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<https://doi.org/10.18297/etd/1049>

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EXPERIENCE, EFFECTUATION, AND SOMETHING GOOD
DOES THE USE OF EFFECTUATION LEAD TO POSITIVE OUTCOMES?

By

Thomas E. Nelson
B.A., Ball State University, 2005
M.B.A. Ball State University, 2006

A Dissertation
Submitted to the Faculty of the
College of Business and Entrepreneurship of the University of Louisville
in Partial Fulfillment of the Requirements
for the Degree of

Doctor of Philosophy

Department of Management and Entrepreneurship
University of Louisville
Louisville, Kentucky

December 2012

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Does the use of effectuation lead to positive outcomes?

By

Thomas E. Nelson
BA Ball State University, 2005
MBA Ball State University, 2006

A Dissertation Approved on

August 23, 2012

By the following Dissertation Committee

Bruce Kemelgor
Dissertation Director

James O. Fiet

Lynn H. Boyd

Michael G. Goldsby

DEDICATION

This dissertation is dedicated to Annie, without whom I never would have had the motivation to begin, the burning desire to see it through, or the will to finish it. I do this, as I live--not to have you, but to deserve you.

And also, to those I lost along the way, Larry Gullette, who provided me with a 15 year diversion into business, which my students benefit from every day, and Garry Butterman, who taught me much about how to live. I love you.

ACKNOWLEDGEMENTS

The list of people who deserve my thanks and undying gratitude would be longer than the document which follows. But an attempt must be made, and with that attempt, I offer my apologies for those who are inadvertently left out.

First, thank you to professors Goldsby and Hornsby for encouraging me to check out an experimental new entrepreneurship program in Kentucky. Second, thank you professor Fiet for designing and implementing the best PhD entrepreneurship program on the planet, and allowing me to be a part of it. Third, thank you to all my peers over the past several years who made me realize that the Louisville program was so special. Thank you to all the professors, visiting and full time that pushed, prodded and challenged me. Scott Shane, thank you for championing hard science in entrepreneurship. Howard Aldrich, thank you for the big picture, and for teaching us as much in 30 hours as Chuck Hofer did in 90. Thanks Chuck for spending the 90 with us. It was exhausting, but completely worth it. Thanks to the late Bruce Kirchoff, for telling me that I could write, and for reinforcing everything I have ever believed about entrepreneurship. Thanks Dean Shepherd for helping to crack open the minds of entrepreneurs. Thanks Per Davidsson, Art Adams, Reg Bruce and Richard Germain for teaching me the hows and whys of research. Thank you Lynn Boyd, for all your help. Thanks Melissa Baucus, for office toys, and for Ishmael. Finally, thank you Professor

Kemelgor. I could not have had a better friend, mentor, and dissertation chair. I hope to someday be half as valuable to my institution as you are to yours.

ABSTRACT

EXPERIENCE, EFFECTUATION, AND SOMETHING GOOD

DOES THE USE OF EFFECTUATION LEAD TO POSITIVE OUTCOMES?

Thomas E. Nelson

August 23, 2012

The theory of effectuation is ascending in entrepreneurship education. Hundreds of articles have been written on the topic. Many textbooks mention the theory, and one college level textbook teaches entrepreneurship entirely from an effectual perspective. Given its acceptance, the natural assumption is that effectuation is somehow ‘good.’ That is, there is some unique benefit that an entrepreneur gains from using effectuation.

This dissertation examines the concept of effectuation, and its value to entrepreneurship. It seeks to determine if entrepreneurs who use effectual logic outperform entrepreneurs who don’t. Four hundred and fifty entrepreneurs across three states are surveyed to determine if and how much they effectuate, their business’s performance, and their satisfaction with their business’s performance, as well as their lives overall.

Findings indicate that entrepreneurs with more experience adopt the effectual idea of seeking out pre-commitments before starting a new venture. Findings also indicate that the entrepreneur’s perception of his business’s financial performance is positively related

to his or her inclination to experiment, be flexible, and to evaluate business opportunities by considering how much he or she can afford to lose.

TABLE OF CONTENTS

| | |
|--|----|
| CHAPTER ONE - INTRODUCTION..... | 1 |
| Background..... | 1 |
| Research Question..... | 5 |
| Outline for Dissertation..... | 6 |
| CHAPTER TWO - LITERATURE REVIEW..... | 7 |
| Effectuation, The theory..... | 7 |
| Effectuation, Empirical findings..... | 13 |
| Effectuation and Experience..... | 17 |
| Direct Observation and Learning..... | 18 |
| Start-Up Hazards..... | 20 |
| Effectuation Logics..... | 22 |
| Experimentation..... | 23 |
| Affordable Loss..... | 24 |
| Flexibility..... | 25 |
| Pre-Commitments..... | 26 |
| Effectuation, Performance, and Satisfaction..... | 27 |

| | |
|--|----|
| CHAPTER THREE - METHOD..... | 31 |
| Sample..... | 33 |
| Model | 34 |
| Start-up Experience..... | 36 |
| Effectuation | 37 |
| Satisfaction with Firm Performance..... | 39 |
| Entrepreneur’s overall satisfaction with his or her business | 40 |
| Control Variables | 41 |
| Data Collection..... | 43 |
| Data Analysis | 44 |
| Hypotheses 1a through 1d..... | 45 |
| Hypotheses 2a through 2d | 46 |
| Hypotheses 3a through 3d | 47 |
| CHAPTER FOUR - RESULTS | 48 |
| Sample preparation and analysis | 48 |
| Measures..... | 49 |
| Start Up Experience..... | 49 |
| Effectuation | 50 |
| Satisfaction With Firm Performance | 51 |
| Entrepreneur’s Overall Satisfaction with His or Her Business | 52 |

| | |
|--|----|
| Control Variables..... | 53 |
| Results | 54 |
| Supported Hypotheses | 55 |
| Summary of Results..... | 59 |
| CHAPTER FIVE - CONCLUSION | 60 |
| Discussion | 60 |
| Conclusion..... | 63 |
| Limitations | 64 |
| Directions for Future Research | 66 |
| REFERENCES | 67 |
| APPENDICES | 75 |
| Appendix 1: The Survey Instrument..... | 75 |
| Appendix 2: The Tables | 78 |
| Figure One | 78 |
| Table One | 79 |
| Table Two..... | 81 |
| Table Three..... | 82 |
| Table Four..... | 83 |
| CURRICULUM VITAE..... | 84 |

CHAPTER ONE - INTRODUCTION

Background

From the earliest stages of opportunity search/creation/discovery, through resource acquisition, product/service development, funding, business launch and operation, and eventually to the entrepreneur's liquidating his position in a business, through failure, closure, or sale, the entrepreneurial process is more or less a continual exercise in decision-making (Barreto, 1989; Cantillon, 1755; Hébert & Link, 1989). The stakes are high. Only half of all small businesses started in the United States survive five years or more (SBA, 2010).

Because decision-making is integral to entrepreneurship, scholars have studied it from many angles. Script processing (Abelson, 1976), biases (Busenitz & Barney, 1997), overconfidence (Zacharakis & Shepherd, 2001), cognition (Forbes & Milliken, 1999), politics (Eisenhardt & Bourgeois III, 1988), and power (Miller, 1983) have all been examined. The research indicates that decision-making is a process (Lyon, Lumpkin, & Dess, 2000; Wally & Baum, 1994; Zacharakis & Meyer, 1998). This process happens under uncertainty (Knight & Jones, 2002), leading to the entrepreneur's inability to predict outcomes (Dunning, Heath, & Suls, 2004; Miller, 2007). Thus, strategies that somehow mitigate a lack of information and/or predictive accuracy would be quite valuable to entrepreneurs. Some strategies for dealing with entrepreneurial uncertainty that have been investigated are bricolage (Baker & Nelson, 2005), effectuation

(Sarasvathy, 2001), improvisation (Hmieleski & Corbett, 2006), real options reasoning (McGrath, 1999), and constrained, systematic search (Fiet, 2002). These strategies can be divided into two groups. Bricolage, effectuation, and improvisation embrace uncertainty, and attempt to turn unforeseen situations to business advantage, whereas real options reasoning and systematic search seek to reduce uncertainty.

In tandem with decision-making is action. In order to start a business, it is necessary to both *decide* to start a business, and *actually start* a business. These phenomena can occur in either order (Hienerth, 2006; Sarasvathy, 2001; Utterback, 1996), but neither, by itself, is sufficient to establish a viable, on-going business. That is, some individuals begin engaging in what could potentially be business activity, such as developing, and selling products in an undirected fashion, often developing a customer base among friends and acquaintances whereas other individuals make decisions and plans, but never act. Without both the intent to start a business, as well as business activity, this would typically be categorized as a hobby, or a pre-firm undertaking (Sarasvathy, 1998). A decision, combined with acting on that decision, could lead towards the moment when a firm is born.

Even so, starting a business is not instantaneous in nature. Business start-up processes, whether characterized by (1) the table of contents in entrepreneurship textbooks (e.g. Kuratko, 2008), (2) the deal flow diagrams of venture capitalists (Gompers & Lerner, 2004), or (3) the seemingly more emergent approach described by effectuation (Sarasvathy, 2001), all rely on an underlying concept of decision-making and action. In the first two examples, the underlying structure can be described as orderly, logical, methodic, deterministic, and causal. In the third, the seeming lack of structure

that describes effectuation can be characterized as chaotic (by comparison), non-logical, non-methodic and anti-deterministic¹.

Effectuation is defined in terms of causation. The first version of this definition set was “Causation processes take a particular effect as given and focus on selecting between means to create that effect. Effectuation processes take a set of means as given and focus on selecting between possible effects that can be created with that set of means.”(Sarasvathy, 2001) There have been many revisions since, focusing on the causation and effectuation as antitheses, and to one degree or another attempting to equate causation with predicting the future and effectuation with controlling that future without predicting it. A more recent version, found on Wikipedia, is “Effectuation is a set of decision-making principles expert entrepreneurs are observed to employ in situations of uncertainty. The alternative to effectuation is causality, which describes decision-making heuristics rooted in prediction.”

Is effectuation learned through the business development process? Effectuation, if learned through experience, is likely discovered through trial and error. Imagine a price increase from a supplier motivating an entrepreneur to look into alternate suppliers, where a new product line is discovered, modifying, or even transforming, his or her business. For example, a certain manufacturer of key blanks announces a 30% across the board increase in prices. One locksmith finds an alternate distributor and his product mix changes significantly because of it. A second raises her prices. A third, after some research, decides to specialize in keyless entry systems, and later, because the new

¹ In this context anti-deterministic means that antecedent causes do not necessarily lead to predictable effects.

supplier carries them, moves into the alarm business. This is an example of the effectual logics named *crazy-quilt* and *lemonade*. *Effectuation* is “the focus on using a set of evolving means to achieve new and different goals. Effectuation evokes creative and transformative tactics. *Effectual logic* is the name given to heuristics used by expert² entrepreneurs in new venture creation” (Read, Sarasvathy, Dew, Wiltbank, & Ohlsson, 2011 p.7).

A majority of expert entrepreneurs “effectuate more than half the time, both in the number of decisions they make using effectual criteria, and in the number of stakeholder relationships they generate and sustain” (Sarasvathy, 2008 p.48). This conclusion, described as conservative in Sarasvathy’s aforementioned book, leads to the assumptions that some entrepreneurs do not effectuate, and novice entrepreneurs might have a different (lower) preference for effectuation. Those assumptions lead in turn to the possibility that effectuation is likely a bundle of *learned* decision-making heuristics.

² Sarasvathy, in the quoted study, defines expert entrepreneur as “a person who, either individually or as part of a team, had founded one or more companies, remained a full-time founder/entrepreneur for 10 years or more, and participated in taking at least one company public” (Sarasvathy 2008 p. 21). While being very effective at capturing successful individuals, this definition does not control for luck, outside agency, or non-business related skill sets (c.f. politics) brought to bear upon business situations. This dissertation examines various entrepreneurs, very few of whom would qualify as expert under this definition.

Research Question

It has been widely reported in the research of Sarasvathy and colleagues that many expert entrepreneurs effectuate. In order to examine this possibility, and investigate the performance of those who use it, I posit the following research question: Do entrepreneurs who uses effectual logic outperform other entrepreneurs that do not use it? Specifically, if an entrepreneur shows a preference for using effectual logic, does his or her firm outperform other firms? And perhaps just as important, if an entrepreneur prefers to develop a business in an effectual manner is that entrepreneur more or less satisfied with his or her business?

Outline for Dissertation

Chapter two will briefly review effectuation, focusing first on its relationship to experience, and then to performance and satisfaction. I develop hypotheses detailing the positive relationships between experience and effectuation, as well as to effectuation's positive relationship with the entrepreneur's perception of performance. In addition, I develop hypotheses exploring a negative relationship between effectuation use and an entrepreneur's satisfaction with his or her business.

In Chapter three, I present a model of my hypotheses relating the relevant constructs to one another. I identify the constructs and variables of interest, define them, and explain their measurement. I then discuss the data collection and subsequent analysis of each hypothesis.

Chapter four presents the results of the study and analysis. Chapter five presents a discussion of the findings, conclusions, limitations, and directions for future research.

CHAPTER TWO - LITERATURE REVIEW

Effectuation, The theory

The word effectuation, and its root, effectuate, are derived from the Latin root *effectu-* meaning to bring about (The American Heritage dictionary of the English language, 2000). While ‘cause’ is subtly different from ‘bringing about’, the causal model of what entrepreneurs do is grossly different from the effectual model. Entrepreneurs who proceed causally often develop an entrepreneurial plan complete with environmental assessment, marketing research, financial preparations and a written business plan (Kuratko, 2008). Effectual entrepreneurs however, typically eschew these formal structures, and replace them with an alternative logic and set of behaviors as a basis for entrepreneurial action. In fact, Sarasvathy’s early work pitches effectuation as the opposite of causal (more traditional) reasoning (Sarasvathy, 2001). Specifically, she states that

Effectuation is the inverse of causation. Effectual reasoning is not merely a deviation from causal reasoning. It is a distinct mode of reasoning based on an entirely separate logic than the logic behind causal reasoning (Sarasvathy, 2001 p.5).

“Effectuation is a logic for practicing entrepreneurship as a method and studying it as a science of the artificial” (Sarasvathy, 2008 p.183). A logic is an internally consistent set of criteria that forms a clear basis for action upon the world (Sarasvathy, 200 a p.

183), whereas a ‘science of the artificial’, or artifactual³ science, is one that studies some subset of human artifacts (Sarasvathy, 2008 p. 153). The primary artifacts of interest in entrepreneurship are the entrepreneur and the firm.

Effectuation theory posits that expert entrepreneurs build their businesses in ways that are significantly different from the traditional business launch model. For example, as mentioned above, the entrepreneurial process taught at many universities is based on environmental assessment, marketing research, financial preparation, and developing a business plan (Kuratko, 2008), all of which is preceded by the discovery (Kirzner, 1997) or creation (Baker & Nelson, 2005; Gartner, 1985; Sarasvathy, Dew, Velamuri, & Venkataraman, 2003) of a viable business opportunity.

An effectual process however, tends to be iterative and non-determinative in nature, rather than linearly directed, towards a stated goal. Environmental assessment and marketing research may be ignored, financial preparation limited to deciding how much one can afford to lose, and the business plan delayed or subsumed altogether by an evolving business opportunity and an ever-changing cast of stakeholders.

This is not to say there is not a method to effectuation. Clearly it does have a method, or at least a set of procedures that are enacted to create and develop a business. Effectuation simply uses a different set of tools than does a traditional business start-up. Business plans, financial statements, market research and all the rest are traded for an alternate business launch paradigm.

³ Artifactual science is used in place of *artificial* science because of the alternate meaning of the word artificial.

Theoretically based, this paradigm consists of five principles, labeled the principles of entrepreneurial expertise (Sarasvathy, 2008 p. 15). These principles are bird-in-hand, affordable loss, crazy quilt, lemonade, and pilot-in-the-plane. *Bird-in-hand* refers to beginning with means already at one's disposal, and using those to create new effects. Using one's knowledge of the local area to start a tour business, or a taxi cab service is one example. *Affordable loss* is the concept of focusing on how much an entrepreneur can afford to lose when beginning a venture, rather than focusing on a more traditional ROI (return on investment) model. When an individual commits a certain amount of money, or a certain amount of time to a new business, with the understanding that if that commitment does not end in a successful business, then the individual will walk away, they are practicing the affordable loss principle. The *crazy quilt* principle emphasizes not only forming relationships with partners and other stakeholders, but also allowing those stakeholders to affect the form and substance of an entrepreneur's business. Finally, the *lemonade* principle focuses the entrepreneur on exploiting contingencies, rather than controlling for them and the *pilot-in-plane* principle focuses an entrepreneur on controlling whatever situations are under his control in order to make prediction unnecessary. These principles may be used individually, but are typically used in conjunction with each other. When exercised, these principles allow an entrepreneur some degree of control over a situation without having to predict a situation before hand. In her dissertation and subsequent research, Sarasvathy has found expert entrepreneurs rely upon these principles to start and grow their ventures.

These five principles are the current *theoretical* indicators of effectuation. Like most theories in the social sciences, effectuation has evolved over time. When

Sarasvathy first articulated the theory there were four principles. They were affordable loss, expanding partnerships, market definition, and customer definition (Sarasvathy, 1998). These principles were derived through verbal protocol analysis performed upon highly successful entrepreneurs working through a set of problems simulating business decisions at various points in the product life cycle from initial launch to exit.

However, these principles proved to be both theoretically and empirically quite fluid. In 2004 Sarasvathy, with Dew, made available a working paper that outlined the three principles of effectuation as affordable loss, pre-commitments, and a new one, contingent knowledge. This paper was eventually published in the *European Journal of Innovation Management* (Dew, Sarasvathy, Read, & Wiltbank, 2008). The next year, Read and Sarasvathy (2005), to strengthen the link between effectuation and expertise, developed a list of six key constructs (prediction, commitment, action, planning, risk, and attitude towards outside firms) that differentiated effectuation from more customary business start-up procedures. That same year Davidsson (2005), in a call for a process view of entrepreneurship, characterized effectuation as having four principles (affordable loss, strategic alliances, exploitation of contingencies and control of an unpredictable future). The next year Wiltbank et al. (2006) trimmed the list of effectuation principles to three (affordable loss, means driven, and leveraging consistencies). Finally, in 2008, Sarasvathy published Effectuation: Elements of Entrepreneurial Expertise, delineating the five theoretical principles mentioned earlier.

Just as effectuation theory has wandered a bit in its development, effectuation measures have been less than consistent. One attempt has been made to create empirical constructs that align with Sarasvathy's 2008 book (Kupper & Burkhardt, 2009). Other

than that, measurement of effectuation has been quite varied. One study (Politis, 2008) equates a preference for informal marketing and welcoming uncertain situations as proxies for effectuation. Another dichotomizes effectuation and causation, empirically if not theoretically placing them as polar opposites (Kupper & Burkhardt, 2009). It is difficult to criticize this lack of direction, both due to the amorphous nature of effectuation as an idea, and due to the lack of clarity in its theoretical delineation.

Although there has been little consistency, there has been quite a bit of research into effectuation. A thorough search of several resources and databases⁴ for effectuation limited to business, administration, finance, and economics journals returns almost twelve thousand hits. In sifting through them, I found around 150 articles that dealt directly with Sarasvathy's idea of effectuation. Most are theoretical in nature, but a few are empirical, if case study and protocol analyses are included. In the next section I summarize the empirical findings of effectuation research.

This emphasis on theory development is normal for new perspectives. The first research into effectuation was completed in 1998 (Sarasvathy, 1998), making the entire research stream only 13 years old. In that thirteen years, several general consensuses have emerged. Effectuation describes how *some* entrepreneurs start businesses. Scholars who study effectuation, and seem to be proponents of the efficacy of the process, assert that it is an *expert theory*. By that they mean that effectuation is practiced by, and seems to work for, highly successful entrepreneurs⁵. Finally, effectuation is a *business formation* process and *early stage* business phenomenon, becoming less useful as a

⁴ ABI/Inform, EBSCO, Google Scholar, ProQuest, ProQuest Digital Dissertation, SSCI

⁵ What highly successful is varies from study to study, but generally it involves starting one or more businesses that create a significant amount of wealth, and often go public.

business's position in the marketplace becomes more established. The reasoning behind this diminishing usefulness is that each binding decision made limits future opportunities to change a business's focus, direction, and/or scope, until a business is essentially locked into its niche by the accumulated limitations of previous decisions. Thus, the value of effectuation is limited by path-dependency. While these conclusions are (more or less) agreed upon, exactly what effectuation is (a process, a theory, a set of heuristics, etc.), what its individual components are, and how to measure it are still open questions in the literature. Below is a summary of what has been discovered in empirical examinations of effectuation.

Effectuation, Empirical findings

Effectuation has been a hotly debated theory, almost since its inception. One thing has been clear since the beginning, however. Whether labeled a theory, a set of behaviors, a bundle or heuristics, or any other name, the phenomenon in question existed. It was observable, first in Sarasvathy's entrepreneurs (Sarasvathy, 1998), and later in other research. In a recent case study, managers involved in internationalization were observed leveraging contingencies and embracing serendipity (Spence & Crick, 2006). In another, the entrepreneurs viewed uncertainty and ambiguity as resources that led to creativity and generated opportunity, and preferred committed partners over other partners better suited to their needs, in agreement with effectual principles (Tasic & Andreassi, 2008). Observation has not been limited to high performing entrepreneurs. Dew's dissertation (2003) chronicles the formation of the entire RFID market as a giant effectual process, fueled by commitments between individuals that shaped and limited how the market could form and develop. Finally, effectuation has been observed and measured in research and development departments (Kupper & Burkhardt, 2009), angel investors (Wiltbank, Sudek, & Read, 2009), and non-expert entrepreneurs (Mauer, Smit, Forster, & York, 2010).

These observations naturally led to the desire to measure effectuation. Because effectuation is a new theory, new measures needed to be constructed. Because effectuation is not very well understood, and thought to be a formative construct (Chandler, DeTienne, McKelvie, & Mumford, 2009), the scale development process has been troubled. Politis (2008) used an entrepreneur's preference for informal marketing methods and welcoming of uncertain situations as a proxy for effectuation. That same

year Forester and York (2008) combed the Panel Study of Entrepreneurial Dynamics (PSED) for questions that might demonstrate an effectual mindset to develop a post hoc measure of effectuation usable with the PSED's large, longitudinal data set. In that same spirit of looking for data on effectuation in the absence of theoretically derived, empirically verified measures, Read, Song, and Smit (2009) examined years of previous research to perform a meta-analysis of effectual principles. They discovered a positive relationship between effectual strategy making and new venture performance. Specifically, using given means, partnership, and leveraging contingencies were all positively associated with new venture performance, whereas there was no evidence of any correlation with affordable loss.

Recently more traditional means of developing scales have been employed. A scale based on the five logics of effectuation explicated in Sarasvathy's book (Sarasvathy, 2008) was constructed and validated (Kupper & Burkhardt, 2009), as was another scale, developed to measure causation, experimentation, affordable loss, flexibility, and pre-commitments (Chandler et al., 2009).

Being able to identify and measure effectuation has led to three primary empirical findings. First, the more experience an entrepreneur has, the more likely he or she is to effectuate. Second, effectuation leads to success. And third, most of the benefit of the effectuation process is derived from the flexibility associated with a new business, so effectuation's value in a business development context degrades over time.

Experience has been found to be positively associated with effectuation (Politis, 2008). That is not to say that all entrepreneurs, once they gain enough experience,

effectuate. It merely suggests that those entrepreneurs who *do* effectuate do so more as they gain more experience. Prior start up experience, as well as prior small business experience have been found to be positively associated with effectuating when starting a business (Gabrielsson & Politis, 2007), investing in a new business (Wiltbank et al., 2009), and when framing problems (Dew, Read, Sarasvathy, & Wiltbank, 2009b). Specifically, experienced entrepreneurs have been found to have a preference for attempting to control some aspects of the future instead of trying to predict it (Sarasvathy & Kotha, 2003; Sarasvathy, 2003), and marketing informally instead of using traditional business strategies (Politis, 2008). They also believe that businesses emerge from relationships (Jones & Holt, 2008), and use partners in making and changing business decisions (Read, Dew, Sarasvathy, Song, & Wiltbank, 2009), mirroring the crazy-quilt principle. Lastly, experienced entrepreneurs have been shown to base their decisions on what they can afford to lose instead of what they stand to gain (Read et al., 2009). This consideration affordable loss is the most consistent of all the effectual principles that have been put forward, appearing in virtually every piece of research on effectuation reviewed. This makes the non-finding of any connection between affordable loss and new venture performance (Read et al., 2009) especially interesting.

However, there have been many other findings that effectuation does somehow make things better. In the previously mentioned study, Read et al. (2009) found that focusing on means rather than ends, forming partnerships, and leveraging contingencies are all positively related to new venture performance. These findings were echoed by Forester & York (2008) who found non predictive strategies were significantly correlated with three separate measures of success in the PSED, and again when, with Mauer and Smit,

Forester and York (2010) demonstrated that affordable loss and partnerships led to enhanced value, but not acceleration of firm creation.

Effectuation seems to have value beyond new business creation. It is useful for mitigating Knightian uncertainty (Silberzahn & Midler, 2008) in a variety of contexts. Angel investors who reason effectually pick fewer failures than those who reason causally (Wiltbank et al., 2009). Research and development projects benefit from team members who effectuate (Kupper & Burkhardt, 2009). And as previously mentioned, effectuation led to the successful creation of the multi-billion dollar RFID market (Dew, 2003).

However, effectuation seems to have an expiration date. While portfolio entrepreneurs tend to use effectuation at the beginning stages of building their businesses, they switch to causation based logics as each business matures (Morrish, 2009). Not just maturity, but growth also leads to less effectuation (Laaksonen, Ainamo, & Karjalainen, 2010). Finally, the crazy-quilt constructed of relationships and pre-commitments leads to a sort of path dependency, and experimentation is replaced with planning (Brinckmann, Grichnik, & Kapsa, 2010). This is not the end of the business, it is the beginning. But it is the end of effectuation, for the moment.

Effectuation and Experience

The idea that skillfully enacted entrepreneurship is a learned ability is no longer seriously questioned. Through repeated engagement in business venturing, an entrepreneur may develop an entrepreneurial mindset (McGrath & MacMillan, 2000), or a knowledge set useful in launching new ventures. Some scholars assume that this knowledge can *only* be gained through direct observation or learning by doing (Minniti & Bygrave, 2001). Regardless of how it has been gained, entrepreneurial knowledge has been described as “a rarefied, abstract type of knowledge – the knowledge of where to obtain information (or other resources) and how to deploy it” (Kirzner, 1979, p. 8). A portion of this rarefied abstract knowledge could be knowledge of effectuation. Whether experience is the *only* way to learn effectuation is an open question, but it may be *one* way to learn it. Another way might be through just watching, as opposed to participating.

Direct Observation and Learning

Direct observation of others, watching the process unfold, and learning by doing are examples of gaining experience. Experience is the outcome of choices exercised, and results observed, and understood. It is this buildup of experience that develops in an entrepreneur the specific (entrepreneurial) mindset that prompts them to search for and select, in a disciplined manner, the best opportunity or course of action (McGrath & MacMillan, 2000). This process of learning by being in business allows entrepreneurs to learn from their successes as well as their failures (Minniti & Bygrave, 2001).

How then, does this work? The action of starting a firm leads to specific knowledge useful in future start-up opportunities (Ronstadt, 1988). In addition, ownership or management of, as well as employment in a new venture leads to relevant start-up experience (MacMillan, 1986; Ronstadt, 1988; Ucbasaran, Westhead, & Wright, 2006; Westhead & Wright, 1998). Entrepreneurs develop skills through the experience they gain in these start-ups, skills that become part of the unique resource set of the entrepreneur that informs future entrepreneurial decision-making (Westhead, Ucbasaran, & Wright, 2005).

Thus, this research presupposes that specific experience gained through participating in start-ups is useful in influencing future entrepreneurial outcomes. That is, applying specific knowledge, gained from previous specific entrepreneurial experience, may contribute to the success of a current endeavor (Minniti & Bygrave, 2001). This is not necessarily so in every endeavor. For example, one may be an experienced roulette player, having spent many hours engaged in the pastime. However, no decision made by a player matters- because it does not influence the outcome of a contest. Thus we have

no roulette colleges. If the same were true of entrepreneurship, we would likely have no entrepreneurship programs, and likely, no business programs at all.

Learning has been suggested to have happened, and intimated to affect performance, but what learning, and how? Learning-by-doing leads to certain promising actions being repeated, due to their past successes. Continued success reinforces this (Minniti & Bygrave, 2001). However entrepreneurial learning may or may not proceed towards a maximal payoff. Because of path dependency, any high payoff, even a suboptimal one, may bind (lock-in) an entrepreneur to a pattern of action (Minniti & Bygrave, 2001). This could be one part of the explanation of the variance in an entrepreneur's success. Once an entrepreneur finds something that works well, and satisfies his or her particular needs and wants (Simon, 1972), then he or she has learned to perform at a given level of success, and may not perceive the level of risk involved in deviation as being worth the potential reward available by following an alternate path (c.f. Kahneman & Tversky, 1979), or, may not even see alternate ways of proceeding any more. In finding a successful way forward the entrepreneur has conquered the start-up problems that bog down new ventures.

Start-Up Hazards

Because most new ventures share similar problems (Churchill & Lewis, 2000) (e.g. finding startup capital), the processes of coping with traditional start-up hazards must be part of any skill set developed while starting businesses. Some traditional start-up hazards are: liability of newness (Stinchcombe, 1965), liability of smallness (Freeman, Carroll, & Hannan, 1983), legitimacy (Aldrich & Fiol, 1994; Singh, Tucker, & House, 1986), Knightian uncertainty (Knight, 1921; Tversky & Kahneman, 1974), and in some cases, goal ambiguity (Dimaggio & Powell, 1983). Entrepreneurs develop skills, preferences and attitudes through involvement in business start-ups, which can be characterized as experientially acquired (Politis 2008). This experientially acquired learning seems to allow an entrepreneur to cope with traditional start-up hazards by first coping with past failure, (McGrath 1999; Shepherd 2003) and leveraging the informative nature of that failure (Minniti & Bygrave, 2001) to avoid future pitfalls (Minniti & Bygrave, 2001). Specifically, an entrepreneur utilizes his or her experience to develop skills that are useful in future start-ups (Starr and Bygrave 1991; Davidsson and Honig 2003). Startup experience could teach some entrepreneurs to effectuate. That is, they could learn, through the process of starting one or more businesses, to leverage unexpected events to their business's advantage, to form partnerships to further their business interests, and even to remain flexible regarding exactly what business they are in until late in the start-up process. It is likely that this is learned through the business start-up process because the level of effectuation an entrepreneur engages in has been found to be positively associated with start-up experience (Read, Wiltbank, & Sarasvathy, 2003). However, apart from the aforementioned study, there are no existing studies comparing

how novice and habitual entrepreneurs differ with regard to their preference for effectual decision-making (Politis, 2008).

Because learning happens while gaining experience, and because effectuation may be a learned logic, developed by an entrepreneur as a means of coping with the vagaries of start-up, I expect positive relationships between the entrepreneur's preference for the logics of effectuation and the amount of start-up experience a business owner possesses. Therefore, I hypothesize that:

H1: An entrepreneur's preference for the logics of effectuation is positively associated with start-up experience.

Effectuation Logics

Effectuation is an alternative to causation that some entrepreneurs use in the process of developing a new venture. It is composed of emergent, non-predictive⁶ (Wiltbank, Dew, Read, & Sarasvathy, 2006) strategies that are thought to mitigate the problems associated with operating under uncertain conditions (Wiltbank et al., 2006). Because each strategy, or logic as they are sometimes referred to, is distinct, each may react differently with experience.

⁶ Strategies that do not require predicting market reactions (esp. demand) to be effective

Experimentation

An entrepreneur approaching the market using effectual processes is likely to attempt, or at least contemplate, several business concepts or ideas before settling into a specific business (Sarasvathy, 2001). This search for fit could be characterized as innovative or experimental. Experimentation has been described as iterative trial and error, engaged in to develop a competitive advantage (Nicholls-Nixon, Cooper, & Woo, 2000). An advantage of experimentation is the ability to discard non-viable business options. The time and resources saved can be shifted to other projects, consistent with real options reasoning (McGrath, 1999). If experimentation is employed, the resultant time and resource savings are likely to be discovered while beginning a business, and then remembered for future business start-ups. Given the potential advantages associated with experimentation, and the lack of expected disadvantages I hypothesize that:

H1a: An entrepreneur's preference for experimentation is positively associated with startup experience.

Affordable Loss

The affordable loss logic has been the most stable tenet of effectuation, remaining unchanged from Sarasvathy's (1998) dissertation to present. The concept is typically loosely coupled with experimentation, and poses a limit on the amount of resources that an entrepreneur can afford to expend before giving up. It is considered an 'opposite' approach to determining the future value of an idea and basing investment decisions on that. When following the affordable loss logic, experimentation (and any other aspect of business development) stops when the loss limit is reached. It is important to note that this loss limit is not 'hard and fast', as would be the case with a fixed investment, but can change, given new information (entrepreneur's insight, business results, changing situation, etc.). Over time, an entrepreneur's ability to decide upon a reasonable affordable loss, or decide whether or not to modify his or her original decision and the ability to walk away once the loss point has been reached, are likely to improve especially if the entrepreneur is to be successful. In addition, the entrepreneur's belief in his ability to do this, thus positively reinforced, is likely to increase as well. Therefore, I hypothesize that an entrepreneur's preference for using affordable loss as a decision-making heuristic will be positively associated with his or her experience at starting companies.

H1b: An entrepreneur's preference for using the affordable loss heuristic is positively associated with experience.

Flexibility

Flexibility is one of the primary advantages a start-up firm holds over a more established firm (Ireland, Hitt, Camp, & Sexton, 2001; Saxenian & Hsu, 2001). From an effectual point of view, flexibility reduces the need for prediction, because expensive losses and unprofitable avenues of exploration can be abandoned at the first sign of loss without abandoning a business venture entirely (Sarasvathy, 1998). Flexibility, within an effectual framework, is allowing a business to develop in unexpected directions while avoiding courses of action that restrict future options. As an entrepreneur gains experience, he or she is more likely to have made decisions abandoning particular courses of action for other more profitable (or less unprofitable) courses of action, and learned from those decisions. Therefore, I hypothesize that:

H1c: An entrepreneur's preference for operating his firm in a flexible manner is positively associated with experience.

Pre-Commitments

The effectuation concept of expanding partnerships, often referred to as “crazy quilt”, (Sarasvathy, 1998) has developed over time into the logic of developing strategic alliances and pre-commitments from stakeholders in their potential or new businesses. Over time, entrepreneurs discover that these pre-commitments from stakeholders insulate him or her from future uncertainty by either implicitly or explicitly contracting it away. That is to say, as entrepreneurs gain experience, they learn that pre-commitments are a valuable form of insurance. Thus, pre-commitments are a mechanism for controlling the future in the absence of predicting it (Sarasvathy, 2001). Any logical examination of gaining pre-commitments from present and future stakeholders would lead one to believe that pre-commitments would be beneficial to an entrepreneur and to his or her venture, regardless of their overall use of effectuation. Therefore, regardless of the results of hypotheses 1a-c, I predict that:

H1d: An entrepreneur’s preference for using pre-commitments is positively associated with experience.

Effectuation, Performance, and Satisfaction

The proposed link between effectuation and performance is based on the finding that evidence for effectuation was first noticed by Sarasvathy (1998), in her sample of highly successful business people. It is for this reason that effectuation has heretofore been considered an ‘expert’ theory, and its application to non-expert entrepreneurs has been questioned. However, in the intervening years since Sarasvathy’s original study effectuation has been studied in novices (Dew, Read, Sarasvathy, & Wiltbank, 2009; Politis, 2008), in individuals engaged in research and development (Kupper, Aachen, & Burkhart, 2009), and in angel investors (Wiltbank et al., 2009), among other contexts. Further, research and even a textbook (Read et al., 2011) have been published to guide the teaching of effectuation as undergraduate level business subject matter. With this in mind, it is important to determine if there is some sort of relationship between using effectuation and a firm’s performance.

The current paradigm in entrepreneurship research equates the success of an entrepreneur with the success of a firm (Sarasvathy, 2008, p.123). If for no other reason than many businesses are successful at the time they are closed (Bates, 2005; Everett & Watson, 1998; Headd, 2003), the equating of *entrepreneurial* success with an *entrepreneur’s* success is oversimplified. Further, success and failure are not all-or-nothing propositions. Every business, no matter how successful, could be more successful simply by adding one of whatever metric that business is being judged by, whether it be dollars, share of market, or other success measure. For example, if we define success as profit, a lemonade stand making two dollars is twice as successful as one making one dollar. If we define it as glasses sold, a stand selling 10 glasses is more

successful than one selling nine. Similarly, if we define success as perception of success on a Likert scale, a business scoring 4.5 is half a point more successful than one scoring a 4. In most instances, the same would hold true for personal measures of success, such as satisfaction. It is for this reason I test how effectuation is related to the entrepreneur's perception of his or her firm's financial performance as well as his or her overall satisfaction with the business.

There is reason to believe that effectuation is positively related to firm performance. Effectuation was first noticed in individuals who ran very successful companies (Sarasvathy, 1998). Later, it was found that expert entrepreneurs⁷ utilize effectual logic by identifying more potential markets, focusing more on building the business as a whole, and paying less attention to predictive information than MBA students faced with the same challenges (Dew et al., 2009). These studies seem to indicate that individuals who use effectuation found and manage companies that do very well. For this reason I offer the hypothesis that effectuation and its individual components are positively related to firm performance.

H2: An entrepreneur's preference for effectuation is positively related to firm performance.

H2a: An entrepreneur's preference for experimentation is positively related to his or her perception of the firm's performance.

⁷ In this study expert was defined as founders of multiple companies with 15 years of experience and proven superior performance. Proven superior performance was undefined.

H2b: An entrepreneur's preference for using the affordable loss heuristic is positively related to his or her perception of the firm's performance.

H2c: An entrepreneur's preference for operating his firm in a flexible manner is positively related to his or her perception of the firm's performance.

H2d: An entrepreneur's preference for using pre-commitments is positively related to his or her perception of the firm's performance.

Further, even though satisfaction with performance and overall satisfaction with one's business are separate beliefs, it is reasonable to assume that they are related. It is likely that the more profitable a business is, the more likely the entrepreneur will be satisfied with it. So, if effectuation improves performance, then effectuation is also likely correlated with the entrepreneur's overall satisfaction with his or her business. However, effectuation takes some of the control of the business out of the entrepreneur's hands. This brief example demonstrates how effectual business practices function to limit choice and change a business's direction.

"A local independent businessperson owns a tile shop. Mainly to keep his two daughters busy and employed, he invests a thousand dollars in a used espresso maker, clears out a corner of the shop, and puts in a coffee and espresso shop. After a while business takes off, and because customers request it, baked goods are added along with a few tables. The addition of tables brings in still more business, increasing the need for space for the coffee shop. Simultaneous with the increase in business for the coffee shop, the demand for tile flooring diminishes due to recession. A decision is made to devote the entire storefront to the coffee shop, and add a lunch menu. The tile shop is then downsized into

a van, and without a retail presence, eventually stops getting business. At the end of the year, the company is reorganized as a restaurant, and the tile business is no more.” This example illustrates how the effectual principles of leveraging contingencies, focusing on ends-means relationships, experimentation, and affordable loss can work to push an entrepreneur into a completely unexpected business. Because of this, it is possible that people using effectuation are *less* satisfied with their business than individuals engaged in a more traditional start-up. Therefore, I offer the following hypotheses and sub-hypotheses.

H3: An entrepreneur’s preference for using effectuation is negatively related to entrepreneur’s satisfaction.

H3a: An entrepreneur’s preference for using experimentation is negatively related to his or her overall satisfaction with the business.

H3b: An entrepreneur’s preference for using the affordable loss heuristic is negatively related to his or her overall satisfaction with the business.

H3c: An entrepreneur’s preference for operating his firm in a flexible manner is negatively related to his or her overall satisfaction with the business.

H3d: An entrepreneur’s preference for using pre-commitments is negatively related to his or her overall satisfaction with the business.

CHAPTER THREE - METHOD

Effectuation has been studied ethnographically for some time. More recently, scholars have begun survey driven, empirical research in order to better define effectuation and place it within the broader entrepreneurship literature. The first attempt, by Politis, (2008) was conducted on a sample of 321 Swedish entrepreneurs starting a new firm in 2004. He attempted to measure habitual entrepreneurs' cognitive preference for effectual reasoning using four Likert-type items focusing on goal flexibility, informal marketing, ad hoc relationships with stakeholders, and welcoming uncertainty. Although this is the earliest survey driven research into effectuation I found, it is compelling as it tests the relationship between effectual proclivities and entrepreneurial experience rather than assuming it, and does not set causality up as a polar opposite to effectuation. Also in 2008, Forster & York (2008) presented a paper at the Babson Conference based on the Panel Study of Entrepreneurial Dynamics (PSED) to empirically examine the five theoretically derived principles of effectuation, using questions pulled from the PSED dataset. The next year at the same conference, (Wiltbank, Sudek et al. 2009) presented a paper containing a measure of prediction versus control, and came to the conclusion that early-stage investors valued control more than prediction. This categorizing of the survey items into predictive vs. control seems based on dichotomizing an investor's belief in his or her own predictive abilities vs. their belief in the competence of the venture team.

One more survey development paper needs to be mentioned here. It is published in the Journal of Business Venturing, (Chandler, DeTienne et al. 2009) and developed scales for causation, experimentation, affordable loss, flexibility, and pre-commitments. These scales have been rigorously developed, and are well accepted by effectuation scholars. It is this accepted set of scales that I used in this research to measure causation, effectuation and each of effectuation's logics. For a copy of the scale items, please refer to appendix one.

Sample

Because effectuation theory relates directly to decisions made primarily during the pre-firm and start-up phases of business development, finding individuals who have started a business was essential. Although not ideal, a convenient place to look for business founders is business owners, particularly owners of small businesses. Each business is individual, and starting any business is bound to be fraught with highly specific problems and decision-making opportunities. For this reason I selected business owners as my sample frame.

I utilized two sources to acquire the sample. The first source was business owners and managers who sought the help of the Small Business Institute at the University of Louisville within the last five years. The second source was business owners from the Midwest, interviewed, and encouraged to participate in a survey by students of business and entrepreneurship classes at another Midwestern university. Sampling is discussed in more detail under data collection.

Model

In chapter two I developed hypotheses relating start-up experience to effectuation, and effectuation, in turn, to both firm performance and the entrepreneur's satisfaction. Those hypotheses are represented graphically in figure one below. This is a set of causal hypotheses attempting to relate effectuation to its precursors and outcomes. Briefly, because the use of effectuation has been found (Sarasvathy, 2001) in some entrepreneurs without having been taught, but was not universal in nature (Sarasvathy, 2008), I hypothesized that effectual logics were learned (or discovered if you will) during the startup phase, leading to Hypotheses 1a through 1d. Then, based on the assumption that effectuation, because it is practiced by a sample of highly successful entrepreneurs is *good* for something, I developed hypotheses to test whether or not the thing that effectuation is good for is positively impacting firm performance. However, because effectuation processes narrow choices, I propose a negative relationship between effectuation and satisfaction.

- H1: An entrepreneur's preference for the logics of effectuation is positively associated with experience.
 - H1a: An entrepreneur's preference for experimentation is positively associated with experience.
 - H1b: An entrepreneur's preference for using the affordable loss heuristic is positively associated with experience.
 - H1c: An entrepreneur's preference for operating his firm in a flexible manner is positively associated with experience.
 - H1d: An entrepreneur's preference for using pre-commitments is positively associated with experience.

- H2: An entrepreneur's preference for effectuation is positively related to firm performance.
 - H2a: An entrepreneur's preference for experimentation is positively related to his or her perception of the firm's performance.
 - H2b: An entrepreneur's preference for using the affordable loss heuristic is positively related to his or her perception of the firm's performance.

- H2c: An entrepreneur's preference for operating his firm in a flexible manner is positively related to his or her perception of the firm's performance.
- H2d: An entrepreneur's preference for using pre-commitments is positively related to his or her perception of the firm's performance.
- H3: An entrepreneur's preference for effectuation is negatively related to entrepreneur's satisfaction.
 - H3a: An entrepreneur's preference for experimentation is negatively related to his or her overall satisfaction with the business.
 - H3b: An entrepreneur's preference for using the affordable loss heuristic is negatively related to his or her overall satisfaction with the business.
 - H3c: An entrepreneur's preference for operating his firm in a flexible manner is negatively related to his or her overall satisfaction with the business.
 - H3d: An entrepreneur's preference for using pre-commitments is negatively related to his or her overall satisfaction with the business.
 -

The general argument I test is that effectuation is learned through the start-up process, and it subsequently has a positive effect on firm performance and the entrepreneur's satisfaction with his or her business. In order to examine this argument, I first explain the constructs, and their parts, as shown above. Appendix 1 contains the survey instrument used for data collection required for this study and future research building on this dissertation. In the next several paragraphs I will discuss each aspect of this model, from left to right, followed by a brief discussion of included control variables.

Start-up Experience

Start-up experience is a count of the number of businesses the entrepreneur being surveyed has been involved with during the start-up phase. It has been found that highly successful entrepreneurs effectuate a great deal of the time (Sarasvathy 2008 p. 48). Research also shows that most effectuation within a business happens during the start-up phase (Morrish 2009). If these findings are true, then one explanation could be that entrepreneurs learn to effectuate by participating in start-up activities.

Effectuation

Effectuation is an alternative to causal reasoning, employed to mitigate the effects of Knightian uncertainty during the business formation process. What effectuation attempts to do is delay commitments to costly courses of action until such time as selecting a specific course of action brings with it heretofore unavailable resources. Or, at the very least, ends the commitment of resources to unprofitable or otherwise unacceptable ventures at predetermined levels. In order to measure the propensity to engage in such reasoning, I employ Chandler et al.'s (2009) four scales of effectuation processes. Those processes are experimentation, affordable loss, flexibility, and pre-commitments.

The scale for experimentation is a four-item scale based on Sarasvathy's definition of effectuation and modifications to Koberg, Detienne et al.'s (2003) innovation scale, taking into account the new venture context. Cronbach's α for the experimentation scale in Chandler et al.'s work was .78. I found an $\alpha = .64$ in my sample.

The scale for affordable loss is three items (original $\alpha = .85$, my $\alpha = .91$) and focuses quite directly on limiting financial risk.

The four item measure for flexibility (original $\alpha = .70$, my $\alpha = .78$) attempts to measure the willingness of the respondent to allow the direction of the business to be changed based on opportunity and resources, as well as the intent to act to maintain this adaptability.

Finally, the measure for pre-commitments (original $\alpha = .62$, my $\alpha = .78$) contains two items to determine to what extent agreements with other stakeholders were used to reduce uncertainty for the developing business.

The idea that effectuation is a bundle of heuristics or logics that together describe ways of thinking about and creating a business that do not necessarily correlate was proposed by Chandler (et al., 2011). This characterizes effectuation as a formative construct, allowing the researcher to retain theoretically relevant 'parts' of the construct, without the necessity of showing them to be related empirically. Interestingly, for a construct that is formative in nature, that is, made up of other constructs themselves formed of latent variables, if all items are included in a single calculation of the reliability coefficient the result is $\alpha = .74$.

Satisfaction with Firm Performance

In order to obtain a large, diverse sample of entrepreneurs, I sample individuals in many different lines of business. Because of differences in industries, any absolute measure of performance (gross sales, profit, retained earnings, etc.) would have a large amount of variation across industry lines, rendering it meaningless as an outcome variable. For this reason, I ask the respondent to “Please indicate how satisfied you are with your business’s financial performance – completely unsatisfied, mostly unsatisfied, partially unsatisfied, neither satisfied nor unsatisfied, partially satisfied, mostly satisfied, completely satisfied.”

Entrepreneur's overall satisfaction with his or her business

Entrepreneur's satisfaction is measured by the question "Please indicate how satisfied you are with your business overall – completely unsatisfied, mostly unsatisfied, partially unsatisfied, neither satisfied nor unsatisfied, partially satisfied, mostly satisfied, completely satisfied." This question, is designed to determine if effectuation's tendency to modify an entrepreneur's original business idea creates any resentment or discontent.

Control Variables

I include control variables to capture the demographic differences between individuals that might influence the entrepreneur's natural inclination towards causal or effectual logic. So far, no effectuation research has highlighted traditional demographic control variables, such as age, national origin, education, and gender as being relevant. However, other research into related topics such as entrepreneurship, learning, and thought processes has all found such variables of interest. For example, concerning gender, there are hundreds of articles and books relating gender to entrepreneurship (c. f. Bruni, Gherardi, & Poggio, 2005; Fischer, Reuber, & Dyke, 2003; Kourilsky & Walstad, 1998; Kuratko, Hornsby, & Naffziger, 1997; Minniti & Nardone, 2007). The research into gender and learning is even more prolific (c. f. Dweck, 1986; Epstein, Elwood, Hey, & Maw, 1998; Hayes & Flannery, 2000; Norton, 2000; Philbin, Meier, Huffman, & Boverie, 1995). Finally, the academic examination of gender and thought is nearly as munificent (c. f. Deaux & Major, 1987; Downing; Greenwald & Banaji, 1995; Markus & Kitayama, 1991). A similar story can be told for each of the above listed controls. I include them in this research not to explain away their importance, but simply to separate their possible impact on the use of effectual logic.

If effectuation is learned, then ruling out other sources of learning is essential to answering the question, "Is effectuation learned during start-up?" Formal and informal education (work experience) are both sources of learning. Thus education, both formal and informal, could influence beginning stores of knowledge. I attempt to capture this using two variables to assess education (general and specific to business) and one to measure work experience (years of employment). These variables are likely to impact the

dependent variables, so must be included. Further, of all the variables typically laundry listed as control variables, experience variables are indicated as theoretically relevant. Both the original sample that labeled entrepreneurs with a specific experience set as expert (Sarasvathy, 1998a), and later research (Politis, 2008; Read & Sarasvathy, 2005a) (see also many working papers, primarily by Menon & Sarasvathy) have indicated the importance of education and experience. Since it is highly likely that these variables will partially explain an individual's preference for effectuation, I felt it necessary to include them in any analysis conducted.

Data Collection

In order to determine if effectuation principles are learned through the start-up process it is necessary to find individuals who have engaged in one or more start-ups. Most, but not all business owners have started at least one business (some purchase ongoing concerns). With this in mind, I collected data from 471 business owners in two Midwestern cities. In city one, I personally called business owners who have used the resources of the local university's Small Business Institute. In the second city, students of several entrepreneurship classes distributed the research instrument to business owners. In the second city, follow-ups have been performed to ensure that actual business owners personally completed the instrument. The survey protocol is similar for each distribution. In city one I telephoned the potential recipient, obtain their email address, and sent them a link to the survey. If they hadn't completed the survey within a week, I sent the link again. If they still did not complete the survey, I called and made one last request that they complete the survey, and sent them the link. In city two, the students either followed the protocol I just described, or visited the business owner personally to observe the respondent completing the survey. In all cases, surveys were completed online, by the business owner. This restriction is in place to avoid methodological bias and errors due to input and/or transcription.

Data Analysis

The model depicted in Figure One contains 3 hypotheses with sub-hypotheses. They are separable into three groups. Hypotheses numbered one are directly concerned with the relationship between start-up experience and effectuation. Hypotheses numbered two are concerned with effectuation, and the entrepreneur's perception of firm performance. Hypotheses numbered three are concerned with effectuation and the entrepreneur's satisfaction with the specific business he or she is currently associated. The next several paragraphs discuss how I test each hypothesis. In order to control for the effect of luck on entrepreneurship, each statistical test was performed upon a subsample of repeat entrepreneurs as well as the entire sample.

Hypotheses 1a through 1d

The relationship between start-up experience and effectuation (H1, H1a-d)

These hypotheses are tested using Ordinary Least Squares (OLS) regression, the parameter estimate indicating the relative importance of each of the four measures of effectuation logics, and a t-score indicating significance. Because effectuation is thought to be a formative construct, it is not tested directly, but experience is regressed onto each of the four 'parts' of effectuation to determine whether each is related to experience, and how strongly.

- H1: An entrepreneur's preference for the logics of effectuation is positively associated with experience.
 - H1a: An entrepreneur's preference for experimentation is positively associated with experience.
 - H1b: An entrepreneur's preference for using the affordable loss heuristic is positively associated with experience.
 - H1c: An entrepreneur's preference for operating his firm in a flexible manner is positively associated with experience.
 - H1d: An entrepreneur's preference for using pre-commitments is positively associated with experience.

Hypotheses 2a through 2d

The relationship between effectuation and the entrepreneur's perception of firm performance (H2, H2a-d)

These hypotheses are tested using OLS regression, the parameter estimate indicating the relative importance of each of the four measures of effectuation logics, and a t-score indicating significance. Each of the four 'parts' of effectuation are regressed on the dependent variable of the entrepreneur's perception of performance to determine whether each is related, and how strongly.

- H2: An entrepreneur's preference for effectuation is positively related to firm performance.
 - H2a: An entrepreneur's preference for experimentation is positively related to his or her perception of the firm's performance.
 - H2b: An entrepreneur's preference for using the affordable loss heuristic is positively related to his or her perception of the firm's performance.
 - H2c: An entrepreneur's preference for operating his firm in a flexible manner is positively related to his or her perception of the firm's performance.
 - H2d: An entrepreneur's preference for using pre-commitments is positively related to his or her perception of the firm's performance.

Hypotheses 3a through 3d

The relationship between effectuation and the entrepreneur's satisfaction with his or her business (H3, H3a-d)

These hypotheses are tested using OLS regression, the parameter estimate indicating the relative importance of each of the four measures of effectuation logics, and a t-score indicating significance. Each of the four 'parts' of effectuation are regressed on the dependent variable of entrepreneur's satisfaction to determine whether each is related to the entrepreneur's perception of satisfaction, and how strongly.

- H3: An entrepreneur's preference for effectuation is negatively related to entrepreneur's satisfaction.
 - H3a: An entrepreneur's preference for experimentation is negatively related to his or her overall satisfaction with the business.
 - H3b: An entrepreneur's preference for using the affordable loss heuristic is negatively related to his or her overall satisfaction with the business.
 - H3c: An entrepreneur's preference for operating his firm in a flexible manner is negatively related to his or her overall satisfaction with the business.
 - H3d: An entrepreneur's preference for using pre-commitments is negatively related to his or her overall satisfaction with the business.

The next section presents and examines the results of the survey and subsequent analysis.

CHAPTER FOUR - RESULTS

Sample preparation and analysis

Of the 471 respondents, 450 completed all portions of the survey instrument I analyze herein. Respondents who did not complete the necessary portions of the survey were not significantly different from respondents as far as gender, education, experience or company size where provided, and represented less than 5% of the total cases so they were dropped from further analysis.

Of the 450 remaining respondents, 126 came from the University of Louisville sample, the remainder from the second sample. Respondents from each location were not statistically different on the above listed variables. Closest to significance was an experience variable, number of startups involved in, $p = .102$. Therefore, I analyze data as one sample.

Measures

Start Up Experience

Start-up experience is the count of the number of start-ups the subject has been involved with. It ranges from 0 to 24, with a mean of 1.4, and a standard deviation of 2.772.

Effectuation

Following Chandler et al. (2009), effectuation is a formative construct, comprised of the concepts (constructs) of experimentation, affordable loss, flexibility, and pre-commitments, with each being measured independently. Table One below reports the individual survey items making up each construct, their factor loadings in exploratory factor analysis (principal axis factoring, varimax rotation) and the composite item's reliability. Based on these results, composite measures were constructed by averaging the items for experimentation, affordable loss, flexibility and pre-commitments.

| Insert Table One About Here |

Satisfaction With Firm Performance

Satisfaction with firm performance was measured by asking the respondent to “Please indicate how satisfied you are with your business’s financial performance – completely unsatisfied, mostly unsatisfied, partially unsatisfied, neither satisfied nor unsatisfied, partially satisfied, mostly satisfied, completely satisfied” on a scale of one to seven (mean 4.93, standard deviation 1.64).

Entrepreneur's Overall Satisfaction with His or Her Business

Entrepreneur's satisfaction is measured by the question "Please indicate how satisfied you are with your business overall – completely unsatisfied, mostly unsatisfied, partially unsatisfied, neither satisfied nor unsatisfied, partially satisfied, mostly satisfied, completely satisfied" on a scale of one to seven (mean 5.40, standard deviation 1.476).

Control Variables

I captured various control variables in order to look for differences in adoption of effectuation and its effectiveness over race and gender, experience, business size, and education level. Table Two details control items collected, along with the above measures.

| Insert Table Two About Here |

Results

Means, standard deviations, reliabilities, and correlations between study variables are displayed in Table 3.

| Insert Table 3 About Here |

Hypothesis one and its sub-hypotheses assert that as some entrepreneurs gain more experience, they utilize effectual strategies more. Hypothesis two and its sub-hypotheses assert that the use of effectual logics improves the subject's perception of business performance. Hypothesis three and its sub-hypotheses assert that the use of effectual logics negatively impact the subject's perception of business performance. Summarized results of these hypotheses can be found in Table 4 below.

| Insert Table Four About Here |

Supported Hypotheses

I received support for four hypotheses, one related to experience and three related to the subject's perception of his or her business's financial performance. The largest adjusted R-square for a supported hypothesis was .009 indicating that the hypothesis with the strongest support explained less than 1% of the variance in overall business satisfaction.

Hypothesis related to experience

H_{1d}: An entrepreneur's preference for using pre-commitments is positively associated with experience ($EXP3 = b_0 + b_1p$). There is evidence to support that entrepreneurs who participate in multiple start-ups attempt to gain commitments from others that will aid in starting and growing their new business. Experience alone in this study accounts for less than 1% of this behavior.

Hypotheses related to perception of financial performance

H_{2a}: An entrepreneur's preference for experimentation is positively related to his or her perception of the firm's performance ($BIZFINPERF = b_0 + b_1x$). There is evidence to support the assertion that entrepreneurs who prefer to experiment believe their business performs better than the businesses of those who don't. This relationship explains less than 1% of the entrepreneur's perception of his or her business's performance.

H_{2b}: An entrepreneur's preference for using the affordable loss heuristic is positively related to his or her perception of the firm's performance ($BIZFINPERF = b_0 + b_1a$). There is evidence to support the assertion that entrepreneurs who think in terms of 'how much can I afford to lose in this business' rather than 'what rate of return could I anticipate' believe that their business performs better than the businesses of entrepreneurs who don't. This relationship explains less than 1% of the entrepreneur's perception of his or her business's performance.

H_{2c}: An entrepreneur's preference for operating his firm in a flexible manner is positively related to his or her perception of the firm's performance ($BIZFINPERF = b_0 + b_1f$). There is evidence to support the hypothesis that an entrepreneur who avoids locking himself into a set course of action and attempts to 'keep his options open' believes that his business outperforms the business of entrepreneurs who don't. This relationship explains less than 1% of the entrepreneur's perception of his or her business's performance.

Remaining hypotheses

The remaining hypotheses were found to be non-significant. Experimentation, affordable loss, and flexibility were found to be unrelated to the entrepreneur's experience. The use of pre-commitments was demonstrated to be unrelated to firm performance, and no effectuation heuristic was related to an entrepreneur's satisfaction with his or her business.

Summary of Results

While some support was found for effectuation being the result of experience, and for effectuation logics positively affecting an entrepreneur's perception of his or her financial performance, none was found indicating that the use of effectuation led to lower overall satisfaction. In fact, evidence was collected and analyzed that seemed to indicate that users of effectuation were more satisfied with their business than non-users. However, the effect sizes were so small that although there were several instance of statistical significance, I feel confident in declaring that according to this study, there is no practical significance of effectuation on any study variable.

CHAPTER FIVE - CONCLUSION

Discussion

Because effectuation has been cast in the literature as being practiced by successful and experienced entrepreneurs, I first tested the relationship between experience and effectuation. I hypothesized that if 'expert' entrepreneurs practiced effectuation (the unstated assumption was that novice entrepreneurs did not) then there should be a link between the amount of experience an entrepreneur had and to what degree he or she relied upon effectual logics. There was weak support for the hypothesis that a more experienced entrepreneur seeks pre-commitments from others in order to further their potential business opportunities. This could indicate that as entrepreneurs gain more experience in the market place they learn to seek out and obtain assurances from other stakeholders. These assurances might be tacit agreements, promises of support or non-competition, or other considerations, that when taken together, signal to the entrepreneur that the venture has merit beyond his or her own vision, and at least some level of support in the marketplace. These sorts of pre-commitments might serve to limit down side risk in a venture. Alternately, instead of searching for and obtaining pre-commitments, it could be that the pre-commitments are 'finding' the entrepreneur because of his or her past successes, and actually driving the business development process. This is not as far-fetched as it seems upon first consideration. A successful entrepreneur has proven to himself and the world around him that he is a capable person. If someone were in need of a new product or service and had no idea of how to create/develop/actualize it, a

reasonable place to lay the problem (and the resultant profit opportunity) is at the entrepreneur's feet. Once being made aware of the opportunity a natural next step for the entrepreneur might be to ask something like, "If I build it, will you come?". An affirmative answer is a pre-commitment.

Next, if effectuation is practiced by the highly successful, then it stands to reason that there might be a relationship between practicing effectuation and a business's financial performance. In testing this idea, I discovered two statistically significant relationships.

First, entrepreneurs who evaluate their business opportunities based upon what they can afford to lose perceive themselves to be more successful than those who do not. There are many possible explanations for this belief. First, in my sample they might actually be more successful than entrepreneurs approaching their business from a return on investment view. Second, limiting loss at the onset of a venture would be empowering to many potential entrepreneurs. Knowing the down-side risk, and knowing that they could survive it might give the entrepreneur the courage to act with speed and confidence, within his or her set loss parameters. Third, losing a set amount feels less like a failure than losing altogether. The entrepreneur who decides to risk \$5,000 in a venture and loses it all can view this particular loss as one in a string of wins and losses, and can in any event view sticking to his investment number as a personal success, even though the venture was not successful.

Second, entrepreneurs who remain flexible, putting off decisions, which limit future actions, are more successful than those who do not. This unsurprising finding, consistent with real options reasoning (McGrath, 1998; McGrath, 1999) demonstrates that

unnecessarily limiting a business venture's ability to act can limit that venture's success, or assist in its demise.

Finally, entrepreneurs who effectuate give up, to some extent, their selection of a specific business to be involved in, and the direction that their business takes. Further, it stands to reason that entrepreneurs who give up the choice of what business to be in might be less satisfied with their business than those who maintain their control of those choices. This idea has not been previously examined in the literature, but my line of reasoning led me to hypothesize that entrepreneurs who effectuate would be less satisfied overall with their businesses than those who did not. There was no evidence to support this hypothesis.

In summary, there is some support for hypotheses one and two, and no support for hypothesis three. Each significant hypothesis explains less than one percent of the total variance examined. Therefore, based upon the research design of this study and my data, effectuation is virtually unrelated to experience, business performance, or an entrepreneur's satisfaction with his or her business.

Conclusion

On the surface, the results provided by this study might be considered uninteresting. The lack of ‘proof’ for a highly cited theory could lead one to believe that the data are somehow flawed. However, upon closer examination, all of the ‘pieces’ of effectuation, the individual constructs predicted by Sarasvathy and operationalized by Chandler & DiTienne (2009) are present. The scales perform similarly in this data set to how they perform in other research. We have no trouble identifying the constructs that make up effectuation. However, most of the tested links to precursor and outcome variables were statistically insignificant, the rest, based on effect size, were meaningless.

But this lack of effect is in itself interesting. Some entrepreneurs effectuate. The phenomenon was first noticed in highly successful entrepreneurs, leading to the conclusion that the use of effectuation was positively associated with success. Further research indicates that entrepreneurs at various levels of success use effectuation. However, it appears to be virtually unrelated to performance. Undoubtedly there are many beliefs, skills and abilities, biases and heuristics, and even traits that entrepreneurs share that have little or nothing to do with their firm’s performance. Perhaps effectuation falls into that category. Further, there has been little research into effectuation outside the field of entrepreneurship. Perhaps effectuation is not so much an entrepreneurial phenomenon as a human one.

Most correlations, including this one, do not demonstrate causation. So perhaps, instead of examining and reexamining the highly successful entrepreneur to figure out what works best, we should examine the process of entrepreneurship itself, and seek improvements to performance there.

Limitations

This study is not without limitation. First, not all respondents were business owners. It is possible that being physically involved in a start-up is significantly different from being financially involved. It is possible that effectuation is an 'entrepreneurship specific' phenomenon. Perhaps having 'skin in the game' leads to more or less use of effectuation, and perhaps even to more or less of a correlation between effectuation and performance. This seems unlikely, because parallel theories such as bricolage (Baker & Nelson, 2005) and improvisation (Hmieleski & Corbett, 2006), which appear to embody similar behaviors and outcomes are not the exclusive domain of the entrepreneur.

Second, the survey was designed to capture effectuation use as an entrepreneur was participating in startup, while the performance was captured in the present time. This was done so that the use of effectuation would have temporal precedence over performance, lending credibility to the claim that the use of effectuation 'caused' positive performance. However, the length of time between the use of effectuation and the measure of performance was not constant. Some respondents were currently going through the business start-up process or had gone through it very recently, while others went through the start-up process several years ago. This gap leads to two potential problems. First, any effect upon performance of a start-up activity is bound to fade over time, making detection more difficult, the further away from the start-up date one measures. Second, the accuracy of information about the start-up fades, or is colored through recall bias as time goes on, limiting the accuracy of the effectuation measures used.

Third, because the data was collected exclusively through survey, common method variance was a potential issue (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Plans

were made for follow up interviews in order to assess whether or not the survey results accurately represented the experiences of the respondents, but because for all practical purposes there were no results, the follow-up interviews were not performed, and common method variance was not an issue.

Finally, as with most entrepreneurship research, only the successful are studied. Perhaps there is no difference on any measured variable and its relationship to performance among failed entrepreneurs. If that is the case, then this phenomenon, while interesting to study, is irrelevant to business performance.

Directions for Future Research

The results of this dissertation seem to indicate that perhaps enough research has been done into effectuation. But this is only one result. This study should be replicated, at a minimum. In addition, experiments could be designed to test effectuation's effectiveness versus a null model, and versus other theories of business creation. This would be especially useful and interesting if a sample of highly successful entrepreneurs who do not currently practice effectuation could be a part of any experimentation.

Aside from effectuation research, this dissertation has convinced me that continued study of and experimentation with the start-up process, with a vigilant eye for performance improvements, is the most valuable place I can spend my time.

REFERENCES

- Dictionary, American Heritage. "The American Heritage® Dictionary of the English Language."(2000).
- Abelson, Robert P. "Script processing in attitude formation and decision making." (1976).
- Aldrich, Howard E., and C. Marlene Fiol. "Fools rush in? The institutional context of industry creation." *Academy of management review* 19.4 (1994): 645-670.
- Baker, Ted, and Reed E. Nelson. "Creating something from nothing: Resource construction through entrepreneurial bricolage." *Administrative science quarterly* 50.3 (2005): 329-366.
- Barreto, Humberto. *The Entrepreneur in Microeconomic Theory*. London: Taylor & Francis Group, 2007.
- Bates, Timothy. "Analysis of young, small firms that have closed: delineating successful from unsuccessful closures." *Journal of Business Venturing* 20.3 (2005): 343-358.
- Brinckmann, Jan, Dietmar Grichnik, and Diana Kapsa. "Should entrepreneurs plan or just storm the castle? A meta-analysis on contextual factors impacting the business planning–performance relationship in small firms." *Journal of Business Venturing* 25.1 (2010): 24-40.
- Bruni, Attila. *Gender and entrepreneurship: An ethnographic approach*. Vol. 1. Routledge, 2005.
- Busenitz, Lowell W., and Jay B. Barney. "Differences between entrepreneurs and managers in large organizations: Biases and heuristics in strategic decision-making." *Journal of Business Venturing* 12.1 (1997): 9-30.
- Cantillon, Richard. *Essai sur la nature du commerce en général*. INEd, 1952.
- Chandler, Gaylen N., et al. "Causation and effectuation processes: A validation study." *Journal of Business Venturing* 26.3 (2011): 375-390.
- Davidsson, Per. "The entrepreneurial process as a matching problem." (2005).

- Deaux, Kay, and Brenda Major. "Putting gender into context: An interactive model of gender-related behavior." *Psychological review* 94.3 (1987): 369.
- Dew, Nicholas. "Lipsticks and Razorblades: how the auto ID center used pre-commitments to build the Internet of things." *Available at SSRN 964507* (2003).
- Dew, Nicholas, et al. "Effectual versus predictive logics in entrepreneurial decision-making: Differences between experts and novices." *Journal of Business Venturing* 24.4 (2009): 287-309.
- Dew, Nicholas, et al. "Immortal firms in mortal markets?: An entrepreneurial perspective on the "innovator's dilemma"." *European Journal of Innovation Management* 11.3 (2008): 313-329.
- DiMaggio, Paul J., and Walter W. Powell. "The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields." *American sociological review* (1983): 147-160.
- Downing, Kevin. "Gender and Cognition."
- Dunning, David, Chip Heath, and Jerry M. Suls. "Flawed self-assessment implications for health, education, and the workplace." *Psychological science in the public interest* 5.3 (2004): 69-106.
- Dweck, Carol S. "Motivational processes affecting learning." *American psychologist* 41.10 (1986): 1040.
- Eisenhardt, Kathleen M., and L. Jay Bourgeois III. "Politics of strategic decision making in high-velocity environments: Toward a midrange theory." *Academy of management journal* (1988): 737-770.
- Epstein, Debbie, et al. *Failing Boys? Issues in Gender and Achievement*. Taylor & Francis Inc., Orders and Customer Service, 7625 Empire Drive, Florence, KY 41042, 1998.
- Everett, Jim, and John Watson. "Small business failure and external risk factors." *Small Business Economics* 11.4 (1998): 371-390.
- Fiet, James O. *The systematic search for entrepreneurial discoveries*. Praeger Pub Text, 2002.
- Fischer, Eileen M., A. Rebecca Reuber, and Lorraine S. Dyke. "A theoretical overview and extension of research on sex, gender, and entrepreneurship." *Journal of Business Venturing* 8.2 (1993): 151-168.

- Forbes, Daniel P., and Frances J. Milliken. "Cognition and corporate governance: understanding boards of directors as strategic decision-making groups." *Academy of Management Review* 24.3 (1999): 489-505.
- Forster, W., and J. York. "The effects of effectual logic: Nascent entrepreneurial performance and effectuation." *Academy of Management Annual Meeting, Chicago*. 2009.
- Freeman, John, Glenn R. Carroll, and Michael T. Hannan. "The liability of newness: Age dependence in organizational death rates." *American sociological review* (1983): 692-710.
- Gabrielsson, Jonas, and Diamanto Politis. "5. Prediction or control? Exploring the influence of career experience and career motives on entrepreneurial decision making." *Entrepreneurship, Competitiveness and Local Development: Frontiers in European Entrepreneurship Research* (2007): 95.
- Gartner, William B. "A conceptual framework for describing the phenomenon of new venture creation." *Academy of management review* (1985): 696-706.
- Gompers, Paul, and Josh Lerner. *The venture capital cycle*. MIT press, 2004.
- Greenwald, Anthony G., and Mahzarin R. Banaji. "Implicit social cognition: attitudes, self-esteem, and stereotypes." *Psychological review* 102.1 (1995): 4.
- Hayes, Elisabeth, and Daniele D. Flannery. *Women as Learners: The Significance of Gender in Adult Learning. The Jossey-Bass Higher and Adult Education Series*. Jossey-Bass Inc., Publishers, 350 Sansome Street, San Francisco, CA 94104, 2000.
- Headd, Brian. "Redefining business success: Distinguishing between closure and failure." *Small Business Economics* 21.1 (2003): 51-61.
- Hébert, Robert F., and Albert N. Link. "In search of the meaning of entrepreneurship." *Small Business Economics* 1.1 (1989): 39-49.
- Hienert, Christoph. "The commercialization of user innovations: the development of the rodeo kayak industry." *R&D Management* 36.3 (2006): 273-294.
- Hmieleski, Keith M., and Andrew C. Corbett. "Proclivity for improvisation as a predictor of entrepreneurial intentions." *Journal of Small Business Management* 44.1 (2005): 45-63.
- Ireland, R. Duane, et al. "Integrating entrepreneurship and strategic management actions to create firm wealth." *The Academy of Management Executive (1993-2005)* (2001): 49-63.

- Jones, Oswald, and Robin Holt. "The creation and evolution of new business ventures: an activity theory perspective." *Journal of small business and enterprise development* 15.1 (2008): 51-73.
- Kahneman, Daniel, and Amos Tversky. "Prospect theory: An analysis of decision under risk." *Econometrica: Journal of the Econometric Society* (1979): 263-291.
- Kahneman, Daniel, Paul Slovic, and Amos Tversky, eds. *Judgment under uncertainty: Heuristics and biases*. Cambridge University Press, 1982.
- Kirzner, Israel M. *Perception, opportunity, and profit: Studies in the theory of entrepreneurship*. Chicago, IL: University of Chicago Press, 1983.
- Kirzner, Israel M. "Entrepreneurial discovery and the competitive market process: An Austrian approach." *Journal of economic Literature* 35.1 (1997): 60-85.
- Knight, Frank H. *Risk, uncertainty and profit*. Dover publications, 2006.
- Kourilsky, Marilyn L., and William B. Walstad. "Entrepreneurship and female youth: knowledge, attitudes, gender differences, and educational practices." *Journal of Business venturing* 13.1 (1998): 77-88.
- Küpper, Daniel, and Tina Burkhart. "Effectuation in the Context of R&D Projects: Characteristics and Impact on Project Performance." *Annual Meeting Proceeding*. 2009.
- Kuratko, Donald F. *Entrepreneurship: Theory, process, practice*. South-Western Pub, 2008.
- Kuratko, Donald F., Jeffrey S. Hornsby, and Douglas W. Naffziger. "An Examination of Owner's Goals in Sustaining Entrepreneurship." *Journal of Small Business Management* 35 (1997): 24-33.
- Laaksonen, Laura, Antti Ainamo, and Toni-Matti Karjalainen. "Entrepreneurial passion: an explorative case study of four metal music ventures." *Journal of Research in Marketing and Entrepreneurship* 13.1 (2011): 18-36.
- Lewis, Virginia L., and Neil Churchill. "The five stages of small business growth." *Harvard business review* 61.3 (1983): 30-50.
- Lyon, Douglas W., G. T. Lumpkin, and Gregory G. Dess. "Enhancing entrepreneurial orientation research: Operationalizing and measuring a key strategic decision making process." *Journal of Management* 26.5 (2000): 1055-1085.

- MacMillan, Ian C. *To really learn about entrepreneurship, let's study habitual entrepreneurs*. Wharton School of the University of Pennsylvania, Snider Entrepreneurial Center, 1986.
- Markus, Hazel R., and Shinobu Kitayama. "Culture and the self: Implications for cognition, emotion, and motivation." *Psychological Review* 98.2 (1991): 224.
- McGrath, Rita Gunther. "Falling forward: Real options reasoning and entrepreneurial failure." *Academy of Management Review* 24.1 (1999): 13-30.
- McGrath, Rita Gunther. "Only fools rush in? Using real options reasoning to inform the theory of technology strategy: Response to Gurud, Kumaraswamy, and Nayyar." *Academy of Management Review* 23.2 (1998): 214-216.
- McGrath, Rita Gunther, and Ian MacMillan. *The entrepreneurial mindset: Strategies for continuously creating opportunity in an age of uncertainty*. Vol. 284. Harvard Business Press, 2000.
- Miller, Danny. "The correlates of entrepreneurship in three types of firms." *Management science* 29.7 (1983): 770-791.
- Miller, Kent D. "Risk and rationality in entrepreneurial processes." *Strategic Entrepreneurship Journal* 1.1-2 (2007): 57-74.
- Minniti, Maria, and William Bygrave. "A dynamic model of entrepreneurial learning." *Entrepreneurship Theory and Practice* 25.3 (2001): 5-16.
- Minniti, Maria, and Carlo Nardone. "Being in someone else's shoes: the role of gender in nascent entrepreneurship." *Small Business Economics* 28.2 (2007): 223-238.
- Morrish, Sussie. "Portfolio entrepreneurs: an effectuation approach to multiple venture development." *Journal of Research in Marketing and Entrepreneurship* 11.1 (2009): 32-48.
- Nicholls-Nixon, Charlene L., Arnold C. Cooper, and Carolyn Y. Woo. "Strategic experimentation: Understanding change and performance in new ventures." *Journal of Business Venturing* 15.5 (2000): 493-521.
- Norton, Bonny. *Identity and language learning: Gender, ethnicity and educational change*. Allyn & Bacon, 2000.
- Philbin, Marge, et al. "A survey of gender and learning styles." *Sex Roles* 32.7 (1995): 485-494.

- Podsakoff, Philip M., et al. "Common method biases in behavioral research: a critical review of the literature and recommended remedies." *Journal of applied psychology* 88.5 (2003): 879.
- Politis, Diamanto. "Does prior start-up experience matter for entrepreneurs' learning?: A comparison between novice and habitual entrepreneurs." *Journal of small business and Enterprise Development* 15.3 (2008): 472-489.
- Read, Stuart, et al. "Marketing under uncertainty: The logic of an effectual approach." *Journal of Marketing* 73.3 (2009): 1-18.
- Read, Stuart, and Saras D. Sarasvathy. "Knowing What to Do and Doing What You Know." *The Journal of Private Equity* 9.1 (2005): 45-62.
- Read, S., Sarasvathy, S., Dew, N., Wiltbank, R., & Ohlsson. *Effectual Entrepreneurship*. Routledge. 2011.
- Read, Stuart, Michael Song, and Willem Smit. "A meta-analytic review of effectuation and venture performance." *Journal of Business Venturing* 24.6 (2009): 573-587.
- Read, S., R. Wiltbank, and S. D. Sarasvathy. "What do entrepreneurs really learn from experience? The difference between expert and novice entrepreneurs." *BKERC Proceedings* (2003).
- Ronstadt, Robert. "The corridor principle." *Journal of Business Venturing* 3.1 (1989): 31-40.
- Sarasvathy, Saras D. *How Do Firms Come to Be?: Towards a Theory of the Prefirm*. Diss. Carnegie Mellon University, 1998.
- Sarasvathy, Saras D. "Causation and effectuation: Toward a theoretical shift from economic inevitability to entrepreneurial contingency." *Academy of management Review* (2001): 243-263.
- Sarasvathy, Saras D. "Entrepreneurship as a science of the artificial." *Journal of Economic Psychology* 24.2 (2003): 203-220.
- Sarasvathy, Saras D., et al. "Three views of entrepreneurial opportunity." *Handbook of entrepreneurship research* (2005): 141-160.
- Sarasvathy, Saras D. *Effectuation: Elements of entrepreneurial expertise*. Edward Elgar Publishing, 2008.

- Sarasvathy, Sarah, and Suresh Kotha. "Effectuation in the management of Knightian Uncertainty: Evidence from the RealNetworks Case." *Effectuation in the management of knightian uncertainty: evidence from the realnetworks case* (2001).
- Saxenian, AnnaLee, and Jinn-Yuh Hsu. "The Silicon Valley–Hsinchu connection: technical communities and industrial upgrading." *Industrial and corporate change* 10.4 (2001): 893-920.
- Silberzahn, Philippe, and Christophe Midler. "Creating products in the absence of markets: A robust design approach." *Journal of Manufacturing Technology Management* 19.3 (2008): 407-420.
- Simon, Herbert A. "Theories of bounded rationality." *Decision and organization* 1 (1972): 161-176.
- Singh, Jitendra V., David J. Tucker, and Robert J. House. "Organizational legitimacy and the liability of newness." *Administrative Science Quarterly* (1986): 171-193.
- Spence, Martine, and Dave Crick. "A comparative investigation into the internationalisation of Canadian and UK high-tech SMEs." *International Marketing Review* 23.5 (2006): 524-548.
- Stinchcombe, Arthur L. "Social structure and organizations." (2000): 229-259.
- Tasic, Igor, and Tales Andreassi. "Strategy and Entrepreneurship: decision and Creation under uncertainty." *Journal of Operations and Supply Chain Management* 1.1 (2008): 12-23.
- Ucbasaran, Deniz, Paul Westhead, and Mike Wright. *Habitual entrepreneurs*. Edward Elgar Publishing, 2006.
- Utterback, James M. *Mastering the dynamics of innovation*. Harvard Business Press, 1996.
- Wally, Stefan, and J. Robert Baum. "Personal and structural determinants of the pace of strategic decision making." *Academy of Management Journal* (1994): 932-956.
- Westhead, Paul, Deniz Ucbasaran, and Mike Wright. "Decisions, Actions, and Performance: Do Novice, Serial, and Portfolio Entrepreneurs Differ?*" *Journal of small business management* 43.4 (2005): 393-417.
- Westhead, Paul, and Mike Wright. "Novice, portfolio, and serial founders: are they different?." *Journal of business venturing* 13.3 (1998): 173-204.

- Wiltbank, Robert, et al. "What to do next? The case for non-predictive strategy." *Strategic Management Journal* 27.10 (2006): 981-998.
- Wiltbank, Robert, Richard Sudek, and Stuart Read. "The role of prediction in new venture investing." *Frontiers of Entrepreneurship Research* 29.2 (2009): 3.
- Zacharakis, Andrew L., and G. Dale Meyer. "A lack of insight: do venture capitalists really understand their own decision process?." *Journal of business venturing* 13.1 (1998): 57-76.
- Zacharakis, Andrew L., and Dean A. Shepherd. "The nature of information and overconfidence on venture capitalists' decision making." *Journal of Business Venturing* 16.4 (2001): 311-332.

APPENDICES

Appendix 1: The Survey Instrument

Satisfaction

Satisfaction questions are preceded by the instruction “Please indicate how satisfied you are with the item on the left.” (the item on the left being the question) and aligned with seven column headers, left to right (Completely Unsatisfied, Mostly Unsatisfied, Partially Unsatisfied, Neither Satisfied no Unsatisfied, Partially Satisfied, Mostly Satisfied, Completely Satisfied). Questions within the business satisfaction section were presented in random order, along with two unused questions.

How satisfied are you with your company’s performance?

How content are you with the specific business you are in?

Effectuation

All of the effectuation questions are preceded by the instruction “Please indicate how much you agree or disagree with the statement on the left.” and aligned with seven column headers, left to right (Completely Disagree, Mostly Disagree, Somewhat Disagree, Neither Agree nor Disagree, Somewhat Agree, Mostly Agree, Completely Agree). All items are presented in random order within the overall effectuation section. Items are specifically not broken up by experimentation, affordable loss, etc.

Experimentation

We experimented with different products and/or business models

The product/service that we now provide is essentially the same as originally conceptualized (reverse coded)

The product/service that we now provide is substantially different than we first imagined

We tried a number of different approaches until we found a business model that worked

Affordable Loss

We were careful not to commit more resources than we could afford to lose

We were careful not to risk more money than we were willing to lose with our initial idea

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

We allowed the business to evolve as opportunities emerged

We adapted what we were doing to the resources we had

We were flexible and took advantage of opportunities as they arose

We avoided courses of action that restricted our flexibility and adaptability

Pre-commitments

We used a substantial number of agreements with customers, suppliers and other organizations and people to reduce the amount of uncertainty.

We used pre-commitments from customers and suppliers as often as possible

Experience

The experience question was asked directly as part of a question set relating to years in the labor force, work experience and other similar questions.

How many businesses have you started, or been with as they were starting?

Demographics

Several demographic variables were collected. Gender, race, level of education and level of business education were of primary interest to be used as control variables, had the results of the analysis necessitated it.

Figure One

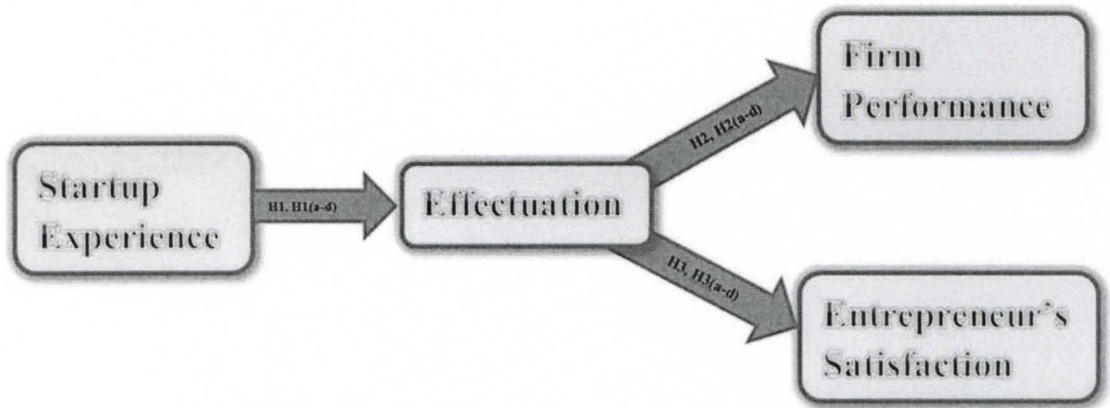


Table One

| Items | Construct | α | Factor 1 | Factor 2 | Factor 3 | Factor 4 |
|---|------------------|----------------------------|-----------------|-----------------|-----------------|-----------------|
| We experimented with different products and/or business models | Experimentation | .64 | .545 | | | |
| The product/service that we now provide is essentially the same as originally conceptualized | | | .723* | | | |
| The product/service that we now provide is substantially different than we first imagined | | | .802 | | | |
| We tried a number of different approaches until we found a business model that worked | | | .613 | | | |
| We were careful not to commit more resources than we could afford to lose | Affordable Loss | .91 | | .924 | | |
| We were careful not to risk more money than we were willing to lose with our initial idea | | | | .942 | | |
| We were careful not to risk so much money that the company would be in real trouble financially if things didn't work out | | | | .823 | | |
| We allowed the business to evolve as opportunities emerged | Flexibility | .78 | | | .705 | |
| We adapted what we were doing to the resources we had | | | | | .772 | |
| We were flexible and took advantage of opportunities as they arose | | | | | .830 | |
| We avoided courses of action that restricted our flexibility and adaptability | | | | | .695 | |
| We used a substantial number of agreements with customers, suppliers and | Pre-commitments | .78 | | | | .812 |

| | | | | | | |
|---|--|--|--|--|--|------|
| other organizations and people to reduce the amount of uncertainty | | | | | | |
| We used pre-commitments from customers and suppliers as often as possible | | | | | | .847 |

*reverse coded

Table Two

| Variable Label | Item Name | Item Description | Range | Mean | Standard Deviation |
|--------------------------|---|--|-----------------------|--------|--------------------|
| EXP3 | Startup Experience | Number of startups participated in | 0-24 | 1.4 | 2.772 |
| Effectuation | | | | | |
| X | Experimentation | Averages of the individual items detailed in table one | 1-7 | 3.9044 | 1.11381 |
| A | Affordable Loss | | 1.67-7 | 5.3207 | 1.40740 |
| F | Flexibility | | 3-7 | 5.8156 | .87299 |
| P | Pre-commitments | | 1.5-7 | 4.9967 | 1.42773 |
| BIZFINPERF | Satisfaction with my business's performance | 1-7 satisfaction scale | 1-7 | 4.93 | 1.640 |
| OVRLBIZSAT | Overall Satisfaction with my business | 1-7 satisfaction scale | 1-7 | 5.40 | 1.476 |
| Control Variables | | | | | |
| Experience | | | | | |
| EXP1 | Years with current company | Years with current company | 1-46 | 12.48 | 10.109 |
| EXP2 | Total Years of Employment | Total years of employment | 1-46 | 19.24 | 12.672 |
| EXP4 | Age | Subjects age | 20-64 | 42.99 | 12.110 |
| EXP5 | Business Education | Years of formal business education | 0-7 | 2.60 | 1.700 |
| EXP6 | Entrepreneurship Education | Yes/no to formal entrepreneurship education | Not applicable | | |
| Demographics | | | | | |
| DEMO1 | Gender | no answer, male, female, other | Not applicable | | |
| DEMO2 | Race | Drop down list of census recognized races | | | |
| DEMO3 | Education | Years of postsecondary education | 0-8 | 4.30 | 1.926 |

Table Three (Means, Standard Deviations, and statistical significances of survey variables)

| | Variable | M | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|----|------------|------|-------|--------|--------|--------|--------|---------|--------|--------|--------|--------|--------|--------|----|
| 1 | EXP3 | 1.4 | 2.77 | | | | | | | | | | | | |
| 2 | X | 3.9 | 1.11 | -.001 | (.64) | | | | | | | | | | |
| 3 | A | 5.3 | 1.41 | .058 | -.001 | (.91) | | | | | | | | | |
| 4 | F | 5.8 | .87 | .082 | -.005 | .365** | (.78) | | | | | | | | |
| 5 | P | 4.9 | 1.43 | .094* | .252** | .193** | .272** | (.78) | | | | | | | |
| 6 | BIZFINPERF | 4.9 | 1.64 | .045 | .094* | .107* | .102* | .047 | | | | | | | |
| 7 | OVRLBIZSAT | 5.4 | 1.47 | .105* | .030 | .125** | .133** | -.050 | .830** | | | | | | |
| 8 | EXP1 | 12.4 | 10.10 | .247** | -.019 | -.051 | .040 | -.091 | .188** | .083 | | | | | |
| 9 | EXP2 | 19.2 | 12.67 | .104* | -.043 | .006 | .023 | -.076 | .168** | .158** | .659** | | | | |
| 10 | EXP4 | 42.9 | 12.11 | .131** | -.004 | .029 | .072 | -.151** | .257** | .260** | .630** | .791** | | | |
| 11 | EXP5 | 2.60 | 1.70 | -.002 | -.006 | -.041 | -.119 | -.046 | .038 | .033 | -.004 | -.014 | .094* | | |
| 12 | DEMOS | 4.30 | 1.93 | .035 | .069 | .047 | -.044 | .032 | -.008 | -.003 | -.043 | .037 | .127** | .522** | |

*p < .05, **p < .01

Note: Cronbach's alphas are displayed in parentheses on the diagonal

Table Four

| | H₁ | H₂ | H₃ |
|----------------|-----------------------|--------------------------------|-----------------------------|
| | Experience | Business Financial Performance | Entrepreneur's satisfaction |
| | EXP3 | BIZFINPERF | OVRLBIZSAT |
| X | H_{1a} | H_{2a} | H_{3a} |
| B | -.002 | .139* | .040 |
| Std. Err. | .119 | .069 | .063 |
| Beta | -.001 | .094* | .030 |
| R-squared | .000 | .009 | .001 |
| Adj. R-squared | -.002 | .007 | -.001 |
| A | H_{1b} | H_{2b} | H_{3b} |
| B | .116 | .125* | .131** |
| Std. Err. | .094 | .055 | .049 |
| Beta | .058 | .107* | .125 |
| R-squared | .003 | .011 | .016 |
| Adj. R-squared | .001 | .009 | .013 |
| F | H_{1c} | H_{2c} | H_{3c} |
| B | .261 | .191* | .224** |
| Std. Err. | .151 | .088 | .079 |
| Beta | .082 | .102* | .133 |
| R-squared | .007 | .010 | .133 |
| Adj. R-squared | .004 | .008 | .015 |
| P | H_{1d} | H_{2d} | H_{3d} |
| B | .185* | .055 | -.051 |
| Std. Err. | .092 | .054 | .049 |
| Beta | .094* | .047 | -.050 |
| R-squared | .009 | .002 | .002 |
| Adj. R-squared | .007 | .000 | .000 |

* p = .05, ** p = .01

CURRICULUM VITAE

NAME: Thomas E. Nelson

ADDRESS: West Virginia State University
102 Hill Hall
P. O. Box 1000
Institute, WV 25112-1000

DOB: Muncie, IN – April 16, 1971

EDUCATION: B.S., Entrepreneurship
Ball State University
July 2005

M.B.A. Entrepreneurship
Ball State University
July 2006

Ph. D., Entrepreneurship
University of Louisville
2006-2012

PROFESSIONAL SOCIETIES:

Academy of Management

- Entrepreneurship Division
- Business Policy and Strategy Division
- International Management Division
- Research Methods Division
- Management, Spirituality and Religion Interest Group

Collegiate Entrepreneurship Organization
International Network for Social Network Analysis
Strategic Management Society
United States Association for Small Business and Entrepreneurship
Beta Gamma Sigma
Phi Kappa Phi
Delta Sigma Pi

PUBLICATIONS:

NATIONAL MEETING PRESENTATIONS

“Publicly Traded Venture Capital: Malfeasance, Misfeasance, and Nonfeasance” (By Thomas E. Nelson) Presented at the Association of Private Enterprise Education annual meeting, April 2012

“Entrepreneurial Design: A Design-Based Theory of Entrepreneurship” (By Michael Goldsby and Thomas E. Nelson) Accepted for presentation at USASBE’s Annual Meeting 2011 in New Orleans, LA

“A Five Logics Based Scale for Effectuation” (By Thomas E. Nelson and Michael Goldsby) Presented at Babson’s Annual Conference 2011 Syracuse University, Rochester NY.

“Entrepreneurs and Institutions: Three Institutional Factors and their Effects” (By Michael D. Crum and Thomas E. Nelson) Presented at USASBE’s Annual Meeting 2010 Hilton Head NC.

“A Cognitive View of Strategic Behavior” (By Robert Sinclair and Thomas E. Nelson) Presented at SMS Annual Meeting 2009 Washington DC.

“A Co-Authorship Analysis of Entrepreneurship Literature” (By Thomas E. Nelson) Presented at the Strategic Management Society’s annual meeting October, 2008 In Cologne Germany.

“The Effects of Antecedents of Entrepreneurial Expectancy on Effort and Startup” (By Betty Conklin and Thomas E. Nelson) Presented at the Academy of Management at the August 2008 Meetings in Anaheim CA.

“The Potential Danger of Public Venture Capital Companies: An Agency Risk Perspective” (By Thomas E. Nelson) Presented at the Academy of Management at the August 2008 Meetings in Anaheim CA.

REFEREED JOURNALS

Goldsby, M.G. & Nelson, T.E. (2012). Entrepreneurial Design: A Design Based Theory of Entrepreneurship. *Journal of Business & Entrepreneurship* Vol. 23, #2 Winter, pgs 80-95.

Nelson, Thomas E. (2006) Book review of “Startups That Work,” by Joel Kurzman and Glen Rifkin. *Journal of Small Business Strategy*, 17(2): 105-108