368	.0908	1.5062	.1328	-.0418	.3153
Int_3	.2538	.0996	2.5487	.0112	.0580	.4496
Int_4	.2635	.0919	2.8678	.0044	.0828	.4441

Product terms key:
Int_1 : EFFECT x CSE
Int_2 : EFFECT x LAF
Int_3 : CT x LAF
Int_4 : IC x LAF

Test(s) of highest order unconditional interaction(s):

	R2-chng	F	df1	df2	p
X*W	.0324	17.6956	1.0000	387.0000	.0000
X*Z	.0042	2.2686	1.0000	387.0000	.1328
BOTH(X)	.0380	10.3532	2.0000	387.0000	.0000
M1*Z	.0119	6.4958	1.0000	387.0000	.0112
M2*Z	.0151	8.2241	1.0000	387.0000	.0044

Focal predict: EFFECT (X)
Mod var: CSE (W)
Mod var: LAF (Z)

Conditional effects of the focal predictor at values of the moderator(s):

CSE	LAF	Effect	se	t	p	LLCI	ULCI
2.2855	3.7860	.2013	.1001	2.0110	.0450	.0045	.3982
2.2855	4.3999	.2853	.0787	3.6242	.0003	.1305	.4401
2.2855	5.0000	.3674	.0920	3.9938	.0001	.1865	.5482
3.0596	3.7860	.0187	.0923	.2024	.8397	-.1627	.2000
3.0596	4.3999	.1026	.0703	1.4597	.1452	-.0356	.2409
3.0596	5.0000	.1847	.0864	2.1382	.0331	.0149	.3546
3.8337	3.7860	-.1640	.1038	-1.5805	.1148	-.3680	.0400
3.8337	4.3999	-.0800	.0864	-.9267	.3546	-.2499	.0898
3.8337	5.0000	.0020	.1012	.0201	.9840	-.1969	.2009

Focal predict: CT (M1)
Mod var: LAF (Z)

Conditional effects of the focal predictor at values of the moderator(s):

LAF	Effect	se	t	p	LLCI	ULCI
3.7860	-.2716	.0870	-3.1205	.0019	-.4427	-.1005
4.3999	-.1158	.0515	-2.2492	.0251	-.2170	-.0146
5.0000	.0365	.0711	.5134	.6080	-.1033	.1764

Focal predict: IC (M2)
Mod var: LAF (Z)

Conditional effects of the focal predictor at values of the moderator(s):

LAF	Effect	se	t	p	LLCI	ULCI
3.7860	-.2265	.0809	-2.8001	.0054	-.3855	-.0674
4.3999	-.0647	.0539	-1.2020	.2301	-.1706	.0411
5.0000	.0934	.0741	1.2605	.2082	-.0523	.2391

********** DIRECT AND INDIRECT EFFECTS OF X ON Y **********

Conditional direct effect(s) of X on Y:

CSE	LAF	Effect	se	t	p	LLCI	ULCI
2.2855	3.7860	.2013	.1001	2.0110	.0450	.0045	.3982
2.2855	4.3999	.2853	.0787	3.6242	.0003	.1305	.4401
2.2855	5.0000	.3674	.0920	3.9938	.0001	.1865	.5482
3.0596	3.7860	.0187	.0923	.2024	.8397	-.1627	.2000
3.0596	4.3999	.1026	.0703	1.4597	.1452	-.0356	.2409
3.0596	5.0000	.1847	.0864	2.1382	.0331	.0149	.3546
3.8337	3.7860	-.1640	.1038	-1.5805	.1148	-.3680	.0400
3.8337	4.3999	-.0800	.0864	-.9267	.3546	-.2499	.0898
3.8337	5.0000	.0020	.1012	.0201	.9840	-.1969	.2009

Conditional indirect effects of X on Y:

INDIRECT EFFECT:
EFFECT -> CT -> LEARN

CSE	LAF	Effect	BootSE	BootLLCI	BootULCI
2.2855	3.7860	.2316	.0744	.0896	.3805
2.2855	4.3999	.0987	.0394	.0257	.1791
2.2855	5.0000	-.0311	.0574	-.1442	.0839
3.0596	3.7860	.2313	.0755	.0875	.3860
3.0596	4.3999	.0986	.0401	.0254	.1816
3.0596	5.0000	-.0311	.0573	-.1438	.0830
3.8337	3.7860	.2311	.0787	.0851	.3970
3.8337	4.3999	.0985	.0415	.0246	.1873
3.8337	5.0000	-.0311	.0574	-.1439	.0837

Index of moderated moderated mediation

Index	BootSE	BootLLCI	BootULCI
.0003	.0157	-.0347	.0320

Indices of conditional moderated mediation by W

LAF	Index	BootSE	BootLLCI	BootULCI
3.7860	-.0003	.0164	-.0312	.0359
4.3999	-.0001	.0072	-.0133	.0162
5.0000	.0000	.0044	-.0087	.0099

INDIRECT EFFECT:
EFFECT -> IC -> LEARN

CSE	LAF	Effect	BootSE	BootLLCI	BootULCI
2.2855	3.7860	.0561	.0295	.0094	.1241
2.2855	4.3999	.0160	.0156	-.0105	.0504
2.2855	5.0000	-.0232	.0199	-.0684	.0115
3.0596	3.7860	.0533	.0257	.0105	.1095
3.0596	4.3999	.0152	.0143	-.0101	.0457
3.0596	5.0000	-.0220	.0181	-.0611	.0106
3.8337	3.7860	.0505	.0248	.0088	.1052
3.8337	4.3999	.0144	.0136	-.0097	.0442
3.8337	5.0000	-.0208	.0173	-.0575	.0101

Index of moderated moderated mediation

Index	BootSE	BootLLCI	BootULCI
.0042	.0136	-.0194	.0370

Indices of conditional moderated mediation by W

LAF	Index	BootSE	BootLLCI	BootULCI
3.7860	-.0036	.0118	-.0316	.0169
4.3999	-.0010	.0042	-.0117	.0061
5.0000	.0015	.0059	-.0088	.0165

********** ANALYSIS NOTES AND ERRORS **********

Level of confidence for all confidence intervals in output:
95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
5000

W values in conditional tables are the mean and +/- SD from the mean.

Z values in conditional tables are 1 SD below the mean, the mean, and the maximum.

NOTE: One SD above the mean is above the maximum observed in the data for Z,
so the maximum measurement for Z is used for conditioning instead.

------ END MATRIX -----

Process Model 16

Run MATRIX procedure:

********** PROCESS Procedure for SPSS Version 3.4 **********

Written by Andrew F. Hayes, Ph.D. www.afhayes.com
Documentation available in Hayes (2018). www.guilford.com/p/hayes3

****

Model : 16
Y : LEXIT
X : EFFECT
M1 : CT
M2 : IC
W : FF
Z : EC

Sample
Size: 397

****

OUTCOME VARIABLE:
CT

Model Summary

R	R-sq	MSE	F	df1	df2	p
.6844	.4685	.3678	348.1156	1.0000	395.0000	.0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	7.7852	.2302	33.8256	.0000	7.3327	8.2377
EFFECT	-.8514	.0456	-18.6579	.0000	-.9411	-.7617

****

OUTCOME VARIABLE:
IC

Model Summary

R	R-sq	MSE	F	df1	df2	p
.2686	.0722	.3324	30.7196	1.0000	395.0000	.0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	4.5387	.2188	20.7458	.0000	4.1086	4.9689
EFFECT	-.2404	.0434	-5.5425	.0000	-.3257	-.1551

****

OUTCOME VARIABLE:
LEXIT

Model Summary

R	R-sq	MSE	F	df1	df2	p
.8255	.6815	142.7702	91.9985	9.0000	387.0000	.0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	138.5763	17.3939	7.9669	.0000	104.3779	172.7747
EFFECT	-.8931	1.3126	-.6804	.4967	-3.4739	1.6877
CT	8.6256	2.4524	3.5172	.0005	3.8039	13.4473
IC	-40.7193	3.6656	-11.1085	.0000	-47.9263	-33.5124
FF	-15.0644	6.5518	-2.2993	.0220	-27.9461	-2.1828
Int_1	.9906	1.0934	.9060	.3655	-1.1592	3.1405
Int_2	3.8603	1.6210	2.3814	.0177	.6732	7.0473
EC	-.8001	.2003	-3.9952	.0001	-1.1939	-.4064
Int_3	-.1453	.0351	-4.1452	.0000	-.2143	-.0764

```
Int_4        .2878     .0455     6.3264     .0000     .1984     .3773

Product terms key:
 Int_1   :       CT      x       FF
 Int_2   :       IC      x       FF
 Int_3   :       CT      x       EC
 Int_4   :       IC      x       EC

Test(s) of highest order unconditional interaction(s):
          R2-chng          F       df1        df2          p
M1*W         .0007     .8208     1.0000   387.0000     .3655
M1*Z         .0141   17.1830     1.0000   387.0000     .0000
BOTH(M1)     .0151    9.1864     2.0000   387.0000     .0001
M2*W         .0047    5.6712     1.0000   387.0000     .0177
M2*Z         .0329   40.0237     1.0000   387.0000     .0000
BOTH(M2)     .0716   43.5206     2.0000   387.0000     .0000
----------
   Focal predict: CT       (M1)
        Mod var: FF        (W)
        Mod var: EC        (Z)

Conditional effects of the focal predictor at values of the moderator(s):

       FF        EC     Effect         se          t          p       LLCI       ULCI
    1.3662   33.2843     5.1416     1.2998     3.9556     .0001     2.5860     7.6972
    1.3662   57.6826     1.5957     1.3041     1.2236     .2218     -.9683     4.1597
    1.3662   82.0810    -1.9502     1.7819    -1.0945     .2744    -5.4537     1.5532
    2.1128   33.2843     5.8813     1.2768     4.6063     .0000     3.3710     8.3917
    2.1128   57.6826     2.3354     1.0042     2.3257     .0206      .3611     4.3097
    2.1128   82.0810    -1.2105     1.3601     -.8900     .3740    -3.8847     1.4636
    2.8595   33.2843     6.6210     1.7042     3.8852     .0001     3.2705     9.9716
    2.8595   57.6826     3.0751     1.2843     2.3945     .0171      .5501     5.6001
    2.8595   82.0810     -.4709     1.3631     -.3454     .7300    -3.1508     2.2091
----------
   Focal predict: IC       (M2)
        Mod var: FF        (W)
        Mod var: EC        (Z)

Conditional effects of the focal predictor at values of the moderator(s):

       FF        EC     Effect         se          t          p       LLCI       ULCI
    1.3662   33.2843   -25.8657     1.9919   -12.9854     .0000   -29.7820   -21.9494
    1.3662   57.6826   -18.8433     2.0995    -8.9753     .0000   -22.9711   -14.7155
    1.3662   82.0810   -11.8209     2.7041    -4.3715     .0000   -17.1375    -6.5044
    2.1128   33.2843   -22.9833     1.6767   -13.7078     .0000   -26.2798   -19.6868
    2.1128   57.6826   -15.9609     1.3442   -11.8737     .0000   -18.6038   -13.3180
    2.1128   82.0810    -8.9385     1.8075    -4.9454     .0000   -12.4922    -5.3849
    2.8595   33.2843   -20.1008     2.1412    -9.3877     .0000   -24.3107   -15.8910
    2.8595   57.6826   -13.0785     1.4615    -8.9485     .0000   -15.9520   -10.2050
    2.8595   82.0810    -6.0561     1.4669    -4.1286     .0000    -8.9401    -3.1721

****************** DIRECT AND INDIRECT EFFECTS OF X ON Y *****************

Direct effect of X on Y
    Effect         se          t          p       LLCI       ULCI
    -.8931     1.3126     -.6804      .4967    -3.4739     1.6877

Conditional indirect effects of X on Y:

INDIRECT EFFECT:
 EFFECT     ->    CT         ->    LEXIT
```

```
      FF        EC     Effect     BootSE   BootLLCI   BootULCI
    1.3662   33.2843   -4.3775     1.5362   -7.6141   -1.5482
    1.3662   57.6826   -1.3585     1.3734   -4.0805    1.3330
    1.3662   82.0810    1.6604     1.7655   -1.7059    5.3037
    2.1128   33.2843   -5.0073     1.5012   -8.1777   -2.2853
    2.1128   57.6826   -1.9883     1.0842   -4.2671     .0293
    2.1128   82.0810    1.0306     1.3425   -1.4887    3.7678
    2.8595   33.2843   -5.6370     1.7136   -9.2887   -2.5657
    2.8595   57.6826   -2.6181     1.1199   -4.9727    -.6174
    2.8595   82.0810     .4009     1.1299   -1.8507    2.6346

     Indices of partial moderated mediation:
       Index     BootSE   BootLLCI   BootULCI
FF    -.8434     .8414   -2.5463     .7802
EC     .1237     .0378     .0533     .2021
---

INDIRECT EFFECT:
 EFFECT     ->   IC        ->   LEXIT

      FF        EC     Effect     BootSE   BootLLCI   BootULCI
    1.3662   33.2843    6.2184     1.3868    3.5996    9.1248
    1.3662   57.6826    4.5301     1.0467    2.5500    6.7398
    1.3662   82.0810    2.8419      .9189    1.0718    4.6898
    2.1128   33.2843    5.5254     1.3012    3.1853    8.2893
    2.1128   57.6826    3.8372      .8638    2.2046    5.6369
    2.1128   82.0810    2.1489      .6124    1.0162    3.4276
    2.8595   33.2843    4.8324     1.3220    2.6928    7.7470
    2.8595   57.6826    3.1442      .8251    1.7509    4.9632
    2.8595   82.0810    1.4560      .4360     .6837    2.4069

     Indices of partial moderated mediation:
       Index     BootSE   BootLLCI   BootULCI
FF    -.9281     .5049   -1.8819     .1296
EC    -.0692     .0220    -.1200    -.0354
---

************************ ANALYSIS NOTES AND ERRORS ************************

Level of confidence for all confidence intervals in output:
  95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
  5000

W values in conditional tables are the mean and +/- SD from the mean.

Z values in conditional tables are the mean and +/- SD from the mean.

------ END MATRIX -----
```

Process Model 2

```
Run MATRIX procedure:

***************** PROCESS Procedure for SPSS Version 3.4 *****************
```

Written by Andrew F. Hayes, Ph.D. www.afhayes.com
Documentation available in Hayes (2018). www.guilford.com/p/hayes3

****
Model : 2
Y : LEXIT
X : CSE
W : FF
Z : EC

Sample
Size: 397

****
OUTCOME VARIABLE:
LEXIT

Model Summary

R	R-sq	MSE	F	df1	df2	p
.6937	.4812	230.1649	72.5301	5.0000	391.0000	.0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	8.9289	9.8737	.9043	.3664	-10.4833	28.3412
CSE	11.3594	3.1771	3.5754	.0004	5.1132	17.6057
FF	8.0404	4.6428	1.7318	.0841	-1.0875	17.1683
Int_1	-2.0490	1.5291	-1.3401	.1810	-5.0552	.9572
EC	-.3232	.1589	-2.0342	.0426	-.6356	-.0108
Int_2	-.0877	.0491	-1.7845	.0751	-.1843	.0089

Product terms key:
Int_1 : CSE x FF
Int_2 : CSE x EC

Test(s) of highest order unconditional interaction(s):

	R2-chng	F	df1	df2	p
X*W	.0024	1.7958	1.0000	391.0000	.1810
X*Z	.0042	3.1843	1.0000	391.0000	.0751
BOTH	.0138	5.1912	2.0000	391.0000	.0060

Focal predict: CSE (X)
Mod var: FF (W)
Mod var: EC (Z)

Conditional effects of the focal predictor at values of the moderator(s):

FF	EC	Effect	se	t	p	LLCI	ULCI
1.3662	33.2843	5.6411	1.5592	3.6180	.0003	2.5757	8.7066
1.3662	57.6826	3.5014	1.5043	2.3277	.0204	.5440	6.4589
1.3662	82.0810	1.3617	2.2294	.6108	.5417	-3.0213	5.7448
2.1128	33.2843	4.1111	1.6197	2.5383	.0115	.9268	7.2955
2.1128	57.6826	1.9714	1.0062	1.9593	.0508	-.0068	3.9497
2.1128	82.0810	-.1683	1.5090	-.1115	.9113	-3.1350	2.7985
2.8595	33.2843	2.5812	2.3287	1.1084	.2684	-1.9971	7.1594
2.8595	57.6826	.4415	1.5392	.2868	.7744	-2.5847	3.4676
2.8595	82.0810	-1.6983	1.4802	-1.1473	.2520	-4.6085	1.2120

********************** ANALYSIS NOTES AND ERRORS ************************

Level of confidence for all confidence intervals in output:

95.0000

W values in conditional tables are the mean and +/- SD from the mean.

Z values in conditional tables are the mean and +/- SD from the mean.

------ END MATRIX -----

BIOGRAPHICAL SKETCH

The author, Azadeh Zamanian, was born on August 11, 1985, in Tehran, IRAN. She received her bachelor's degree in the field of computer engineering from Mazandaran University of Science and Technology in IRAN. Following her undergraduate studies, she worked as quality control specialist, project engineer, and sales supervisor. She continued her education and received her master's degree in the field of Business Administration from the University of Greenwich in Deventer, The Netherlands. She got admitted into the PhD program at the University of Texas – Rio Grande Valley in the field of Management and received her PhD in 2021.

Mailing Address: 11409 Academy Ridge Rd. NE, Albuquerque, NM 87111, USA

Email Address: azade.zamanian@gmail.com