

# ENTREPRENEURIAL HEURISTICS AND SERIAL ENTREPRENEURS

---

A Dissertation  
Submitted  
to the Temple University Graduate Board

---

In Partial Fulfillment  
of the Requirements for the Degree of  
Doctor of Philosophy

---

By  
David E. Barsky  
January, 2010

Dissertation Examining Committee

Robert D. Hamilton III, Major Advisor, General and Strategic Management

Shreeram Mudambi, General and Strategic Management

Patrick Maggitti, General and Strategic Management

Robert Giacalone, Human Resource Management

©

Copyright

2010

by

David E. Barsky

## **ABSTRACT**

### Entrepreneurial Heuristics and Serial Entrepreneurs

David E. Barsky

Doctor of Philosophy

Temple University, 2010

Robert Hamilton III

This dissertation is comprised of three separate entrepreneurship papers.

Paper 1, “Entrepreneurial Heuristics...”, found that being mentored, rather than either having extensive higher education or more work experience, was primarily responsible for entrepreneurs acquiring the simplified decision rules (heuristics) that can be useful to them in their business pursuits. The study also found that entrepreneurs do not seem to switch their decision making processes from a “rational man” (thorough) mode to a more abbreviated, heuristic mode as some current thinking suggests. Also in Paper 1 this researcher presented and utilized a 27 item heuristics scale which was used to identify “use of heuristics” by the entrepreneurs studied.

Paper 2, “Female Serial Entrepreneurs...”, examined the characteristics of female serial entrepreneurs (SE’s) as a group of growing size and importance. Three areas- business size, hours worked in the business, and amount and type of capital raised- were explored through contrasting female SE’s with female non-SE’s and male SE’s. The primary findings were as follows: the businesses of female SE’s are larger than those of female non-SE’s, and female SE’s in the professional, technical and scientific services industry borrow more debt than female SE’s in this industry, but they do not work longer hours than female non-SE’s. It was also found that female SE businesses, in the

industries examined in the study, have come to rival male SE businesses in size, as measured in revenues.

Paper 3, “The Serial Entrepreneur Dilemma...”, explained a conundrum: why serial entrepreneurs do not outperform novice entrepreneurs. A literature review is given consisting of the scholarly thinking about the causes of the conundrum, and then three hypotheses are tested to explore the dilemma. Looking at serial entrepreneurs and novices over time, rather than cross-sectionally, helps to explain the conundrum: the SE’s are willing to take losses early on (thus not performing higher than the novices) in expectation of future profits. It was also found that in slow-moving industries, serial entrepreneurs performed much better than novice entrepreneurs in revenues, whereas in fast-moving industries the difference between the two groups in performance was negligible.

## ACKNOWLEDGMENTS

I would like to acknowledge with gratitude the help of the following people and institutions during my work on this doctoral dissertation:

Dr. Robert Hamilton III, my dissertation chair, who patiently read and advised on so many drafts of my papers, and who has been very supportive in a variety of ways all throughout my time as a PhD student at Temple University;

The rest of my dissertation committee-Dr. Ram Mudambi, Dr. Patrick Maggitti, and Dr. Robert Giacalone-for their helpful criticisms;

My mother, Sylvia Barsky Barol, who provided me with the “stick-to-itiveness” to finish the job, and was always there during the dissertation process with encouragement and help;

Ying Wang, my sweetheart, who brightened my life during the hard and sometimes lonely dissertation process;

Barbara K., whose advice was indispensable;

Alan Gruenberg, whose advice and guidance was so helpful throughout;

The Ewing Marion Kauffman Foundation, for providing me access to the data which I used in two of the research papers in this dissertation;

And more generally, to the many nice people, including members of the faculty and administration, and my fellow students, I have had the pleasure to meet and learn with throughout my time at the Temple PhD program.

## **DEDICATION**

I dedicate this doctoral dissertation to my mother, Sylvia Barsky Barol,  
for all the help and love she has shown me  
throughout this dissertation process and throughout my life.

# TABLE OF CONTENTS

	Page
ABSTRACT .....	iii
ACKNOWLEDGMENTS .....	v
DEDICATION .....	vi
LIST OF TABLES .....	viii
INTRODUCTION .....	xii
 CHAPTER	
1. RESEARCH STUDY 1- ENTREPRENEURIAL HEURISTICS: INFLUENCES ON ENTREPRENEURIAL USE AND SUCCESS .....	1
2. RESEARCH STUDY 2- A STUDY OF THE FEMALE SERIAL ENTREPRENEUR IN THE UNITED STATES .....	41
3. RESEARCH STUDY 3- THE SERIAL ENTREPRENEUR DILEMMA .....	74
 CONCLUSION.....	 109
REFERENCES CITED.....	112

## LIST OF TABLES

	Page
<b>CHAPTER 1 / STUDY 1</b>	
Table 1. Questionnaire Items .....	20
Table 2. Rotated Component Matrix Using 27 Entrepreneurial Heuristics Items.....	21
Table 3. Means, Standard Deviations and Correlations of Key Variables .....	26
Table 4. Key Variables’ Relationships to the Dimensions of Entrepreneurial Heuristics .....	29
Table 5. The Relationship Between Heuristics Use and Success in a Quickly Moving Environment .....	31
<b>CHAPTER 2 / STUDY 2</b>	
Table 6. Frequency Table for Selected Variables, KFS Participants.....	58
Table 7. Mean and Sum of Ranks for Hours Worked Per Week by Group.....	59
Table 8. Mann-Whitney for Hours Worked Per Week by Group, Female Non-Serial Entrepreneur/Female Serial Entrepreneur .....	59
Table 9. Mean & Sum of Ranks for Hours Worked Per Week By Group.....	60
Table 10. Mann-Whitney for Hours Worked Per Week by Group, Male Serial Entrepreneur vs. Female Serial Entrepreneur.....	60
Table 11. Mean and Sum of Ranks For H2a, Total Debt Investments Solicited, NAICS Industry Code 54- Professional, Scientific and Technical Services .....	62
Table 12. Mann-Whitney for Hypothesis 2a, Debt Invested by Female SE/Non-SE, NAICS Industry Code 54.....	62
Table 13. Mean & Sum of Ranks for H2a, Total Debt Solicited, NAICS Industry Code 33- Manufacturing Businesses .....	62
Table 14. Mann-Whitney for H2, Debt Invested by Gender .....	62
Table 15. Mean and Sum of Ranks for H2a, Total Equity Investments Solicited, NAICS Codes 54.....	63

Table 16. Mann-Whitney for Hypothesis 2a, Equity Invested, Female SE/non-SE.....	63
Table 17. Mean and Sum of Ranks for Hypothesis 2a, Total Equity Investments Solicited, NAICS Code 33- Manufacturing.....	63
Table 18. Mann-Whitney for Hypothesis 2a, Equity Invested, Female SE/non-SE, NAICS Code 33- Manufacturing.....	63
Table 19. Mean & Sum of Ranks for H2b, Debt Borrowed by Entrepreneur Type NAICS Code 54 and Associated Mann-Whitney Statistics.....	64
Table 20. Mann-Whitney for Hypothesis 2b, Debt Utilized by Entrepreneur Type .....	65
Table 21. Mean and Sum of Ranks for H2b, Debt Borrowed by Entrepreneur Type, NAICS Code 33 Businesses (Manufacturing Businesses).....	65
Table 22. Mann-Whitney for Hypothesis 2b, Debt Utilized by Entrepreneur Type, NAICS Code 33 Businesses.....	65
Table 23. Mean and Sum of Ranks for Hypothesis 2b, Equity Raised by Entrepreneur Type, Businesses in NAICS Code 54 (Professional, Scientific and Technical Services).....	65
Table 24. Mann-Whitney for Hypothesis 2b, Equity Raised by Entrepreneur Type, NAICS Code 54.....	65
Table 25. Mean & Sum of Ranks for Hypothesis 2b, Equity Raised by Entrepreneur Type, Businesses in NAICS Code 33 (Manufacturing Businesses) .....	66
Table 26. Mann-Whitney for Hypothesis 2b, Mean and Sum of Ranks for Hypothesis 2b, Equity Raised by Entrepreneur Type, NAICS Code 33 .....	66
Table 27. Mean and Sum of Ranks for Business Size, Female SE vs. Female Non-SE, NAICS Codes 54 (scientific, professional and technical services.....	67
Table 28. Mann-Whitney for Business Size, Female SE vs. Female non-SE, NAICS code 54.....	67
Table 29. Mean and Sum of Ranks for Business Size, Female SE vs. Female non-SE, NAICS code 33 (manufacturing businesses) .....	67
Table 30. Mann-Whitney for Business Size, Female SE vs. Female non-SE, NAICS code 33 .....	68

Table 31. Mean and Sum of Ranks for Business Size, Male SE vs. Female SE, NAICS Industry Codes 54 .....	69
Table 32. Mann-Whitney for Business Size, Male SE vs. Female SE, NAICS code 54 .....	69
Table 33. Mean and Sum of Ranks for Business Size, Male SE vs. Female SE, NAICS code 33 .....	69
Table 34. Mann-Whitney for Business Size, Male SE vs. Female SE, NAICS code 33 .....	69
<b>CHAPTER 3 / STUDY 3</b>	
Table 35. Studies and Reviews that Discuss the Failure to Show a Difference Between Experienced and Novice Entrepreneurs in the Area of Business Performance .....	75
Table 36. Descriptive Statistics for KFS Participants.....	95
Table 37. Mean & Sum of Ranks for Entrepreneur Groups Posting Business Losses .....	96
Table 38. Mann-Whitney for Business Losses .....	96
Table 39. Mean & Sum of Ranks for Business Profits .....	97
Table 40. Mann-Whitney for Business Profits .....	97
Table 41. Mean & Sum of Ranks for Business Revenues .....	98
Table 42. Mann-Whitney for Business Revenues to Establish Serial Entrepreneur Dilemma.....	98
Table 43. Means & Standard Deviations of Number of Employees by Group .....	99
Table 44. Independent Samples t-test on Number of Employees by Group .....	99
Table 45. Mean and Sum of Ranks for Fast Moving Environment/High Tech Businesses.....	101
Table 46. Mann-Whitney for Fast Moving Environments.....	101
Table 47. Mean & Sum of Ranks for Slow Moving Environment /Lower Tech Businesses .....	101

Table 48. Mann-Whitney for Hypothesis 1, Slow Moving Environments/Low Tech Businesses .....	101
Table 49. Mean and Sum of Ranks for Hypothesis 2, Hours Worked by Group .....	101
Table 50. Mann-Whitney for Hypothesis 2, Hours Worked by Group .....	102
Table 51. Mean and Sum of Ranks for Hypothesis 2, Amount of Money Owner Invested in the Business.....	102
Table 52. Mann-Whitney for Hypothesis 2, Amount of Money Owner Invested in the Business.....	102
Table 53. Mean & Sum of Ranks for Revenues of Serial Entrepreneurs Starting Businesses in Same and Different Industries (Hypothesis 3b).....	103
Table 54. Mann-Whitney for Hypothesis 3b .....	103
Table 55. Mean & Sum of Ranks for Profit by Entrepreneurial Group, Third Followup Year of the KFS .....	105
Table 56. Mann-Whitney for Profit by Entrepreneur Group, Third Followup Year of KFS .....	105

## INTRODUCTION

This dissertation is comprised of three separate papers. The papers are entitled: “Entrepreneurial Heuristics: Influences on Entrepreneurial Use and Success” (referred to hereafter in this introduction as paper 1); “A Study of the Female Serial Entrepreneur in the United States” (paper 2); and “The Serial Entrepreneur Dilemma” (paper 3). These three papers, at the most basic level, share the common aspect of being related to cutting-edge themes in entrepreneurship.

This dissertation should be of special interest to researchers or professionals interested in entrepreneurial cognition, in serial entrepreneurship, and theory and public policy related to entrepreneurship more generally. This researcher believes that these three dissertation papers are rich in new insights about cognition and serial entrepreneurship.

While these three papers were not written with the intent of them sharing similar themes, reflection on the theory and results of these papers suggests that they do in fact share certain similarities and differences.

Regarding similarities, for instance, both Paper 1 and Paper 3 reveal interesting findings about the effects of a fast-moving business environment on entrepreneurs and their businesses. Paper 1’s findings, which run contrary to some of the arguments expressed in the current literature, suggest that a fast moving entrepreneurial environment does not lead entrepreneurs to switch their decision making processes from a more thorough, “rational man” style mode to a more heuristic mode of thinking. Paper 3’s results suggest that serial entrepreneurs are more able to learn from their experiences in a

slow moving, rather than a fast moving, environment; and in such a slow moving environment serial entrepreneurs can outperform novice entrepreneurs significantly.

Another similarity in these papers is that they offer new insights into entrepreneurial learning. Paper 1's results suggest that heuristics (defined as rules of thumb and simplified decision making rules used to make business decisions) are best acquired by entrepreneurs from a mentor-protégé relationship rather than from business experience of various kinds, or even from more formal business education. Paper 3's findings suggest that entrepreneurial learning is best achieved in slow-moving industries such as the furniture industry, rather than a quicker paced environment such as the microcomputer environment. Indeed, the results for Paper 3 suggest that serial entrepreneurs do not outperform novice entrepreneurs in fast moving environments, possibly because the quickness of the business environment makes it difficult to see the consequences of particular actions and thus learn from them.

While these papers reflect similarities, there are also important differences between them. Paper 1 uses a small data set gathered by this researcher solely for the purpose of the paper. Papers 2 and 3, on the other hand, utilize a large scale data set known as the Kauffman Firm Survey (K.F.S.), which included longitudinal data on 4,928 entrepreneurs and their businesses. The size of this data set allows for greater numbers of sub-populations such as female serial entrepreneurs, allowing for the first time (to the best knowledge of this researcher) this group to be statistically studied.

A second distinction that can be made between the papers is that Papers 1 and 2 seem to offer more insights for public policy and practice than Paper 3, which is more of a contribution towards pure theory of serial entrepreneurship. Of course, it can be

difficult to forecast the degree to which a theoretical contribution can impact policy and practice over time.

## **CHAPTER 1**

### **STUDY 1**

#### **ENTREPRENEURIAL HEURISTICS: INFLUENCES ON ENTREPRENEURIAL USE AND SUCCESS**

While growing attention has recently been focused on entrepreneurs' cognitive processes (Baron & Ward, 2004; Mitchell, et al., 2007), the role of heuristics in entrepreneurial thinking has been underappreciated. While the term "heuristics" has multiple meanings in different contexts, this paper follows the management usage of the term heuristics introduced by Manimala (1992), who defined heuristics as rules of thumb or overarching principles used in management decisions. Such heuristics are simplified decision making rules. A policy such as "always hire the more experienced person to fill an administrative position" would be an example of a business heuristic. The term heuristics has had specialized connotations in the fields of problem solving and logic (Gigerenzer & Todd, 1999) which are not central to this discussion. Kahneman et al (1982) discussed heuristics as flaws present in human thought which cause biases and errors in thinking and calculation.

Thought on heuristics has in recent years undergone a transition from highly idealized to more realistic models of decision making. Entrepreneurs rely on heuristics to help them make quick decisions that are as accurate as possible given complexity, environmental constraints, human limitations on time and information available as inputs to decision making, and human thought biases. Key contributions to date include that of Manimala (1992), who attempted to define the set of heuristics that entrepreneurs

emphasized, and Busenitz and Barney (1997), who found that use of heuristics distinguished entrepreneurs from corporate managers. In this paper, we extend this decision-making literature in entrepreneurship by examining the relationship between a set of key variables-- intelligence, experience, and years having been mentored--and entrepreneurial heuristics use. We will also test the relationship between heuristics use and entrepreneurial success. In addition, this research develops a new scale to measure heuristics use which may serve as an instrument that other researchers can use in future work in this area. We do not, however, analyze exactly what types of heuristics are most useful for entrepreneurs.

Heuristics are important in the entrepreneurial process for a number of reasons. For instance, it has been argued that the necessity for entrepreneurs to make many rapid decisions as a consequence of a fast moving business environment requires entrepreneurs to use heuristics to expedite their decision making processes (Bhide, 1994). Also, an entrepreneur with superior heuristics may possess a continued source of competitive advantage. An optimal collection of heuristics about how to run a business may constitute a valuable, rare, inimitable and non-substitutable resource (Barney, 2001) which can yield above-average returns.

Finally, heuristics' potential value in entrepreneurial training and education should be noted. As entrepreneurs learn, their mental library of heuristics to address different situations grows into a well-developed schema, a complex mental map of responses to entrepreneurial situations and problems. While personal characteristics such as creativity and intelligence may not be transferable from individual to individual, heuristics, if isolated and codified, may potentially be used to school potential

entrepreneurs. Mitchell's (1994) work on the cognitive scripts of entrepreneurs with varying levels of expertise suggests that such learning is possible.

There has been a dearth of research on business heuristics in recent years. This limited output of research on heuristics may be the result of a number of factors. First, generally, the potential importance of heuristics as a learning tool has perhaps been underestimated due to a simple lack of awareness about the topic. Second, there is currently no generally accepted heuristics instrument to use in heuristics survey research, and other ways to measure heuristics have deficiencies, which makes empirical work especially difficult. Third, research in the field may have slowed because heuristics is truly an interdisciplinary field that requires a thorough grounding in the psychological as well as the business literature.

These factors have hindered further progress, even as researchers seek to explain the deceptively simple question, "how do entrepreneurs think?" (Mitchell, et al., 2007). This article is structured in the following way: first, a review of the relevant literature is presented. Then, a series of hypotheses are presented which address the research questions outlined above. An empirical study testing the hypotheses presented is described and results presented and discussed. Suggestions for future study conclude the research.

### **A Brief Overview of the Heuristics Literature**

Modern thinking on heuristics has been strongly influenced by several research streams: the economist's "rational man" model of thinking, Herbert Simon's (H. Simon, 1976; H. A. Simon, 1957) work on "bounded rationality", the work of Daniel Kahneman and

Amos Tversky, and most recently Gerd Gigerenzer's (Gigerenzer, Todd, & The ABC Research Group, 1999) "fast and frugal" heuristics.

The economist's "rational man" model, as summarized and presented in Bell, Raifa, et al. (1988), presented a set of steps deemed fundamental to a complete and accurate decision. This traditional "*homo economicus*" is an optimal decision maker who exhibits rationality in the economic sense by making decisions, even in uncertain situations, based mainly on self-interest and is assumed to have complete information about the alternatives at hand.

Simon (1976) won the Nobel Prize for his identification of "bounded rationality" and realistic models of decision making. He observed that the assumptions of the "rational man" model were often poor representations of actual decision makers' behavior, and modified the rational man model accordingly. He argued that decision makers may lack critical information, and often work under time and cost constraints. In addition, memory limitations and limited calculating power diminish the thinking capacity of the "rational man".

Accordingly, Simon suggested that individuals use a form of abbreviated decision making labeled "satisficing". This problem solving process using sequential search involves the use of a form of heuristic. "Satisficing" suggests that individuals set a standard and compare the alternatives to that abbreviated standard, rather than surveying all possible alternatives. When the standard is met, that alternative is chosen.

One strand of the heuristics literature focuses on the fact that the presence of heuristics sometimes leads thinkers to errors. Kahneman, Tversky and Slovik (1982) showed that the heuristics that people use in their everyday thinking are subject to flaws

that can compromise their accuracy. For instance, they demonstrated that whether a problem is looked at as involving a potential loss or a potential gain (a process known as “framing” the problem) can change the outcome of a decision even if mathematically the expected outcome in the two situations is the same. They also pointed out that statistical processing biases in human thought processes can lead to faulty conclusions, such as a decision maker concluding that it is more likely that a business school graduate will become an arts manager than a consultant due to the person’s artistic background, even though there are far many more consulting MBA graduates than arts management MBA graduates. Bazerman (2006) enumerated thirteen specific biases that stem from heuristical thought processes, warning that decision makers must be aware of these biases in order to avoid potentially damaging errors.

Gigerenzer, Todd et al. (1999), in another strand of the heuristics literature, assessed heuristics and suggested that they can equal or outperform more data-intensive methods of decision making. They termed this type of heuristics “fast and frugal”. They presented several such shortened decision rules such as “take the best”, which is a decision rule in which the decision maker arranges the factors (“cues”) that influence a decision from most to least influential, then uses only the most important cue in making the decision. Another such “fast and frugal” rule is “take the first”, which involves using the first solution that comes to mind as the answer to a problem. In experiments, Gigerenzer et al. compared these heuristics to more thorough decision making rules such as a weighted regression model which takes into account known cues. They did this comparison across a wide range of statistical questions and environments. Surprisingly, they found that heuristics such as “take the best” can often match and sometimes even

surpass in performance rules based on integrating information from a larger number of cues.

Gigerenzer et al. also made persuasive theoretical arguments which suggest how simple heuristics solve real-world problems which complex computations cannot. Researchers have found support for the proposition that “fast and frugal heuristics” realistically describe how real-world decision makers think in diverse arenas such as doctors’ decisions to prescribe (or not prescribe) depression medication (Smith & Gilhooly, 2006), magistrates’ decisions to allow or to deny bail to potential lawbreakers (Dhami & Ayton, 2001), and air traffic controllers’ identification of incoming planes as “friend” or “foe” (Bryant, 2007)

In the entrepreneurial literature, a number of papers have discussed the use of heuristics by entrepreneurs in particular. Manimala’s (1992) work remains the most thorough work on heuristics as they pertain especially to entrepreneurs. He found that entrepreneurs actually use heuristics by distilling over 100 “rules of thumb” that were used by entrepreneurs from business case studies. He explored the characteristic of “innovativeness” in entrepreneurial businesses by using a case study method to isolate a large set of management “rules of thumb” (for instance, “borrow from the bank when funds are needed for expansion”). This method involved dividing his sample into highly innovative and marginally innovative businesses, and using factor analysis to see which of these heuristics were associated with highly innovative businesses and which with marginally innovative ones.

Bhide (1994) specifically argued that the speed of the entrepreneurial environment and a shortage of good decision making information resulted in entrepreneurs using an abbreviated decision making process.

Bhide's characterization of the entrepreneurial environment as an instigator of error was echoed by Wright, Hoskinsson, Busenitz and Dial (2000). They believed that entrepreneurs use heuristics to interpret turbulent environments. Without heuristic-based logic, they argued, the pursuit of new opportunities becomes overwhelming and excessively costly. In short, heuristics become an entrepreneurial substitute for obtaining facts through research.

In sum, the heuristics field has undergone a transition from highly idealized to more realistic models of decision making. Heuristics are regarded as useful to entrepreneurs because they help them cope with problems characteristic of both their internal mental process and their external environment. Entrepreneurs rely on heuristics to help them make quick decisions that are as accurate as possible given complexity, environmental constraints and human "bounded rationality".

## **Hypotheses Development**

### **Hypotheses**

When the following hypotheses define the relationship between a variable such as intelligence and heuristics use, they refer to the relationships between that variable and each separate one of four aspects or dimensions that comprise heuristics use in the scale developed for this research. The 4 dimensions are: 1) use of a non "rational man" style process to make decisions; 2) decision making speed / use of intuition; 3) use of decision making shortcuts; and 4) awareness of heuristics use. These four dimensions emerged

from items that represent a comprehensive survey of the heuristics literature, especially Bell, Raiffa and Tversky (1988) and Gigerenzer et al. (1999). Details about this heuristics scale are discussed below under “methods”. The heuristics scale represents a broad spectrum of possible aspects of heuristics use.

### **Individual Influences on Heuristics Use**

**Intelligence.** Intelligence has been defined in psychology literature in multiple ways. David Wechsler defined intelligence as having three main aspects: the ability to act purposefully, to think rationally, and to deal effectively with the environment (Sternberg, 2003). Others have stressed various aspects of intelligence in attempts to define the term, including abstract thinking and the ability to adapt and learn, and non-intellectual qualities such as perseverance (Sternberg & Detterman, 1986). The literature on intelligence has seen a flurry of attention directed at concepts such as “emotional intelligence” (Goleman, 2005) which involves social ability, and “impression management”, which involves the ability to influence others interpersonally (Giacalone & Rosenfeld, 1989). Intelligence quotient (IQ) represents the attempts of psychology practitioners to measure intelligence. The father of IQ is generally considered to be Spearman, who proposed in 1904 that all mental functions were the expression of a single general intelligence factor which he designated “*g*” and specialized abilities designated “*s*”. In 1927 he widened his theory to account for the presence of “group factors” not as universal as *g* nor as narrow as *s* (Sternberg, 2003). Spearman created a scale for measuring intelligence based on the observation that performance by individuals on a variety of intellectual tasks expressing *g* tends to be similar, therefore gathering some of these tasks in an IQ instrument could reliably measure IQ. Wechsler in 1940 rounded out

the measurement of IQ by creating a scale that measured non-intellectual factors pertinent to general intelligence, factors such as motivation, physical health, level of aspiration, anxiety, level of maturation, and life history (Matarazzo & Denver, 2001).

It is widely recognized today that there exists various types of intelligence. A musical genius might be unable to balance his or her checkbook or speak well in public, for instance. Despite this apparent truth, however, it still seems possible to make meaningful hypotheses about general intellectual ability and the use of business heuristics.

A hypothesis that greater intellectual ability in entrepreneurs is associated with decreased use of entrepreneurial heuristics is articulated as follows. Higher IQ individuals, in general, have a greater ability to process information in ways such as inferring the meaning of words which they have never encountered before from their context, and acquiring the content of the curricula of schools (Brody, 2000). It seems logical that these findings can be extended to the study of entrepreneurs, and their processing of information that they learn from cues in the business environment in the course of starting and managing their businesses.

It is logical that as entrepreneurial intelligence increases, higher intellect entrepreneurs, possessing a greater ability to work out problems through a detailed, thorough thought process, should be expected to rely on heuristics less. Less intelligent entrepreneurs, with less ability for rational analysis, should be expected to rely on heuristics more.

Counterarguments to the above do exist. For instance, it might be suggested that higher intellect entrepreneurs, who find it easier it to acquire and use information, may

seek out and use heuristics more. Also, more intelligent individuals may recognize the value of the potential gains inherent in heuristics acquired from experience. For instance, Bill Gates, the highly intelligent founder of Microsoft, has said that one of his entrepreneurial hobbies is reading biographies of leaders in an effort to improve his performance as a strategist (Lowe, 1998). Despite these potential counterarguments, however, we expect the following hypothesis to find support in the data:

**Hypothesis 1:** Entrepreneurial intelligence will be negatively correlated with the dimensions of entrepreneurial heuristics use.

**Experiential Variables: Entrepreneurial Experience, Business Experience, Managerial Experience, Industry Experience, and Experience Being Mentored**

The proposed association between entrepreneurial and industry experience and heuristics use is simple. We follow Politis' (2005) conceptual framework that entrepreneurs learn heuristics over time in their careers through being exposed to, and challenged by, new work situations, and through environmental feedback by noting the consequences of their actions. Bryant (2007) created a computer simulation in which participants were asked to decide whether an incoming "plane" (an asterisk on a computer screen) was a "friend" or a "foe". He programmed in "cues" which the participants could use to help them make this decision; one cue was 90% effective in discriminating between the two groups, another was only 50% effective. This experiment emulates the "real world". Over time, through repeated exposure to various domain cues, entrepreneurs learn the hierarchy of the most effective factors that they need to use to solve their problems.

A particularly valuable way of abstracting heuristics from the world comes from relationships with a mentor. Russell and Adams (1997) defined mentoring as “an intense interpersonal exchange between a senior experienced colleague (mentor) and a less experienced junior colleague (protégé) in which the mentor provides support, direction and feedback regarding career plans and personal development.” (1997: 2) Since entrepreneurs are typically firm leaders who work on their own, it seems particularly important that they benefit from the guidance of experienced businesspeople at some point in their careers. This infusion of a concentrated accumulation of heuristics may be effectively transmitted from a prior boss, a parent in the business world, or even an executive coach or consulting firm that can confer “best practices”. Mitchell (1994) suggested that interactions between novice entrepreneurs and experienced entrepreneurs, when the motive is the accumulation of an entrepreneurial “script”, can effectively result in efficient emulation of the expert.

A well-known entrepreneur who systematically sought advice and heuristics is Warren Buffett, the investor who has led his investment and insurance firm Berkshire Hathaway to an #13 rank among the 2009 Fortune 500. Early in Buffett’s career, he was influenced by the investment philosophies of Professor Benjamin Graham. Buffett learned several key principles of investing from Graham and Dodd’s book Security Analysis (Graham & Dodd, 1934). Then, after graduating from Columbia, the young Buffett acquired additional investing heuristics by working directly for Graham at his mentor’s investment firm before returning home to Nebraska to found Berkshire Hathaway (Cunningham, 2001).

Hence, both anecdotal and previous empirical research supports the following hypotheses:

**Hypothesis 2:** Increased entrepreneurial experience will be positively correlated with the dimensions of entrepreneurial heuristics use.

**Hypothesis 3:** Increased business experience will be positively correlated with the dimensions of entrepreneurial heuristics use.

**Hypothesis 3a:** Increased managerial experience will be positively correlated with the dimensions of entrepreneurial heuristics use.

**Hypothesis 3b:** Increased experience within one industry will be positively correlated with the dimensions of entrepreneurial heuristics use.

**Hypothesis 4:** Increased experience being mentored will be positively correlated with the dimensions of entrepreneurial heuristics use.

In addition to simply using heuristics more, it is noted that experience should also most likely help entrepreneurs recognize which heuristics are the best and most helpful. Testing the presence of useful heuristics is beyond the scope and methodology of this research.

### **Heuristics Use and Entrepreneurial Success**

Research has shown that there are many variables that impact business success, including human capital factors, social and demographic factors, and individual personality differences (Ng, Eby, Sorensen, & Feldman, 2005). This research proposes use of heuristics as another variable which influences entrepreneurial business success. The reasoning behind this link is straightforward. If an entrepreneur becomes intimately

acquainted with the codified rules and principles that determine effectiveness in his or her line of work, the entrepreneur is likely to attain better results.

For the connection between heuristics and entrepreneurial success to hold, certain conditions need to be fulfilled. First, the entrepreneur must seek heuristics from accurate sources, distilling the true causes of effectiveness from other, non-causative agents. If the entrepreneur's mentors lack an accurate knowledge of useful heuristics, then the entrepreneur will learn faulty heuristics, which is perhaps worse than having no mental paradigm at all. There should also not be so many factors related to the business and its industry that the "key success factors" of an industry are unclear to the entrepreneur or their advisors.

This research assumes that the principles which govern industry success can be learned by a person with significant field experience, and that most mentor-entrepreneur knowledge transfers generally transmit accurate decision heuristics. Given these caveats, we propose:

**Hypothesis 5:** Increased use of heuristics (increases in the dimensions of entrepreneurial heuristics use) will be positively correlated with greater entrepreneurial success.

It is acknowledged that heuristics may not be present in all business circumstances. Recognizing this fact should not eliminate the probability that having useful heuristics in a variety of areas should be a hallmark of the more successful entrepreneur.

We continue by examining the hypothesized effect of a fast-moving industry environment on the relationship between use of heuristics and entrepreneurial success.

High industry rate of change, also known as high “clockspeed”, is characteristic of a number of industries. Two which have been studied in the literature for their turbulent nature are the forest products industry (Fredrickson & Mitchell, 1984) and the microcomputer industry (Bourgeois & Eisenhardt, 1988). Clockspeed has been found to influence a variety of aspects of the modern organization. For instance, Calantone and Garcia (2003) discussed the need for increased new product development in the face of rapid obsolescence in fast-moving environments, due in part to frequently changing customers’ preferences and demands. High clockspeed influences an organization’s internal aspects as well. DeLuca (1988) identified the dramatic decrease in employee-firm loyalty in the face of the rapid turnover in a volatile environment. Finally, a strategic management foundation is the need to achieve “fit” between an organization’s structure and the demands of its external environment (Chandler, 1966). Company management may achieve such a fit in the face of high environmental clockspeed by decentralizing decision making (Calantone, et al., 2003), or in emergency organizations, by developing a highly flexible structure known as the “Incident Command System”, which adds much needed flexibility during rapid change while still maintaining needed bureaucratic elements (Bigley & Roberts, 2001).

Following Wright, Hoskinsson, Busenitz, and Dial (2000), we argue that, in such fast moving industry environments, entrepreneurs who do not use heuristics will find that the many activities involved in pursuing new opportunities will result in decision paralysis. Two empirical studies, Glazer and Weiss (1993) and Fredrickson and Mitchell (1984), unequivocally found that company formal planning in highly turbulent environments reduced firm performance. The Glazer and Weiss study concluded that

formal planning in high velocity industries interfered with recognizing changes as they occurred, thus leading to performance declines over time. The earlier Fredrickson and Mitchell study found that the more comprehensive the executive decision making process of the participants' was, the poorer the firm performance.

The following hypothesis is proposed:

**Hypothesis 6:** In a quickly moving industry environment, there will be a significant positive relationship between use of heuristics and entrepreneurial success.

## **Methods**

### **Participants**

This research necessitated creating an operational definition of “entrepreneur” to qualify subjects for participation in the study. Following established views of the entrepreneur in the literature (Baron & Ward, 2004; Mitchell, et al., 2002), this study considers entrepreneurs to be individuals who recognize and exploit new business opportunities by founding new ventures. Specifically, two qualifications were defined: that the study participant be the founder of a business, and that the entrepreneur have been a principal, manager or advisor of the firm for at least the past 2 years. This tenure requirement is necessitated in part by elements of the questionnaire, which required firm and personal data going at least two years back into the past.

Two separate samples made up the total group of participants in the survey. The first sample was derived from members of a Philadelphia entrepreneurial association known as The Entrepreneurs Forum. The Forum is Philadelphia's largest association for founders of entrepreneurial ventures to network and share information on various topics relevant to entrepreneurs. The researchers obtained permission from the Board of

Directors of this group to include a brief summary of the research and an internet link to the survey instrument in two of the monthly mailings on the Entrepreneurs Forum's monthly newsletter. This newsletter was delivered via email to a total population of 3,123 members of the Entrepreneurs Forum. From the two separate monthly mailings to this same population, 45 total respondents to the survey instrument were obtained for a response rate of approximately 1.4 %. It should be noted that some of the 3,123 members of the Entrepreneurs' Forum are not themselves entrepreneurs; they are instead lawyers, bankers, and providers of services to entrepreneurs. Thus the response rate of 1.4% just mentioned is probably artificially low. An attempt to determine exactly what percentage of the members of the Entrepreneurs Forum were entrepreneurs and what percentage were service providers to the entrepreneurs was met with the response that the Entrepreneurs Forum does not keep track of the composition of their membership.

The second sample was comprised of entrepreneurs from the network of the Director of Temple University's Innovation and Entrepreneurship Institute (I.E.I.). An email was sent to selected personal contacts requesting that they fill out the survey, which produced 19 additional respondents, resulting in a total of 64 respondents.

An independent-sample t test was performed on these two subsamples in order to compare them in important aspects and confirm that aggregating the two samples was appropriate. This statistical analysis revealed that the entrepreneurs of the Entrepreneurs Forum ran larger businesses than the entrepreneurs in the IEI network as measured by company net income in the three successive years of 2004 ( $p < .10$ ), 2005 ( $p < .05$ ), and 2006 ( $p < .10$ ). However, in comparisons of important personal demographics, including intelligence (as measured by High School SAT score and college undergraduate grade

point average), age, years of work experience, and years as an entrepreneur, the two groups did not significantly differ as would be indicated by a p value of .10 or less. It should be emphasized here that the sample sizes of these two groups was extremely small, which might call into question the accuracy of these findings.

The survey instrument was delivered to the entrepreneurs by internet using a popular internet survey construction and distribution tool called SurveyMonkey (<http://www.surveymonkey.com/>).

## **Measures**

### **Independent Variables**

**Intelligence.** High School SAT and College GPA were used as proxy variables to suggest intelligence.

**Entrepreneurial experience.** The study participants were presented with the following definition and explanation of the definition of an entrepreneur: “an entrepreneur is an individual who is the founder of a business. Entrepreneurial experience is the time spent actively engaged in the founding or management of that business. For instance, a person who founded a business in 1992, managed it for 3 years, then sold it in 1995 and had no subsequent entrepreneurial experience would be considered to have 3 years of entrepreneurial experience.” Respondents were then asked how many years they have spent as entrepreneurs fitting this criterion. They were also asked how many businesses they had started.

**Business experience.** Entrepreneurs were asked to enumerate their years of work experience in their current business.

**Managerial Experience.** Respondents were asked how many years of managerial experience they had.

**Industry experience.** Entrepreneurs were presented with the following generally accepted definition of an industry: “An industry is generally any grouping of businesses that share a common method of generating profits, such as the "music industry", the "automobile industry", or the "cattle industry". They then were presented with an abbreviated list of North American Industry Classification System (NAICS) codes, and were asked to choose the one that best represents their industry. They were then asked to enumerate how many years they have been employed in that industry.

**Years having been mentored.** The survey participants were presented with the following definition of a mentor from the literature: “an influential individual in [one’s] work environment who has advanced experience and knowledge and who is committed to providing upward mobility and support to your career.” (Lankau & Scandura, 2002) They were then asked how many years they have worked for mentors fitting this description.

### **Dependent/Independent Variable: Entrepreneurial Heuristics Use**

Central to this research was the creation of a new scale to measure heuristics use. Heuristics use serves as both a dependent variable (versus intelligence, various types of experience, and years being mentored) and an independent variable (versus measures of success) in this study. The primary existing scale in the entrepreneurial literature which deals with heuristics use is Busenitz and Barney’s (1997) scale which employed problem-solving narratives to reveal heuristical thinking and use. Busenitz and Barney’s approach was, at the time, a significant step forward in heuristics research, but it has several

shortcomings that hinder its use in this study. First, elements of the scenarios employed are dated. The scenarios would need to be re-worded for use in a current survey. Second, this approach does not capture the possible multiple dimensions of heuristics use. The introduction of a new scale for heuristics is therefore an important step forward for the field and was necessary for the testing of the hypotheses presented in the model above. Through a thorough examination of the related literature, a total of 27 items were generated for this new heuristics scale. Item generation for heuristics use was influenced most significantly by the theoretical work of Baron (2004), Bell, Raiffa and Tversky (1988), Busenitz and Barney (1997), and Gigerenzer et al.(1999). See Table 1 for a complete list of all of the questionnaire items.

Items were scored on a five-item Likert scale with values ranging from 1 (disagree) to 5 (agree). Factor analysis using principal components analysis with promax rotation confirmed the existence of 5 distinct factors comprising distinct aspects of heuristics use. These factors were chosen because they had eigenvalues greater than one and because the number of factors retained represented approximately 70% of the total variance (Stevens, 2002).

The next step was to decide which items load with which factors. Table 2 presents the rotated component pattern matrix. The relevant loadings on each factor are bolded.

**TABLE 1. Questionnaire items**

1. I make it a priority to try and learn business decision making principles from books, experts in my field, or other sources.
2. I explore many options when making a business decision rather than relying on what initially comes to mind.
3. I use decision making shortcuts as much as possible.
4. I prefer to use rational analysis when faced with business issues rather than “relying on my gut”.
5. I am a fast decision maker.
6. I have one rule of thumb I apply to many decisions.
7. I am aware of some basic guiding principles by which I make decisions in my business life.
8. I consciously try to take myself through the steps of a good decision when I have to make decisions.
9. I like to think through all of my decisions thoroughly.
10. I enjoy having to make decisions quickly.
11. I consider my decision making strategies integral to my business success.
12. When I make business decisions I try to “keep them simple”.
13. I don’t like to be rushed when making a business decision.
14. I highly value my decision making strategies.
15. I seldom use decision making shortcuts
16. I often use decision making shortcuts.
17. I objectively weigh the “pros” and the “cons” of a course of business action before committing to it.
18. I try to consider as many factors as possible when making business decisions.
19. I always try to make decision making shortcuts.
20. When I am confronted with a business problem, I gather factual information about it before trying to solve the problem.
21. When making business decisions, I sometimes think about how statistically probable certain events are.
22. I have lots of small rules of thumb I rely upon when I make decisions.
23. I am often aware of relying on my intuition when making business decisions.
24. I don’t usually think of the decision process involved when making a decision.
25. I have many mental rules of thumb related to financial matters.
26. I have many mental rules of thumb related to marketing matters.
27. I have many mental rules of thumb related to making my product unique in various ways.

**TABLE 2. Results of Factor Analysis***Rotated Component Matrix Using 27 Entrepreneurial Heuristics Items*

Entrep. Heuristics Items	Component				
	1	2	3	4	5
Learn about dec.	-.383	-.317	-.212	.131	-.089
Explore many options	<b>.632</b>	-.069	.188	.003	-.146
Use dec shortcuts	-.181	<b>.477</b>	<b>.593</b>	.324	-.361
Use rational analysis	<b>1.045</b>	.151	-.140	-.058	.197
Fast dec maker	-.180	<b>.766</b>	.369	.102	-.085
Use a rule of thumb	.511	.096	-.105	<b>.734</b>	.027
Aware of using heur	-.477	.152	-.109	.164	.326
Aware of dec steps	<b>.693</b>	-.142	-.115	.060	-.037
Think through dec	<b>.852</b>	.098	.043	.157	.086
Make dec quickly	.170	<b>.921</b>	.255	-.129	-.079
Dec integral to success	-.365	<b>.482</b>	-.123	-.160	.171
Keep bus dec simple	-.070	-.775	-.045	-.059	.163
Avoid rushing dec	<b>.668</b>	.411	.441	-.259	.082
Value dec making strat.	<b>-.652</b>	.321	.107	-.091	.035
Seldom use shortcuts	.029	.067	<b>.874</b>	-.122	.205
Often use shortcuts	-.010	.198	<b>.850</b>	.072	.094
Weigh pros & cons	<b>.846</b>	-.048	.081	.267	.027
Consider many factors	<b>.740</b>	-.153	.035	.236	-.126
Make dec shortcuts	.211	-.082	<b>.455</b>	.422	-.002
Gather facts	<b>.772</b>	-.109	.206	.229	..033
Analyze dec stat.	<b>.745</b>	.108	-.406	.096	-.042
Rely on own heur.	-.120	-.252	.459	<b>.469</b>	.278
Rely on intuition	-.040	<b>.526</b>	-.419	.176	.143
Don't think thoroughly	-.087	.326	.180	-.019	..055
Have financial heur	-.262	-.345	.323	.006	<b>.758</b>
Have marketing heur	..215	.157	.009	.057	<b>.957</b>
Have differentiation heur	.006	.101	.101	.027	<b>.889</b>

Factor 1 comprised 9 items which were: explore many options about a decision (reverse scored); use rational analysis instead of gut (reverse scored); aware of steps of a decision (reverse scored); think through decisions thoroughly (reverse scored); avoid rushing through decisions (reverse scored); value decision making strategies; weigh pros vs. cons of decisions (reverse scored); consider many factor of decisions (reverse scored); gather factual information about decisions (reverse scored); and analyze decisions statistically (reverse scored). Factor 1 was labeled “Non Rational Man Process”. Cronbach’s Alpha for Factor 1 was .837.

Factor 2 was composed of 5 items which were: use decision making shortcuts; fast decision maker; make decisions quickly; decision strategies integral to own success; and rely on intuition. Factor 2 was labeled “Fast / Intuitive Decision Making”. Cronbach’s Alpha for Factor 2 was .725.

Factor 3 was composed of 4 items which were: use decision making shortcuts; seldom make decision making shortcuts (reverse coded); often make decision making shortcuts; make decision making shortcuts. Factor 3 was labeled “Use Decision Making Shortcuts.” Cronbach’s Alpha for Factor 3 was .815.

Factor 4 was composed of 2 items which were: aware of using heuristics; and rely upon lots of one’s own heuristics. Factor 4 was labeled “Awareness of Heuristics Use”. Cronbach’s Alpha for Factor 4 was .519. It is noted that the Alpha for Factor 4 is lower than the .7 value often considered necessary to have a reliable scale, although it must also be noted that Kline (1999) observes that when dealing with psychological constructs, values of Cronbach’s Alpha below even .7 can sometimes be expected and acceptable.

Factor 5 was composed of 3 items which were: have financial heuristics; have marketing heuristics; have differentiation heuristics. Factor 5 was labeled “Have Specific Types of Heuristics.” Cronbach’s Alpha for Factor 5 was .864. Factor 5 was not used as one of the dimensions of heuristics use to correlate with the independent variables of the hypotheses because it related to very specific types of heuristics that entrepreneurs might employ; it was not a general indicator of heuristics use as were factors one through four.

It is important to report evidence of the validity of the scale as a whole. Convergent validity, which measures the extent to which different operationalizations of the same construct produce similar results, was assessed by collecting data for the Busenitz and Barney (1997) measure of heuristics use and correlating it with the scores on the new heuristics scale. The correlation between the two was not statistically significant (p value of .443) indicating some lack of convergent validity. This was not unexpected since the two scales were substantively different: the Busenitz and Barney measure was designed primarily to measure statistical versus heuristic thinking alone, while the new scale developed for this research measured various distinct dimensions of heuristic thinking.

### **Dependent Variable: Entrepreneurial Success**

A dependent variable in this study’s model (in relationship to entrepreneurial heuristics use) is entrepreneurial success. This study sought to show that entrepreneurial heuristics use affects entrepreneurial success.

Defining individual business success requires several considerations. Is a small entrepreneurial business, for instance, necessarily less “successful” than a larger entrepreneurial business? Perhaps the operator of the small business is content to live in

a “lifestyle” business that suits his or her needs. Because the term “success” is ambiguous, the literature has found it appropriate to adopt a dual definition of success consisting of objective and subjective measures of success.

This study selected measures appropriate for entrepreneurs, the target population. For instance, one frequently used objective measure of individual career success in the literature is promotions attained (Ng, et al., 2005). This measure clearly does not pertain to entrepreneurs, though, since they run their own businesses.

This research employed several measures to assess success objectively and subjectively. Subjective measures of success were comprised of Greenhaus, Parasuraman and Wormley’s (1990) widely used 5 item scale for subjective / intrinsic career satisfaction, and two additional items asking respondents to rate on a five point scale the degree to which “I am satisfied with the success I have achieved relative to others”, and “I am satisfied with the success I have achieved relative to my own expectations.” The objective measures of success were comprised of average recent company revenues (controlling for industry), and number of employees (also controlling for industry). The data for the objective measures of success was gathered from survey respondents.

### **Procedures**

All statistics were performed using SPSS Version 17.0. The stated hypotheses were tested individually using bivariate or partial correlation analysis with appropriate control variables. Type of industry (in the partial correlation analysis for Hypothesis 5) was controlled for. “One-tailed tests” were employed. To ensure nothing was being overlooked statistically by not using regression analysis, regression models were created regressing one consolidated measure of heuristics use (the IV) against each measure of

entrepreneurial success individually (the DV's). No new information was found by this analysis. Next, the 4 dimensions of heuristics use were regressed against each measure of entrepreneurial success. The only variable in the models that was statistically significant was also the only variable that was statistically significant using correlation analysis. Thus it is concluded that regression modeling does not add additional worthwhile insights into the analysis that follows below.

### **Results**

Descriptive statistics were generated for the variables in the study. Means, standard deviations and a full correlation matrix are set forth in Table 3. Regarding several key demographic statistics which may be useful in considering the generalisability of the sample's results to both the general population and to the population of entrepreneurs more specifically, the mean age of the sample was 48.2 years, and the sample was 64% male and 36% female. These demographic statistics suggest that the members of the sample were older and tended more towards the male gender than the general population. Comparing this study's gender statistics to gender characteristics of a large scale study of 4,928 entrepreneurs known as the Kauffman Firm Survey (KFS) (DesRoches & Barton, 2009), it was found that the KFS sample had a male-to-female ratio higher than this study's sample; it comprised 74% men and 26% women. Mean age was not available for the KFS data since the data was collected in ordinal form.

**TABLE 3. Means, Standard Deviations and Correlations of Key Variables**

Variables	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1.Product Lifecycle (months)	23.6	30.2																		
2.% rate of capital asset depreciation	19.3	22.6	-.35																	
3.# Years since last corp. restruc.	2.4	2.2	.37	.31																
4.Self rating of success vs others	3.7	1.1	-.26	-.04	.14															
5.Self rating of success vs own expectations	3.4	1.1	-.03	-.14	.31	.60														
6.High School SAT Score	1219.6	143.8	-.02	.07	.09	-.01	-.05													
7.College Undergraduate GPA as of 2008	3.1	.4	-.08	-.04	.14	-.09	-.05	.16												
8.Number of businesses started	2.9	5.4	-.35	-.08	.34	.19	.18	-.03	.07											
9.Years in current business	9.6	10.8	-.28	.35	.37	-.01	-.14	-.10	.10	.17										
10.Years employed in the industry	15.9	11.7	-.05	.36	.38	-.04	-.02	.01	.15	.07	.77									

**TABLE 3. (Continued)**

Variables	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
11.Years of managerial experience	14.8	11.7	-.20	.33	.44	.78	-.02	.30	.18	.13	.70	.70								
12.Years spent being mentored by others	4.3	5.3	.22	-.06	.12	.06	-.02	-.11	.23	.33	.24	.08	.09							
13.Educ. Attainment	4.4	1.5	-.02	-.39	-.13	-.06	-.07	.07	-.05	-.03	.09	.05	-.05	-.03						
14.Sum of career satisfaction scale	18.1	4.3	-.03	-.11	.07	.47	.71	-.01	-.11	.08	-.15	-.12	-.11	-.11	-.04					
15.Factor1 Non-rational process	27.4	8.2	-.35	.07	.01	-.05	-.14	-.24	-.37	-.15	-.04	.11	.11	-.03	-.02	-.02				
16.Factor2 Speed	17.2	4.1	.10	.07	.05	.08	.13	.22	.17	.11	-.27	-.22	-.09	.07	-.10	.26	-.27			
17.Factor3Use Decision Shortcuts	11.5	3.7	-.18	.13	.13	.01	.08	-.01	-.04	.03	-.02	-.10	.09	.36	.11	.07	.44	.29		
18.Factor4 Aware of Heuristics Use	6.0	1.9	.36	-.13	-.22	-.11	.00	.00	.14	.00	-.15	-.12	-.15	.23	.02	.45	.32	-.04	.45	
19. Age (years)	48.2	12.3	.04	-.39	-.13	-.06	-.07	.07	-.05	-.03	.09	.05	-.05	-.03	.28	.04	.03	-.25	.11	.00

Each independent variable was correlated with each of the first 4 factors derived, from the scale of heuristics. Thus 4 factors in total were correlated with each independent variable. In this results section, the findings for each of the above hypotheses with regards to the 4 factors will be discussed in turn. These results are listed in Table 4. As Table 4 indicates, there are a number of relationships that were found to be statistically significant from this analysis. We consider on each hypothesis individually:

Hypothesis 1 was that higher intelligence in entrepreneurs would correlate with less heuristics use. This hypothesis was supported. Table 4 sets out the results. Note that both High School SAT score ( $r = -.24$ ,  $p$  value of  $.057$ ) and College GPA ( $r = -.37$ ,  $p$  value  $< .01$ ) were found to be statistically significant at the  $.05$  level or less when correlated with Factor 1 of Heuristics Use, labeled “non-rational man process.” Thus, High School SAT score and College GPA increased as heuristics use decreased.

Hypothesis 2, that increased entrepreneurial experience results in increased use of heuristics, was not supported for any of the dimensions of heuristics use.

Hypotheses 3, 3a and 3b were that increased business experience, industry experience, and managerial experience result in increased use of heuristics. This study found a significant negative relationship between the heuristics use dimension of “Fast/Intuitive Decision Making” at the  $.05$  level ( $r = -.22$ ,  $p = .04$ ) in relation to industry experience. This negative correlation coefficient indicated that the direction of the findings is contrary to the hypothesized relationship.

Hypothesis 4, which posited a correlation between years having been mentored and heuristics use, was supported for Factor 3, “Use of Decision Making Shortcuts.” The

**TABLE 4. Key Variables' Relationships to the Dimensions of Entrepreneurial Heuristics**

	<b>Factor 1: Non "Rational Man" Process</b>	<b>Factor 2: Decision making speed &amp; intuitiveness</b>	<b>Factor 3: Use of Decision Making Shortcuts</b>	<b>Factor 4: Awareness of own heuristics use</b>
<b>High School S.A.T. Score</b>	r=-.24 <sup>+</sup> p=.06	r=.22 <sup>+</sup> p=.07	r= -.007 p=.48	r = -.04 p= .40
<b>College Grade Point Average</b>	r= -.37*** p=.005	r=.17 p=.13	r= -.04 p=.40	r=.14 p=.18
<b>Number of Business Start-Ups</b>	r= -.15 p=.13	r=.11 p=.20	r=.03 p=.41	r=.003 p=.49
<b>Years as an Entrepreneur</b>	r=.001 p=.50	r=-.11 p=.21	r= -.14 p=.14	r= -.13 p=.16
<b>Business Experience</b>	r= .03 p=.41	r= -.17 <sup>+</sup> p= .09	r=.00 p=.49	r= -.10 p=.23
<b>Industry Experience</b>	r= -.03 p=.39	r=-.22* p=.04	r= -.10 p=.23	r= -.12 p=.19
<b>Years of Managerial Experience</b>	r=.11 p=.20	r= -.08 p=.25	r=.09 p=.25	r= -.15 p=.13
<b>Experience Being Mentored (Years)</b>	r=.03 p=.40	r=.07 p=.30	r=.36** p=.003	r=.23* p=.04
<b>Greenhaus Scale of Career Success</b>	r= -.05 p=.35	r= .26* p=.03	r=.06 p=.31	r=.02 p=.43
<b>Self-rated success vs. other people</b>	r= -.05 p=.37	r= .08 p=.29	r=.01 p=.48	r=.11 p=.22
<b>Self-rated Success vs. Own Expectations</b>	r= -.14 p=.16	r=.13 p=.17	r=.08 p=.28	r=.002 p=.50
<b>Objective Measure Of Success, # of Employees in 2006</b>	r= -.19 p=.15	r= .28 p=.057*	r= -.06 p=.37	r= -.006 p=.49
<b>Objective measure Of Success, Firm Revenues in 2006</b>	r= -.08 p=.34	r=.22 p=.12	r=.08 p=.33	r= -.08 p=.33
<b>Level of education attained</b>	r=.02 p=.88	r=.10 p=.44	r=.11 p=.40	r=.02 p=.99

<sup>+</sup>=p<.10

\*=p<.05

\*\*=p<.01

\*\*\*=p<.001

sign on the correlation coefficient of .36 was positive and highly significant ( $p=.003$ ), indicating that as years being mentored increases the use of decision making shortcuts increases. Also, as years being mentored increased, entrepreneurs were increasingly conscious of their own use of heuristics ( $r=.23$ ,  $p=.04$ ).

Hypothesis 5 was that increased use of heuristics is correlated with increased subjective and objective career success. One of the two measures of objective career success, firm number of employees (controlled for the various industries the entrepreneurs worked in), was correlated with the speed / intuition dimension of heuristics use ( $r= .28$ ,  $p=.057$ ). This implies that the faster the decision making speed of the entrepreneur, the larger the entrepreneur's firm will be. The second measure of objective success, firm revenues (controlled for type of industry), had no significant correlations or p values with any of the heuristics dimensions.

Now consider the second type of success studied in this research, which is subjective career success. This type of success is represented by the Greenhaus Scale of Career Success, self-rated success versus other people, and self-rated success versus one's own expectations. Table 4 displays a positive relationship significant at the .05 level between the Greenhaus, Parasuraman et al. scale of career success and a speedy / intuitive decision making process.

Hypothesis 6 was that in a fast moving environment, there will be a significant relationship between use of heuristics and entrepreneurial success. The data did not support this expectation. Two variables representing clockspeed (the speed of the entrepreneurial environment) were individually multiplied by the variable representing entrepreneurial heuristics use, then regressed against measures of entrepreneurial success.

This was the appropriate statistical procedure to test interaction effects between the aforementioned variables. Each time, the result was not significant at the .05 level. See Table 5.

**TABLE 5. The relationship between heuristics use and success in a quickly moving environment**

5a. IV is heuristics scale\*length of product lifecycle; DV is self rating of success versus others.

**ANOVA<sup>b</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.784	1	1.784	1.052	.320 <sup>a</sup>
	Residual	28.847	17	1.697		
	Total	30.632	18			

a. Predictors: (Constant), FastHeurInteract1 (HeuristicsSum\*Product Lifecycle)

b. Dependent Variable: Self Rating of Success Versus Others

5b. IV is heuristics scale\*Capital Asset Depreciation rates; Dependent variable: Greenhaus scale of career satisfaction

**ANOVA<sup>b</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.853	1	5.853	.267	.609 <sup>a</sup>
	Residual	811.839	37	21.942		
	Total	817.692	38			

a. Predictors: (Constant), FastHeurInteract2 (HeuristicsSum\*CapitalAssetDepreciation Rates)

b. Dependent Variable: Sum of Career Satis. Scale (Greenhaus, Paras...)

5c. IV is same as in Table 5b. Dependent variable: self rating of success versus others

**ANOVA<sup>b</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.939	1	.939	.815	.372 <sup>a</sup>
	Residual	42.650	37	1.153		
	Total	43.590	38			

a. Predictors: (Constant), FastHeurInteract2 (HeuristicsSum\*CapitalAssetDepreciation Rates)

b. Dependent Variable: Self Rating of Success Versus Others

## Discussion

The major findings of this study are classified as: the importance of a mentoring relationship to the entrepreneur; nonadaptive thinking styles; and a demonstrated relationship between speed and measures of success.

### The Importance of Being Mentored

Perhaps the most important and interesting finding of this study was the finding that suggests most types of actual work and entrepreneurial experience do not result in increased use of heuristics for any of the 4 dimensions of heuristics use reviewed here. The only exception was a significant p value at the .05 level for the correlation of industry experience and speed/intuition. Non-intuitively, the negative sign on the correlation coefficient ( $r = -.22$ ) suggests that as industry experience increases, decision making speed decreases, which runs counter to the theory presented earlier in this paper that as experience increases, all forms of heuristic use should increase. Generally, heuristics use is signaled by greater decision making speed.

The results also suggest that greater heuristics use in its various dimensions does not accompany or result from greater business or entrepreneurial experience, given the relatively low correlation coefficients and non-significant p values for these relationships.

The experience of being mentored is the only variable in this study correlated with greater heuristics use ( $r = .36$ ), with a noteworthy p value of .003. Additionally, the correlation between being mentored with awareness of heuristics use indicates that, as individuals go through the mentoring process, they become more aware of their use of heuristics more generally.

Perhaps it is not surprising that the mentoring process is a highly effective way of transferring heuristics. What seems surprising is that greater experience does not seem to result in a learning process that confers usable heuristics to entrepreneurs. This finding requires an explanation.

Theorists distinguish between different types of knowledge, including tacit knowledge, which is particularly hard to transfer, and explicit knowledge, which is easier to teach and exchange between individuals. Perhaps mentoring succeeds in exchanging both tacit and explicit knowledge in a way that is not possible through simply participating in the business environment. One might sit in an office next to the CEO of a company for many years, and observe the CEO writing reports, making phone calls, etc., but never learn how to be a CEO since this type of knowledge demands direct explanation from the CEO. Also, many entrepreneurs may find themselves having “one year’s experience ten times instead of ten years’ experience”. A master chef, for instance, may learn his or her fundamentals in a concentrated period of time while in school, and then during the actual period of working as a chef spend most of his or her work time preparing recipes and learning relatively little new about the art of cooking.

Given the findings, it seems useful to explore the degree to which education does, or does not, confer usable heuristics. Data was collected for educational attainment of the entrepreneurs in this study. Table 4 lists the results. The results suggest that, at least for the sample considered in this study, more years of educational attainment in general does not seem to lead to a more heuristic thinking process or greater use of heuristics.

Mentoring, then, seems to play a valuable and unique role for the entrepreneurs in this study in relation to amassing and using useful heuristics. The results suggest that it is a role that is not filled alternatively by experience or education.

### **Nonadaptive Thinking Styles**

The choice of “rational-man” style thought processes versus the use of heuristics, and decision speed were thought to relate as follows: when the speed of the entrepreneurial environment increases (higher industry clockspeed), entrepreneurs will seek a more heuristic mode of decision making. This will be evidenced in greater use of specific heuristics, and faster decision making speed.

The findings do not support this analysis. Tests using interaction variables (Hypothesis 6- Table 5) found that in a fast moving environment, there failed to appear a significant relationship between use of heuristics and entrepreneurial success. This lack of significant findings challenges the supposition that entrepreneurs respond to changes in their environments by changing their decision making styles.

The reasons why individuals do not change their decision making styles in response to external changes should be considered. First, individuals cannot change their decision making styles if they do not possess efficient, useful heuristics which serve as an alternative to a more thorough, “rational man” style of decision making. One would expect inexperienced entrepreneurs to be in such a position. Second, entrepreneurs may not be as time pressured as some researchers have suggested. Even though entrepreneurs quickly make many decisions there may be sufficient time for a rational decision making process for the majority of their decisions, or at least for the most important ones. Third, individuals may possess characteristic “styles” of thinking. Some entrepreneurs may be

used to thinking more using heuristics, others may be used to thinking more analytically and thoroughly.

### **Relationship of Speed to Measures of Success**

These findings established the theoretical link between the dimensions of cognitive heuristics use and measures of business success. To begin with, the entrepreneurs' firms' number of employees was positively correlated with Factor 2 (speed/intuition), controlling for type of industry. This finding may suggest that entrepreneurs who process information more quickly are better able to handle the management demands of larger firms. However, this study also found that firm revenues were not correlated with speed/intuition, controlling for type of industry. It is theoretically unclear why revenues, which also relate to firm size, would not also be significant when correlated with speed/intuition, if it is true that faster decision making speed and more intuitive problem solving allows for management of a larger firm.

The results for the subjective measures of success were also theoretically unclear. The dimension of speed/intuition (Factor 2) was correlated with the Greenhaus Scale of Career Success ( $p < .05$ ), suggesting that greater subjective work satisfaction is correlated with making faster and more intuitive decisions. An explanation cannot be that greater speed led to more use of beneficial heuristics, since Factor 3 (use of heuristics) and Factor 1 (non-rational man process) both had low correlations with the Greenhaus scale and were not statistically significant at the .05 level or below. An alternate explanation may be that individuals that make decisions more quickly may tend to make more mistakes, but are also likely to have more successes in total than those who make decisions and carry them out at a slower rate. Though a statistically well-supported

explanation for this relationship does not emerge from this research study, the link between success and decision making speed is highly interesting and should attract more theoretical and quantitative research in the future.

### **Other Findings**

The finding that intelligence and heuristics use are negatively correlated suggests, as hypothesized, that higher-intellect entrepreneurs use their rational capabilities to cope with the demands of entrepreneurship.

To summarize, this study has broken important new ground in finding that a mentoring relationship is uniquely suited, even more so than education or work experience, to the transmission of useful heuristics to entrepreneurs. This is especially relevant in light of the fact that entrepreneurs are sometimes seen as “lone wolves” who operate independently without the supervision or guidance of another.

Additionally, this study found a correlation between decision making speed, which indicates heuristics use, and subjective and objective forms of career success such as size of firm managed and work satisfaction. These findings represent progress in the field of entrepreneurial cognition and warrant further investigation.

### **Limitations**

The main limitation of this exploratory study seems to be the relatively low sample size. A statistical power analysis performed indicated that the sample size of  $n=64$  was not sufficiently large to establish sufficient power of the results when the relatively low correlation coefficients of some of the variables were taken into account. Response rates for this study were also relatively low. These facts suggest that additional research to replicate the results of this study on a larger sample would be beneficial.

A second limitation of this study is that we posited that more intelligence and experience lead to *more* heuristics use in general, but did not analyze and discuss whether they lead to the use of *better* heuristics. Also, in considering the relationship between heuristics use and entrepreneurial success, it is likely that *better* heuristics, not just *more* heuristics, represent thought processes likely to lead to entrepreneurial success. However, the heuristics use scale developed for this research did not consider heuristics quality. The reasons for this are several. First, this research's heuristics scale already comprised 27 items, and the length of the questionnaire instrument for this research was already fairly long, thus the limits of the attention span of the respondents was of concern. Second, it was more generally beyond the methodological and analytical scope of this paper's design to accommodate hypotheses testing of hypotheses about heuristics quality in addition to those about quantity. Addressing this limitation would be a valuable endeavor for future researchers to take on.

### **Suggestions for Future Research**

The findings of this study suggest a number of intriguing options for future research. First, while mentoring is by no means an overlooked topic in the literature, this study's results suggest that even more attention needs to be directed to the unique properties of mentoring relationships in transferring heuristics from mentor to mentee. The question of what elements are present in business mentoring relationships that are able to transfer useful heuristics where general business experience and business education are lacking is an important one that begs further research investigation.

Second, this study found that the heuristics dimension of decision making speed in particular was correlated with very important result areas: size of firm directed and

career satisfaction. Further investigation into the question of exactly why decision making speed results in entrepreneurs directing larger firms is needed.

As discussed in the results section above, it is unclear why decision making speed results in greater career satisfaction. Possibly there is some unidentified latent variable that links these two variables. Research into what this variable or variables might be would be useful.

Also, future research could investigate if there is a relationship between the specific generic strategies businesses employ such as cost leadership and differentiation, and their principals' use of specific types of specialized heuristics such as financial and marketing related heuristics. Presumably the principals of a firm practicing cost leadership, for instance, would have a sophisticated array of financial related heuristics used to manage the business.

Some other promising research areas that could merit attention are the following:

It would be helpful to analyze exactly what heuristics are most useful to entrepreneurs, and in what contexts they are useful. For instance, some heuristics might be useful within a firm (for such tasks as hiring and staffing), and some in tasks external to the firm (such as applying for a bank loan).

It would also be important to assess whether entrepreneurs who received formal education on entrepreneurship use heuristics more (this study assessed the effects of level of education in general, but not the effects of entrepreneurial education in particular).

If entrepreneurs think differently than corporate managers regarding biases and heuristics, as Busenitz and Barney (1997) have shown, what characterizes the thought processes of entrepreneurs who try to wear the “two hats” of entrepreneur and manager of

their business? Are the most successful entrepreneurial managers those who use heuristics extensively, or those who don't?

While it seems apparent that if specific principles can be abstracted from important entrepreneurial domains and passed on to students, entrepreneurial education will be enhanced, research needs to be done on exactly how useful heuristics can be integrated into current methods of business education, particularly given the findings of this study that there is not a significant correlation between years of business education and use of the various dimensions of entrepreneurial heuristics.

It may also be particularly useful to research the heuristics of “serial entrepreneurs”, those entrepreneurs who repeatedly found businesses, since they are likely to possess a set of proven general heuristics that would be useful for training potential entrepreneurs.

**CHAPTER 2**  
**RESEARCH STUDY 2**  
**A STUDY OF THE FEMALE ENTREPRENEUR IN THE UNITED STATES**

Women's role in entrepreneurship is changing, which is giving birth to a relatively new and underexplored phenomenon: the female serial entrepreneur (SE). Serial entrepreneurs are business owners who have previously started one or more businesses (Wright, Robbie, & Ennew, 1997).<sup>i</sup> This term can encompass individuals who have either closed or sold one or more businesses before starting another business, or are simultaneously operating several businesses; the latter sub-category are also known as "portfolio entrepreneurs" (Carter & Ram, 2003).

Over the past several decades, there has been explosive growth in women-owned businesses. For instance, from 1997-2002, women formed new businesses at twice the national rate (Winn, 2004), and between 1987 and 1994, the number of women-owned businesses grew by 78% (Anna, Chandler, Jansen, & Mero, 1999). In addition, women-owned firms themselves grew at a far faster rate than male-owned firms between 1997 and 2002- 19.8% to 7%. While some researchers summarizing the available evidence have argued that there is little difference between male and female potential or

---

<sup>i</sup> It should be noted that there are other terms used in the literature for the phenomenon this paper calls "serial entrepreneurship", such as "multiple entrepreneurship" (Donckels & Dupont, 1987) and "habitual entrepreneurship" (Westhead & Birley, 1993).

performance in management (Powell, 1990), it is clear that in the entrepreneurial realm, differences in male and female owned firms merit closer attention.

The rapid increase in women owned businesses seems to have resulted in more women becoming SE's. As recently as 1992, scholars such as Kolvereid and Bullvag noted that very few women became SE's (Kolvereid & Bullvag, 1992). Yet data collected for this research from the year 2004 indicated that 36.3% of the 1278 female entrepreneurs in the study were SE's. While the literature on female entrepreneurship in general is extensive, the population of women SE's, to the knowledge of these researchers, has not been studied yet.

Because of the relative newness of the phenomenon of the female SE, our understanding lags current research findings. What is known currently about serial entrepreneurship more generally is primarily based on studies of male SE's. For instance, Wright, Robbie & Ennew (1997) based an article on different types of serial entrepreneurs completely on interview case studies involving a sample of male serial entrepreneurs. There have been large scale studies of serial entrepreneurs such as Westhead & Wright (1998) and Donckels & DuPont (1987), yet the presence of female SE's within these samples were not identified or discussed, perhaps because there were so few female SE's in the samples.

There are, then, gaps in the literature regarding our understanding of the nature of these new female SE's. The first gap is the lack of knowledge of the work habits of these female SE's. Moore (1990) observed that female entrepreneurship in general was transitioning from being a field where women often worked part-time hours to accommodate their child-raising responsibilities to a field in which women were full-time

professionals. This raises the question of whether female SE's are more like male SE's in viewing serial entrepreneurship as a full time pursuit, or more like the typical female non-serial entrepreneur in viewing entrepreneurship as a flexible alternative to a corporate career.

Second, little is known about the nature of the businesses of female SE's. Historically, women traditionally have tended to create smaller businesses than men (Kalleberg & Leicht, 1991). This could be because women have traditionally entered fields such as retail and personal services that on average have smaller business size than businesses in more male-dominated fields such as high technology and construction, because of gender discrimination against women entrepreneurs, because females prefer smaller businesses in general (Cliff, 1998), or for other undetermined reasons. It is not known whether the businesses started by female SE's would be similar to those of female non-serial entrepreneurs in size, or more like the businesses of male entrepreneurs and male SE's.

Another issue for women SE's is the amount of capital they obtain from outside sources. Traditionally, for various reasons, women have found it more difficult to raise capital for their businesses than men. It is worthy of investigation to see whether this pattern holds for female SE's as well, since the ability to acquire more capital potentially opens up more types of businesses for female SE's to invest in beyond the traditionally female business areas of retail and personal services (Greene et al., 2001).

This study, therefore, addresses the gap in knowledge about female serial entrepreneurship by comparing female SE's to female non-serial entrepreneurs (women entrepreneurs who have founded only one venture) and male serial entrepreneurs in hours

worked, business size, and amount of capital invested in their businesses. Data is utilized from the largest United States longitudinal study ever performed of the characteristics of new businesses, and of the entrepreneurs that run them, the Kauffman Firm Survey (KFS) (Ballou & DesRoches, 2009).

This research is the first study to contrast female SE's with other types of entrepreneurs and will enable the researchers to explore whether female SE's represent a truly new breed of female entrepreneur, or whether female serial entrepreneurship is more similar in nature to non-serial female entrepreneurship. It will also extend our understanding of the phenomenon of serial entrepreneurship in general.

Such an analysis seems important and timely given the growing participation of women SE's in entrepreneurship, the growing influence their businesses have on the United States economy, and the increasing influence of serial entrepreneurs in general. For example, Ronstadt (1986), sampled United States college alumni and found that 63% of the currently practicing entrepreneurs and 40% of all ex-entrepreneurs had created more than one venture. Moreover, the female serial entrepreneurs in this study operated a mean number of 1.72 businesses, thus each female serial entrepreneur accounted for as almost as much entrepreneurial activity as 2 female non-serial entrepreneurs, which suggests that female SE's have an impact disproportionately greater than their numbers.

## **Literature Review**

### **Key Findings About Serial Entrepreneurship**

Although the study of serial entrepreneurship is by no means exhausted, much groundwork has been laid. In a survey of 400 Belgian entrepreneurs entitled "Multiple business starters. Who? Why? What?", Donckels & Dupont (1987) examined numerous

demographic aspects of serial entrepreneurs. Through this pioneering research, a clearer picture emerged of serial entrepreneurs, including facts about their social and professional background, education and training, motivations, funding sources, and their likes and dislikes regarding entrepreneurship. Donckels & Dupont concluded that serial entrepreneurs often start businesses in activities they are familiar with, often use family capital to get their businesses started, and begin business activities either in their homes or at rented premises. In the respect of needing to start small or “bootstrap” their businesses, serial entrepreneurs are similar to the larger pool of entrepreneurs in general (Bhide, 1992).

Westhead & Wright (1998) drew a finer-grained picture of serial entrepreneurship by distinguishing between portfolio and non-portfolio serial entrepreneurs. Portfolio entrepreneurs are entrepreneurs who own multiple businesses simultaneously; non-portfolio entrepreneurs are entrepreneurs who start one business, close or sell it, then start another one. They found that a number of differences existed between portfolio and serial entrepreneurs: the age of founders when starting their businesses; parental background; work experiences of the founders; reasons leading to startup; personal attitudes; and the sources of finance used during the business launch period. One of their valuable contributions was demonstrating that not all serial entrepreneurs were alike, that in fact they could be separated into distinguishable groups. Wright, et al. (1997) took this idea even further, classifying serial entrepreneurs as fitting into one of three types: the “venture repeater” (an entrepreneur who undertakes entrepreneurship for defensive reasons), the “organic serial” (an entrepreneur who desires organic, consistent growth for

their firm), and the “serial dealmaker” (the entrepreneur who thrives on business growth through acquisition).

Another major theme that has been explored in the general serial entrepreneurship literature is why, theoretically speaking, entrepreneurs carry out serial entrepreneurship at all. The answers to this question have ranged widely. There is the practical answer of Carter (1999), which is *necessity* (she was studying portfolio entrepreneurship in the farm sector, so it was logical that one farm would reach a natural size limit, then the farm owner would proceed to own a second farm and so forth). Donckels & Dupont (1987) hypothesized that serial entrepreneurship constitutes a kind of risk reduction through the diversification effect of having multiple businesses in different fields. Sarasvathy and Menon (2002) sought to prove mathematically that serial entrepreneurship heightens the ultimate probability of success for entrepreneurs in a field in which there are many failures.

A third area of concern within the serial entrepreneurship literature is the conundrum of why a number of international studies have found that experienced entrepreneurs’ businesses are no more likely to succeed than new ventures launched by novices (Carter & Ram, 2003; Kolvereid & Bullvag, 1992; Li, Schulze, & Li, 2008). Although a number of papers have been written speculating on the causes of the conundrum (Rerup, 2005; Reuber & Fischer, 1999; Starr & Bygrave, 1991), little empirical work has been done to support these conjectures, and a definitive answer to the conundrum may still emerge.

## **Women in Serial Entrepreneurship**

The minimal research on women serial entrepreneurs may be because female serial entrepreneurs have existed in such small quantities that they are difficult to study. To the extent that women have been included in other large scale studies of serial entrepreneurs, their particular characteristics have generally not been separated from the men and studied. This study addresses the problems of sample size through the use of a very large scale longitudinal study of entrepreneurial businesses and the characteristics of their founders of both genders by the Ewing Marion Kauffman Foundation (Ballou & DesRoches, 2009).

## **Women vs. Men in Entrepreneurship in General**

### **Similarities Between Male and Female Entrepreneurs.**

Researchers have found that in some respects, male and female entrepreneurs are similar. Cromie (1987) found that men and women have similar scores on personality variables that are thought to be important reasons for becoming entrepreneurs. For instance, both men and women scored highly on needs for achievement and autonomy. Delving further into the female 'entrepreneurial personality', Chaganti (1986) observed that when traditional personality tests were conducted, no significant differences were found between men and women with regard to achievement motivation, autonomy, persistence, aggression, independence, non-conformity, goal-orientation, leadership, or locus of control.

In some aspects, too, men and women share similar motivations in seeking entrepreneurial work. Birley (1989) pointed out that both men and women shared

motivational aspects such as avoiding low-paid occupations, escaping supervision, and avoiding the constraint of subservient roles.

Also, male and female entrepreneurs share certain background attributes. These include sibling position (frequently, both male and female entrepreneurs are either the firstborn or only child in their family), fathers' occupations, and general level of education (Anonymous, 1995).

Finally, Kallenberg and Leicht (1991) found that female entrepreneurs were not more likely than male entrepreneurs to go out of business during their study's time period, nor was there a difference in earnings growth in male and female businesses during the period they studied.

#### **Differences Between Male and Female Entrepreneurs.**

Yet, despite the similarities between male and female entrepreneurs, there are also a significant number of differences. Historically, men and women have tended to enter different occupational fields, and some of these differences seem to persist today. Many women-owned businesses, for instance, are in either the retail industry or the service industry (Rae & Carswell, 2000) and their employment statistics may disproportionately reflect the economic performance of these sectors.

Next, traditionally, women have had fewer entrepreneurship role models than men. Social learning theory (Lerner, Brush, & Hisrich, 1997) implies that having role models is very useful for potential entrepreneurs, and the lack of such role models may be a reason why there were traditionally less women entrepreneurs than male ones. Now that more women are entering entrepreneurship, however, this situation may remedy itself.

Women also have less diversified business experience. Female entrepreneurs have less industry, management, and prior business start-up experience than men (Kalleberg & Leicht, 1991). While prior business start-up experience has generally not been found to contribute to entrepreneurial success (Kolvereid & Bullvag, 1992; Reuber & Fischer, 1999), prior industry experience has been found to be a significant factor that affects start-up success (Bruderl, Preisendorfer, & Ziegler, 1992).

Perhaps the biggest difference between women and men in terms of entrepreneurship is the effect of family responsibilities on women entrepreneurs. Many women have become entrepreneurs to deal with “organizational rigidity” (Vinnicombe, 1987) that makes it impossible for them to simultaneously raise a family and follow their career preference. One researcher found that only 39% of female executives choose to be mothers, versus the entrepreneurial women in their study, of which 74% are mothers (Hertz, 1986). Although generally speaking men have been sharing family care duties more in recent years, women still play the role of principal family caregiver (Bardoel, Tharenou, & Ristov, 2000).

Because of the need to take care of families, some motivations for entering into self-employed entrepreneurship differ. A higher proportion of women have traditionally become entrepreneurs to balance work and family, while a higher proportion of men who aspire to be entrepreneurs seek wealth creation and/or economic advancement (Geoffee & Scase, 1983). The flexibility of an entrepreneurial career has been important to women who have not yet married, and this flexibility has traditionally become even more important once they marry and have children.

Chaganti (1986) identified a “feminine mode” of business management where the CEO has modest profit goals, the primary interest in running the business was personal satisfaction, and the CEO/owner out of choice preferred the business to remain small. The female business owner, having a typically hard time raising capital (perhaps because of inexperience or gender discrimination) enters low-capital businesses. The staff of the typical “feminine” business remains small, and growth remains relatively low. The well known cosmetics company “The Body Shop”, founded by entrepreneur Anita Roddick, had its beginnings as a typically feminine business, though the founder went on to grow the company on a giant scale.

Some studies have suggested that women’s businesses underperform those of men (Brush, 1992; Rosa, Carter, & Hamilton, 1996) and labeled this phenomenon the “female underperformance hypothesis” (Du Rietz & Henrekson, 2000). There is detailed evidence too that women-owned businesses tend to be smaller than male-owned businesses (Cliff, 1998), although the relationship between smaller size and reduced profit has not been demonstrated.

### **Theory and Hypotheses Development**

The following section develops three hypotheses about female SE’s that subsequently will be tested.

#### **Time Demands of Serial Entrepreneurship**

##### **Time Demands of Female SE’s versus Female non-SE’s.**

Historically, women have often entered the realm of entrepreneurship to maintain a balance between work and family life. Whereas some forms of entrepreneurship might offer women the ability to work an unstructured schedule or take off time when they

wish, serial entrepreneurship on the whole would seem to be quite demanding in terms of time requirements, particularly portfolio entrepreneurship.

To to the extent that women entrepreneurs are transitioning to become “modern entrepreneurs”, as discussed by Moore (1990), some of the women previously attracted to the moneymaking aspect of corporate life who are willing to postpone having a family might find serial entrepreneurship attractive, since it offers them self-determination and freedom as well as significant financial benefits. Such “modern entrepreneurs”, who view entrepreneurship as a primary career, sometimes work in male dominated fields, and often come from a background skilled in business, will probably be more willing to accept the heavy time demands serial entrepreneurship requires than female non-SE’s.

The above discussion leads us to Hypothesis 1a:

*Hypothesis 1a: Female SE’s will invest more working hours in their businesses than female non-SE’s.*

#### **Time Demands of Female SE’s versus Male SE’s.**

Neoclassical economic models predict the amount of time that people will spend at work by comparing the value of their “home time” (domestic demands) versus the wage they can earn in the labor market (Whinston & Green, 1995). This model has been successfully applied to the situation of women by research such as that done by Coverman (1983) and Hersch and Stratton (1997), which found that housework and hourly earnings are negatively correlated.

Thus, the question of whether women serial entrepreneurs will work comparative hours to men depends, among other things, on the type of earnings they can expect from their businesses, as well as their choice about having children.

In sum, the question of work hours really is at heart a question of whether today's female SE's are 1950's style "feminine" entrepreneurs or "modern" professional businesswomen, who enter entrepreneurship as a full time career and are ready to sacrifice having children to attain the rewards of this life. In this respect such women would have more in common with the typical Fortune 500 woman executive than the woman entrepreneur of the recent past. For such women, the rewards of serial entrepreneurship will be very high, since successful serial entrepreneurs may succeed in attaining great wealth. Since a significant amount of women have demonstrated that they are willing to sacrifice their childbearing opportunities to climb the proverbial corporate ladder, it would not be surprising to see that as more opportunities open up to women to carry out serial entrepreneurship, more of the women in the corporate mode would take advantages of opportunities as serial entrepreneurs and forsake childbearing and rearing opportunities to do so.

It is expected that whether serial entrepreneur career paths are those of the serial entrepreneur or of the portfolio entrepreneur, either path would entail a great deal of time invested. It seems logical that women who realize the significant time commitments of being a serial entrepreneur will accept those commitments before they take on the responsibilities of their multiple businesses and be prepared to work such long hours.

The preceding observations lead to:

*Hypothesis 1b: Female SE's will work statistically indistinguishable hours from male SE's.*

It should be noted that the KFS data utilized for this study does not allow for a statistical distinction to be made between sequential SE's (those SE's who only operate

one business at a time) and portfolio SE's (those who operate multiple businesses at the same time). It seems likely that entrepreneurs running a portfolio of businesses would work longer weekly hours than the sequential SE who only runs one business.

Unfortunately, the data collected for this study does not allow us to separate these two groups of SE's for separate statistical analysis. Those who wish to do further research in the serial entrepreneurship field should strive to collect data on the different types of serial entrepreneurs so that such fine distinctions can be made in analysis.

### **Amount of capital that SE's receive to invest in their businesses**

In a study of the funding of female entrepreneurs, Verheul and Thurik (2001) found that female entrepreneurs typically have a smaller amount of start-up capital than men. One reason for such a finding may be simply that women have traditionally held less wealth than men. Another potential reason is discrimination, although Buttner and Rosen (1989) concluded that there was no discrimination in their study of bank funding decisions for female applicants. Coleman (2000) argued that lenders favored men over women, but that this favoritism was based on the legitimate factor that male-owned businesses were typically larger than female-owned ones.

Another reason that women have traditionally deployed less capital than men may be that their businesses have often been in the services and retail sectors, which require less startup capital than businesses such as high-technology firms and construction companies, more traditionally male domains. This was the principal finding of the study by Greene, Brush, Hart & Saporito (2001), who concluded that women in more recent years have continued to stay in industries which were less desirable to venture capitalists to fund. They believed that this industry choice effect was the reason that a disparity of

business venture capital funding continues to exist despite the increased percentage of women in entrepreneurship overall.

Female SE's, by virtue of their greater experience as entrepreneurs, might be likely to have more access to capital than female non-serial entrepreneurs. They might be able to rely on funding sources that helped them fund prior businesses. They might have a greater amount of industry contacts that could lead them to be able to win funding for their businesses. Also, having built up a positive track record would seem to enable them to be able to solicit more capital from potential funders. These points suggest:

*Hypothesis 2a: Female SE's will receive more capital to invest in their businesses than female non-SE's.*

Women SE's, by virtue of their larger business sizes than women non-SE's, industry contacts amassed during their careers, and track record of success, might be expected to rival male SE's in their ability to amass capital to grow their businesses. This expectation leads us to postulate:

*Hypothesis 2b. Women serial entrepreneurs will receive indistinguishable amounts of capital to invest in their businesses than male serial entrepreneurs.*

### **Size of Businesses of Serial Entrepreneurs**

It is an established finding in the general entrepreneurial literature that women's businesses are typically smaller sized than those of men (Cliff, 1998; Kalleberg & Leicht, 1991), whether that size is measured by gross revenues, number of employees, or level of profit. There is also some evidence that these women-owned businesses grow less quickly than those owned by men (Cooper, Gimeno-Gascon, & Woo, 1994).

Research has been done into the sources of male-female business size differentials. One hypothesis that has been explored is that men and women value business growth differently due to variations in early and ongoing socialization processes. Men possess and value qualities such as self-assertion, and the urge to master, whereas women are expected to have high level of communal qualities such as selflessness, a concern for others, and interpersonal sensitivity.

Consequently, men and women may view business growth differently. Men may view business growth as a sign of business success and mastery, whereas women may place more emphasis on a range of performance measures without placing special emphasis on growth (Eagly & Wood, 1991). In fact, Brush (1992) noted that women tend to pursue a balance between economic goals, such as profit and growth, and noneconomic goals, such as product quality, personal enjoyment, and helping others.

A second reason that female businesses tend to be smaller than male businesses may be that women feel comfortable with a lower level of growth than men. Many female business owners interviewed in one study were believed to be reluctant to expand beyond a certain point since “business growth would create demands on their time and life-styles which would threaten the pattern of family and conjugal relationships”(Goffee & Scase, 1985, p. 22) . Cliff expressed this notion of setting mental limits to growth such:

“It appears that many entrepreneurs express a desire to stop growing upon attaining the maximum business size threshold that they have established for the enterprise. The threshold represents the optimum or ideal size that the entrepreneur is comfortable managing—the size that allows them to

maintain control over the organization, requires a reasonable amount of time or energy, and/or permits them to achieve a balance between work and personal life.”(Cliff, 1998, p. 536)

The question is whether these observations would tend to hold true for women SE’s as well as women non-SE’s. It might be hard for women entrepreneurs to achieve success as serial entrepreneurs if they did not place a high value on marks of success such as business size and growth, unlike female non-serial entrepreneurs. Providers of capital to female SE’s, for instance, would probably place a high value on signals that the female SE’s were willing to run high-growth businesses, and were capable of running them. Also, since they may be more skillful businesspeople than non-SE’s due to their greater experience, the mental threshold size of businesses that female SE’s feel comfortable managing may be higher than the mental threshold of female non-SE’s.

Therefore, since female SE’s are expected to be similar to male SE’s, it is expected that women serial entrepreneurs will run businesses that are larger than those of female non-SE’s, and comparable in size to those of male SE’s.

These observations lead to the following hypotheses:

*Hypothesis 3a. Female SE’s will run larger businesses than female non-SE’s.*

*Hypothesis 3b. Female SE’s will run businesses that are of statistically indistinguishable sizes from those of male SE’s.*

### **Methodology**

The hypotheses for this paper are tested on secondary data from the KFS, the largest longitudinal study ever performed of new United States businesses and the owner

characteristics of these businesses. This study was carried out by the Ewing Marion Kauffman Foundation. The KFS data was gathered using a random sample from Dun & Bradstreet's database list of approximately 250,000 new businesses started in 2004 in the United States, and the KFS researchers followed the progress of these businesses and their owners longitudinally each year through the year 2007. The businesses that the KFS included in its sample were businesses that were new business starts, purchases of existing businesses by a new owner or owners, and the franchise purchases. The KFS collected data on topics including business characteristics, business strategy and innovation, business organization and HR benefits, business finances, and the demographics of the owners. Particularly relevant to this study were questions on how many businesses the owners had started (the owners' participation in serial entrepreneurship) and the gender and characteristics of these owners.

The large scale nature of the KFS study is highly relevant here since possibly one of the major reasons that little work has been done on women serial entrepreneurs is the difficulty of obtaining a critical mass of women serial entrepreneurs to study.

The KFS represents a random sample of 32,469 businesses taken from Dun & Bradstreet's database list of new businesses started in 2004. A total of 17,258 businesses were screened for eligibility, resulting in the identification of 6,030 eligible businesses. This comprised a 35% eligibility rate. Interviews were completed in 2005 with the principals of 4,928 businesses that started operations in 2004, who were interviewed by telephone and paid \$50 to complete the survey. Interviews were carried out in each of the subsequent 3 years with the principals from the businesses from the initial KFS sample that remained in business and that agreed to be re-interviewed. The statistics

performed in the following analysis represent statistics collected for the first year of the study unless otherwise indicated.

### **Analyses and Results**

The statistical software SPSS Version 17 was used to run all statistical tests.

Because the majority of the variables in this data set were ordinal scaled, a typical chart of means and standard deviations cannot be generated. Also for this reason, it is not possible to present exact statistics such as precisely how many hours female SE's worked on average per week versus female non-SE's or versus male SE's. Alternatively, the following frequency table (Table 6) is presented.

Table 6

*Frequency table for selected variables, KFS Participants*

---

Variable
Gender
Male
Female
Missing
TOTAL
Breakdown of total novice vs. serial entrepreneurs in data set
Novice Entrepreneur
Serial Entrepreneur
Missing
Breakdown of serial entrepreneurs by gender
Male serial
Female serial
Total Hours Worked Per Week
Less than 20
20-35
36-45
46-55
56-65
66+
Total Revenue
Don't know/refused
\$500 or Less
\$501 - \$1,000
\$1,001 - \$3,000
\$3,001 - \$5,000
\$5,001 - \$10,000
\$10,001 - \$25,000
\$25,001 - \$100,000
\$100,001 - \$1,000,000
\$1,000,000 or More
Number of employees
0
1
2
3
4
5
6+

---

Among the 2087 serial entrepreneurs identified in the first year (“baseline”) KFS data, 464 were female serial entrepreneurs. Thus, 36.3% of all of the female entrepreneurs in the study were serial entrepreneurs. 22.2% of all of the serial entrepreneurs in the study were female and 77.7% of all serial entrepreneurs in the study were males.

Hypothesis 1a posited that Female SE’s will invest more working hours in their businesses than female non-SE’s. Hours worked were collected as ordinal data in the KFS, therefore a Mann-Whitney test was the appropriate statistical analysis to apply in this case. The Mann-Whitney test was conducted. This hypothesis was not supported by the data. The findings were that female SE and female non-SE groups worked statistically indistinguishable amounts of hours. The mean rank of the two groups was 613.04 for female non-serial entrepreneurs to 645.88 of female HE’s, p value of .115. See Tables 7 and 8 below.

Table 7

*Mean & Sum of Ranks for Hours Worked Per Week by Group*

Group	N	Mean Rank	Sum of Ranks
Female Non-Serial Entrepreneur	794	613.04	486,750.00
Female Serial Entrepreneur	455	645.88	293,875.00

Table 8

*Mann-Whitney for Hours Worked Per Week by Group*

Statistic	Value	Sig.
Mann-Whitney U	171,135.000	.115

Hypothesis 1b suggested that women and male serial entrepreneurs will work statistically indistinguishable hours. Hours worked were collected as ordinal data in the KFS, therefore a Mann-Whitney test was the appropriate statistical analysis to apply in this case. The Mann-Whitney test was conducted. The findings were that male SE's worked longer hours than female SE's (mean rank 1045 to 943) by a highly statistically significant margin ( $p < .001$ ). Tables 9-10 follow.

Table 9  
*Mean & Sum of Ranks for Hours Worked Per Week by Group*

Group	N	Mean Rank	Sum of Ranks
Male Serial Entrepreneur	1589	1045.34	1,661,043.00
Female Serial Entrepreneur	455	942.74	428,947.00

Table 10  
*Mann-Whitney for Hours Worked Per Week by Group*

Statistic	Value	Sig.
Mann-Whitney U	325,207.000	.001

Hypothesis 2a suggested that female SE's will receive more capital to invest in their businesses than female non-SE's. "Capital to invest" was operationalized separately first as total debt borrowed by the business by its owners in the first "baseline" year of the KFS, and second as total outside equity investments in the owner's business in the baseline year of the KFS.

To test this hypothesis, a Mann-Whitney non parametric test was conducted on the females in the data set with serial entrepreneur or non-serial entrepreneur as the independent variable, and total debt and total equity invested, the dependent variables. A non parametric test was appropriate to use here because total equity invested was collected as ordinal data in the KFS. To control for industry effects, the Mann-Whitney test was conducted not on the data as a whole, but on several NAICS industry code subsectors. The first subsector selected was NAICS sector 54, which represents professional, scientific and technical services. It was chosen because it was a very frequently occurring type of business in the data, and therefore was likely to reveal statistically significant results. The second subsector chosen was NAICS sector 33, which comprises general manufacturing businesses. This sector was chosen because of its high frequency in the data, and also to give representation to a different type of industry than the service industry. The findings differed in the two sectors chosen. Regarding debt borrowed, for NAICS sector 54 businesses, female SE's borrowed significantly more debt than female non-SE's (mean rank 154.95 to 136.53,  $p=.049$ ), however for sector 33 businesses female SE's did not borrow a statistically significant amount of more debt than female non-SE's. Regarding equity capital raised, there were not significant differences between the two groups in either NAICS industry code 54 or NAICS industry code 33. See the following tables 11-18.

Table 11

*Mean & Sum of Ranks for Hypothesis 2a, Total Debt Investments Solicited, NAICS Industry Code 54- Professional, Scientific, and Technical Services*

Group	N	Mean Rank	Sum of Ranks
Female Non-serial Entrepreneur	192	136.53	26214.50
Female Serial Entrepreneur	92	154.95	14255.50

Table 12

*Mann-Whitney for Hypothesis 2a, Debt Invested by Female SE/Non SE, NAICS Industry Code 54.*

Statistic	Value	Sig.
Mann-Whitney U	7686.500	.049

Table 13

*Mean & Sum of Ranks for Hypothesis 2a, Total Debt Investments Solicited, NAICS Industry Code 33- Manufacturing Businesses*

Group	N	Mean Rank	Sum of Ranks
Female Non-serial Entrepreneur	52	45.38	2360.00
Female Serial Entrepreneur	35	41.94	1468.00

Table 14

*Mann-Whitney for Hypothesis 2, Debt Invested by Gender*

Statistic	Value	Sig.
Mann-Whitney U	838.000	.519

Table 15

*Mean & Sum of Ranks for Hypothesis 2a, Total Equity Investments Solicited, NAICS Code 54-Professional, Technical and Scientific Services*

Group	N	Mean Rank	Sum of Ranks
Female Non-serial Entrepreneur	192	137.39	26379.50
Female Serial Entrepreneur	92	153.16	14090.50

Table 16

*Mann-Whitney for Hypothesis 2a, Equity Invested, Female SE/non-SE*

Statistic	Value	Sig.
Mann-Whitney U	7851.500	.126

Table 17

*Mean & Sum of Ranks for Hypothesis 2a, Total Equity Investments Solicited, NAICS Code 33-Manufacturing*

Group	N	Mean Rank	Sum of Ranks
Female Non-serial Entrepreneur	52	45.38	2360.00
Female Serial Entrepreneur	35	41.94	1468.00

Table 18

*Mann-Whitney for Hypothesis 2a, Equity Invested, Female SE/non-SE, NAICS Code 33- Manufacturing*

Statistic	Value	Sig.
Mann-Whitney U	848.500	.591

Hypothesis 2b suggested that female SE's will receive an indistinguishable amount of capital to invest in their businesses versus male SE's. To test this hypothesis, as in Hypothesis 2a, capital invested was operationalized both as total debt borrowed and total equity raised in the entrepreneurs' businesses. Mann-Whitney non parametric tests were conducted with gender as the independent variable and total equity invested as the dependent variable. In order to control for industry effects, these statistical tests were conducted not on the sample as a whole, but on subsamples. As in Hypothesis 2a, NAICS industry codes 54 and 33 were selected for analysis because of their prevalence in the overall sample and because they represented two relatively dissimilar industries. The findings suggested that male serial entrepreneurs raise more equity than female serial entrepreneurs in the professional, scientific and technical services industry (mean rank of 237.70 to 209.02,  $p=.063$ ), but that the amount of equity raised is indistinguishable between the two groups in the manufacturing industry (mean rank of 161.00 to 138.43,  $p=.163$ ). Regarding debt borrowed, the two entrepreneur groups did not differ significantly in either of the two NAICS industries analyzed. See the following tables 19-26.

Table 19. *Mean & Sum of Ranks for Hypothesis 2b, Debt Borrowed by Entrepreneur Type, NAICS Code 54 Businesses (Professional, Scientific and Technical Service Businesses):*

Group	N	Mean Rank	Sum of Ranks
Male Serial Entrepreneur	372	230.77	85847.50
Female Serial Entrepreneur	92	239.48	22032.50

Table 20. *Mann-Whitney for Hypothesis 2b, Debt Borrowed by Entrepreneur Type, NAICS Code 54 Businesses (Professional, Scientific and Technical Service Businesses)*

Statistic	Value	Sig.
Mann-Whitney U	85847.500	.541

Table 21. *Mean & Sum of Ranks for Hypothesis 2b, Debt Borrowed by Entrepreneur Type, NAICS Code 33 Businesses (Manufacturing Businesses):*

Group	N	Mean Rank	Sum of Ranks
Male Serial Entrepreneur	282	160.09	45144.00
Female Serial Entrepreneur	35	150.26	5259.00

Table 22. *Mann-Whitney for Hypothesis 2b, Debt Borrowed by Entrepreneur Type, NAICS Code 33 Businesses*

Statistic	Value	Sig.
Mann-Whitney U	4629.000	.532

Table 23. *Mean & Sum of Ranks for Hypothesis 2b, Equity Raised by Entrepreneur Type, Businesses in NAICS code 54 (Professional, Scientific, and Technical Services).*

Group	N	Mean Rank	Sum of Ranks
Male Serial Entrepreneur	371	237.70	88186.00
Female Serial Entrepreneur	92	209.02	19230.00

Table 24. *Mann-Whitney for Hypothesis 2b, Equity Raised by Entrepreneur Type, NAICS code 54*

Statistic	Value	Sig.
Mann-Whitney U	14952.00	.063

Table 25. *Mean & Sum of Ranks for Hypothesis 2b, Equity Raised by Entrepreneur Type, Businesses in NAICS code 33 (Manufacturing Businesses).*

Group	N	Mean Rank	Sum of Ranks
Male Serial Entrepreneur	281	161.00	45241.00
Female Serial Entrepreneur	35	138.43	4845.00

Table 26. *Mann-Whitney for Hypothesis 2b, Equity Raised by Entrepreneur Type, NAICS code 33*

Statistic	Value	Sig.
Mann-Whitney U	14952.00	.163

Hypothesis 3a suggested that female SE’s will run larger businesses than those of female non-serial entrepreneurs. The third follow-up year of the longitudinal KFS data was utilized, so that the businesses would be given time to grow before results were analyzed. To test Hypothesis 3, business size was operationalized as total revenues achieved in the third follow-up year of the KFS study. It was not possible to control for industry as in a regression analysis, or to calculate exact business growth rates, since business size, operationalized as business revenues, was non-parametric data. Therefore, industry was controlled as in the analysis for Hypothesis 2 above for by analyzing two industry subsamples, NAICS codes 54 and 33. To test business size, several Mann-Whitney tests were conducted. The Mann-Whitney was appropriate since the KFS data for revenues was collected in ordinal form. Gender was the independent variable and total revenues was the dependent variable. By the third follow-up year of the KFS, the businesses in the study had undergone some attrition due to business failure and refusal to

take the follow-up studies, so that there remained 457 female non-serial entrepreneurs and 270 female serial entrepreneurs. This attrition reduced the size of the subsamples analyzed as well. Of the remaining entrepreneurs in the scientific, professional and technical services industry, the female SE's were found to run significantly larger businesses than the female non-SE's, with a significant p value of .05. However, in NAICS industry 33, manufacturing, female SE's and non-SE's were not found to differ significantly with regard to business size (as measured by revenues).

The results are displayed in the following Tables 27-30.

Table 27. *Mean & Sum of Ranks for Business Size, Female SE vs Female non-SE, NAICS code 54 (scientific, professional and technical services).*

Group	N	Mean Rank	Sum of Ranks
Female Non-serial Entrepreneur	118	82.44	9728.50
Female Serial Entrepreneur	56	98.15	5496.50

Table 28. *Mann-Whitney for Business Size, Female SE vs. Female non-SE, NAICS code 54*

Statistic	Value	Sig.
Mann-Whitney U	2707.500	.05

Table 29. *Mean & Sum of Ranks for Business Size, Female SE vs Female non-SE, NAICS code 33 (manufacturing businesses)*

Group	N	Mean Rank	Sum of Ranks
Female Non-serial Entrepreneur	33	23.33	770.00
Female Serial Entrepreneur	17	29.71	505.00

Table 30. *Mann-Whitney for Business Size, Female SE vs. Female non-SE,*

*NAICS code 33*

Statistic	Value	Sig.
Mann-Whitney U	209.000	.134

To test Hypothesis 3b, an analysis was performed to see if male and female SE's differed on business size. Business size was operationalized as revenues attained. The year chosen was follow-up year 3 of the Kauffman Firm Survey, to allow sufficient time for the businesses to grow. In this year, 983 of the male-founded businesses and 270 of the female-owned businesses remained in the study, the attrition being due to business failure and refusal to take the follow-up surveys. A Mann-Whitney test was conducted on the sample's population of serial entrepreneurs, which was appropriate since the KFS data for revenues was collected in ordinal form (it was not possible to control in the traditional sense for initial size of the businesses, or to calculate exact growth rates in revenues, since the data on revenues in this study was in non-parametric form). The tests were conducted on NAICS industry segments 33 and 54 to control for industry effects. Gender was the independent variable and total revenues the dependent variable. The findings from these Mann-Whitney tests revealed that male serial entrepreneur founded businesses were not significantly of different sizes than the female serial entrepreneur founded ones. Thus, Hypothesis 3b was supported. Refer to the following Tables 31-34.

Table 31. *Mean & Sum of Ranks for Business Size, Male SE vs. Female SE, NAICS code 54*

Group	N	Mean Rank	Sum of Ranks
Male Serial Entrepreneur	257	160.02	41126.00
Female Serial Entrepreneur	56	143.13	8015.00

Table 32. *Mann-Whitney for Business Size, Male SE vs. Female SE, NAICS code 54*

Statistic	Value	Sig.
Mann-Whitney U	6419.000	.192

Table 33. *Mean & Sum of Ranks for Business Size, Male SE vs. Female SE, NAICS code 33*

Group	N	Mean Rank	Sum of Ranks
Male Serial Entrepreneur	169	94.57	15982.50
Female Serial Entrepreneur	17	82.85	1408.50

Table 34. *Mann-Whitney for Business Size, Male SE vs. Female SE, NAICS code 33*

Statistic	Value	Sig.
Mann-Whitney U	1255.500	.373

## Discussion

An important conclusion that emerges from this research is that female SE's are different in important aspects of business practice from female non-SE's. Female SE's run larger businesses than female non-SE's, achieving this by borrowing greater amounts

of money than female non-SE's. These findings suggest that female SE's make use of their greater business experience and past successes to run larger and better funded businesses than female non-SE's. Interestingly, female SE's achieve these better results while working statistically indistinguishable hours than female non-SE's.

This research also finds that, regarding business size as measured by revenues, female SE's have grown their businesses to a statistically indistinguishable level when compared to the businesses of male SE's in both service and manufacturing related businesses. This important finding suggests that, as hypothesized, female SE's have progressed significantly in rivaling the achievements of male SE's. They have done this even while working less hours on average than male SE's.

The shorter hours that female SE's seem to work from male SE's might indicate that family issues are still an important concern and a source of diversion from work effort for the female SE's.

The fact that female SE's utilized more debt than female non-SE's may indicate that female SE's were attempting to build larger businesses than female non-SE's, and therefore needed more financing to fund these larger businesses. Male SE businesses were found to be more likely than female SE businesses to raise capital in the professional, technical and scientific services industry, perhaps suggesting discrimination against female SE's, or more experience on the part of male SE's in raising capital. In response to their difficulties raising capital, woman SE's borrowed more, which is indicated by the finding that male and female SE borrowing levels were similar.

It is unclear why male SE's in sector 54, the professional, technical and scientific services industry, raise more equity than female SE's in that industry, whereas in the diversified manufacturing industry these two groups raise similar levels of equity.

In sum, female SE's in the services sector represent a higher-achieving group than female non-SE's in that sector. However, it seems likely that female SE's still bear some of the family responsibilities that women non-SE's have traditionally shouldered. Despite their family responsibilities, however, the business performance of female SE's, generally speaking, has grown to rival that of male SE's.

### **Public Policy Implications and Future Research**

This study suggests a number of public policy implications. Since female SE's are a particularly high achieving group in the sense that they run larger businesses than female non-SE's, government policy should target resources to them in particular. It may be of special interest to public policy that female SE's would create more jobs than female non-SE's, given that they are running multiple businesses and that these businesses are larger in size than the typical female entrepreneurial business.

The results of this study indicate that female SE's may still be hindered in their wealth creation efforts by the need to spend time raising children, as indicated by the finding that female SE's work fewer hours than male SE's. Public policy towards female SE's therefore should be directed at helping female SE's with their domestic responsibilities, perhaps by subsidizing daycare for female SE's or by providing some such similar type of help.

It would be helpful for further research to obtain data on the family lives of women serial entrepreneurs, to see if the lesser time involvement they seem to have in

serial entrepreneurship than men is a result of them spending more time with their children and home life, or whether this lesser involvement is a result of other causes, such as simply desiring to spend less time working.

## CHAPTER 3

### RESEARCH STUDY 3

#### THE SERIAL ENTREPRENEUR DILEMMA: WHY SERIAL ENTREPRENEURS DON'T OUTPERFORM NOVICE ENTREPRENEURS

A small but significant body of research reviews the performance and habits of serial entrepreneurs. Serial entrepreneurs are business owners who have previously started one or more businesses (Wright, Robbie, & Ennew, 1997).<sup>ii</sup> This term can encompass individuals who have either closed or sold one or more businesses before starting another business, or are simultaneously operating several businesses; the latter sub-category are also known as “portfolio entrepreneurs” (Carter & Ram, 2003). Serial entrepreneurs are relatively prevalent, which suggests their importance to the field of entrepreneurship in general. For instance, Scholhammer (1991) in a study of 138 entrepreneurs found that 51% of respondents contributed to the initiation of 2 or more businesses (Schollhammer, 1991). Similarly, Ronstadt (1986) in a large sample of US college alumni found that 63% of the currently practicing entrepreneurs and 40% of all ex-entrepreneurs had created more than one venture.

---

<sup>ii</sup> It should be noted that there are other terms used in the literature for the phenomenon this paper calls “serial entrepreneurship”, such as “multiple entrepreneurship” (Donckels & Dupont, 1987) and “habitual entrepreneurship” (Westhead & Birley, 1993).

A fascinating conundrum is posed by research findings which have consistently shown that when groups of serial entrepreneurs are compared to groups of novice entrepreneurs, the businesses of the more experienced entrepreneurs *do not outperform the novices' businesses*, in more numerous employees, in greater earnings, or in longer survival times. This paper terms this observation the “serial entrepreneur dilemma.” Table 35 provides a comprehensive summary of these studies.

Table 35. *Studies and reviews that discuss the failure to show a difference between experienced and novice entrepreneurs in the area of business performance*

Study	Findings
(Westhead & Birley, 1993)	The number of employees in businesses established by novices and those founded by serial entrepreneurs in Great Britain were not statistically different. Nor was “wealth creation” greater in businesses started by serial entrepreneurs.
(Kolvereid & Bullvag, 1992)	In a study of Norwegian firms, they failed to find support for the assumption that experienced business founders were more successful than their novice counterparts.
(Westhead & Wright, 1998)	Their study comprised 621 owners-managers of businesses in Great Britain. No significant performance differences between novice and serial entrepreneurs were found. “There would therefore appear to be scope for <i>large scale research</i> (emphasis added) that examines carefully the relative importance of different assets and liabilities of previous entrepreneurial experience.” (199)
(Reuber & Fischer, 1999)	In a qualitative article, they concluded that a consistent relationship between experience of management team and performance of the venture they head has never been found. Yet they still believed that experience must play an important role in entrepreneurship.
(Van Praag, 2003)	Using a survival analysis methodology, they found that experience in self-employment does not significantly influence the length of a business venture, or alter the hazard rate or rate of compulsory exit.
(Bruderl, et al., 1992)	Using a survival analysis methodology on German data, they discovered contradictory results regarding a comparison of experienced and inexperienced entrepreneurs.
(Li, et al., 2008)	Using a sample of 440 Chinese entrepreneurs, found that experienced Chinese entrepreneurs do not demonstrably achieve higher levels of venture performance than novices.

As Table 35 suggests, the “serial entrepreneur dilemma” has held up consistently in quantitative research performed over the past two decades, spanning a variety of countries. Kolvereid and Bullvag (1992) and Westhead and Birley (1993) were among the earliest researchers to document this phenomenon. Since then a number of studies have upheld these results, the most recent Li, et al. (2008) in a study of Chinese entrepreneurs. Interestingly, recent research has also found that established, experienced firms, as well as individual entrepreneurs, may not have a greater probability of survival than new firms once strategy is controlled for, when the two are using different modes of foreign entry (sequential versus an international new venture) (Mudambi & Zahra, 2007).

The consistency and implausibility of these findings are so remarkable that researchers assessing this phenomenon have developed a variety of ideas to explain the results (Bruderl, Preisendorfer, & Ziegler, 1992; Rerup, 2005; Starr & Bygrave, 1991). Yet no scholarly consensus has emerged to conclusively explain the cause of this puzzle and the corresponding “gap” in the literature on serial entrepreneurship. This study endeavors to fill this gap in understanding by presenting and empirically testing a set of hypotheses to explain why serial entrepreneurs’ businesses do not typically outperform novice entrepreneurs’ businesses.

The implications of the serial entrepreneur/novice entrepreneur puzzle are very important, especially in light of the literature on entrepreneurial learning. Much of the literature on entrepreneurial learning is theoretical in nature (Cope, 2005; Rae, 2005), and seems to assume that general theories of learning apply to entrepreneurs. The evidence from serial entrepreneurship suggests that this may be a faulty assumption.

The serial entrepreneur conundrum touches other areas of entrepreneurship debate as well. Consider for instance the debate over the “traits” approach to entrepreneurship. The “traits” approach generally suggests that an ideal “entrepreneurial personality” exists which consists of a number of traits beneficial to entrepreneurship which cannot be taught or altered (Deakins & Freel, 1998). If this approach is correct, a group of proven serial entrepreneurs, who are more likely to possess such traits than a group of novice entrepreneurs, should outperform the novices. Yet, apparently, the serial entrepreneurs do not.

This article uses an empirical approach, which differs from previous largely qualitative studies. Extant research to date on serial entrepreneurship has explored the phenomenon in a variety of international settings (Carter, 1999; Donckels & Dupont, 1987; Kolvereid & Bullvag, 1992; Li, et al., 2008; Pasanen, 2003; Rosa & Scott, 1999; Ucbasaran, Wright, & Westhead, 2003; Westhead & Birley, 1993; Westhead & Wright, 1998); this study uses a dataset from a large scale study of new U.S. businesses and the characteristics of their owners.

### **Literature Review**

A number of researchers have previously attempted to address the issue of why experienced serial entrepreneurs do not exhibit better venture performance than novices. The following review summarizes the explanations that have been suggested to explain this conundrum.

#### **Starr and Bygrave’s Five Explanations For the Serial Entrepreneur Dilemma**

Starr and Bygrave (1991), using a methodology involving the analysis of case studies of famous technology entrepreneurs, pointed out that the experience that serial

entrepreneurs acquire has both positive and negative aspects to it. On the positive side, they observed, serial entrepreneurship experience has the possibility of conferring wisdom on entrepreneurs. Serial entrepreneurs tend to be able to build up a network of relationships in their experience which they may be able to successfully call upon in the course of starting and managing future ventures. Also, successful serial entrepreneurs may emerge from their ventures with a positive reputation which can help them more quickly and successfully acquire funding and other benefits for their additional ventures.

However, Starr and Bygrave observed that the negatives of past venture experience may well outweigh the positives, thus causing the “serial entrepreneur dilemma”. They enumerated five ways in which past venture experience can hurt serial entrepreneurs. These are: the emergence of “blind spots”, the “liability of staleness”, the “liability of sameness”, the “liability of priciness”, and the “liability of costliness.”

Arguing for the presence of serial entrepreneur “blind spots”, Starr and Bygrave cited research by Boeker (1989) which suggested that entrepreneurial founders favored their functional background while formulating strategy for their ventures, whether this background was research and development, sales and marketing, or manufacturing, regardless of whether this strategy itself constituted an ideal ‘fit’ with product-market needs. The “liability of staleness” discussed by Starr and Bygrave (1991) suggested that entrepreneurs may rely on conventional wisdom which may be trumped by newcomers who bring a less experienced but fresher perspective. The argument from the “liability of sameness” observes that entrepreneurs, over time, may tend to socialize in the same circles, which may hinder the flow of fresh information and ideas, and thus hurt their capacity for innovation. The argument from the “liability of priciness” suggests that

there may be unrealistic pressures placed upon the entrepreneurial startup that were not present for the serial entrepreneur's initial ventures. Starr and Bygrave argued, for instance, that suppliers may not be as willing to grant successful serial entrepreneurs the same leeway to pay bills late for a second venture that they allowed for the first venture. Such increased pressure from suppliers, customers and other venture stakeholders might make it harder for the venture to perform well under more difficult times. The "liability of costliness" occurs when successful large-venture entrepreneurs are offered a great deal of capital to run a second venture. Starr and Bygrave hypothesized the possibility that serial entrepreneurs aren't as fiscally prudent with this excess capital as they had previously been with the capital they used for their early ventures, and the ensuing waste of resources results in lowered odds of venture success.

Starr and Bygrave's arguments are logical and thoughtful, but difficult to empirically test. In addition, they are derived from case studies of highly successful technology entrepreneurs, which might not all apply to the typical serial entrepreneur. For instance, a serial entrepreneur managing a small business would probably not fall victim to a "liability of costliness" in the same way a Steve Jobs running a large startup such as NeXT or Pixar after founding Apple Computers might.

### **The Argument From Too Much Industry Experience**

Reuber and Fischer (1999) presented an argument from a cognitive perspective similar to Starr and Bygrave's "liability of staleness", suggesting that serial entrepreneurs may experience reduced flexibility in their strategic or creative thinking due to having too much experience in one industry. They cited a study that found that founders of firms similar to their previous firms were slow to adapt to a changing competitive environment,

and that executives who have worked in an industry for a long time have a greater commitment to the status quo versus innovative actions (Hambrick, Geletkanycz, & Frederickson, 1993). Further, they cited Chandler and Jansen (1992), who found that firm performance was *negatively* related to the similarity of tasks performed in the previous and current firm. Thus, serial founders who adapted their activities in a new venture had firms that performed better. However, the argument that prior industry experience calcifies thinking and reduces subsequent performance is disputed by Bruderl (1992), whose data suggested that same-industry experience significantly reduces the serial entrepreneur failure rate.

### **Findings in the Business Survival Literature**

Literature on factors that affect business survival rates have discovered factors that have been found to *increase* the length of business survival: higher educational attainment of the founding entrepreneur (Van Praag, 2003); prior industry experience of the founding entrepreneur (Bruderl, et al., 1992) and the new venture having sufficient capital and size to survive its early phases of existence (Honjo, 2000). None of the studies in this business-survival literature found that prior entrepreneurial experience helped the owners' businesses survive longer.

### **The Argument From Selection Into Entrepreneurship**

Another approach to the serial entrepreneur dilemma is a more statistical explanation. Perhaps by the time that entrepreneurs are measured as novice entrepreneurs on studies, there may already be a significant amount of self-selection out of and quality selection into entrepreneurship that has occurred. In other words, perhaps “novice” is not really synonymous with being completely new to entrepreneurship.

Perhaps the group of novices that many studies compare to serial entrepreneurs have thoroughly observed entrepreneurial processes, and those that remain and risk becoming full-time entrepreneurs will, on average, be high-quality performers, though they may never have actually started a business.

### **The Argument From Overconfidence**

Entrepreneurial overconfidence is another factor that has been identified as a possible culprit sabotaging a successful second venture. Some models of entrepreneurship, such as that introduced by Rae & Carswell (2000), have suggested that entrepreneurship is a process in which past successes can result in increased self-confidence. Busenitz and Barney (1997), among other researchers, have also highlighted increased self-confidence as characteristic of entrepreneurs relative to other groups of people such as entrepreneurial managers. While Rae & Carswell argued that heightened self-confidence is a positive attribute, Rerup (2005) posited that such self-confidence can have negative aspects. Rerup observed that experienced entrepreneurs may be inappropriately overconfident, may overestimate the likelihood of their potential success, and as a consequence may take unrealistic actions. They may take too much risk with novel, untried ideas because they think that, in light of their past successes, they can overcome the risk. Such actions based on irrational self confidence may lead serial entrepreneurs to experience failure or at least, less success than they otherwise might enjoy.

While the evidence that entrepreneurs are generally more self-confident than other groups seems well-supported, it may be questionable to suggest that serial entrepreneurs are more self-confident than novice entrepreneurs. It is true that serial entrepreneurs have

more positive experience that would seem to justify a high level of self-confidence, however novice entrepreneurs might possess self-confidence too, to forsake the security of “regular” work and seek self-employment. Neither group therefore should be more likely to fail due to overconfidence.

All the arguments advanced and discussed above, some perhaps more plausible than others, share the detriment that they are relatively difficult to test and support. In the following section, this research develops three plausible arguments and associated testable hypotheses to address the “serial entrepreneur dilemma”.

## **Theory and Hypotheses Development**

### **The Argument From a Learning Perspective**

There is a “common knowledge” sentiment that entrepreneurship involves considerable learning (Minnitti & Bygrave, 2001), and logically the more entrepreneurs learn about the practice of entrepreneurship, the better their businesses will perform. Indeed, the literature on entrepreneurial learning includes research that suggests new models of entrepreneurial learning using a case study approach (Rae, 2005) and research that adapts education models in the non-business literature to entrepreneurial learning (Cope, 2005).

One of the particularly interesting aspects of the serial entrepreneur dilemma is that it seems to call into question whether entrepreneurs really learn from the entrepreneurial process. Do serial entrepreneurs, who experience no greater results than novices, really learn, if learning is, according to one definition by Beach (1980), a process in which “behavior is modified” and thus experience should lead to better firm performance? Contentions like this are not supported by the available empirical evidence

of the serial entrepreneur dilemma. For instance, Deakins and Freel (1998, p. 153) claimed that “the ability of entrepreneurs to maximize knowledge as a result of experiencing...learning events will determine how successful their firm eventually becomes.” Cox and Jennings (1995) suggest that it is the ability to learn from mistakes and adversity that makes for successful entrepreneurs. The serial entrepreneur dilemma raises a question of whether serial entrepreneurs have really learned more valuable knowledge than novices.

Some models of entrepreneurial learning offers clues to why entrepreneurs might fail to learn from experience. Some entrepreneurial learning researchers have contended that entrepreneurs learn primarily through hands-on ‘doing’ rather than contemplation (Cope, 2005; Smilor, 1997). Smilor proposed a consequences-based approach to entrepreneurial learning, suggesting that entrepreneurs “learn from what works and, more importantly, from what doesn’t work”(Smilor, 1997, p. 344).

Corbett (2005) applied Kolb’s (1984) experiential learning theory to the field of entrepreneurship, suggesting that Kolb’s model of experience, reflection, thought, and experimentation applied to entrepreneurs. Corbett also discussed a typology of four learning styles from learning theory that he applied to the entrepreneurial field. Three of the four styles (the ‘converger’, the ‘diverger’, and the ‘accommodator’<sup>iii</sup>) involve some form of learning which utilizes lessons learned from experience.

---

<sup>iii</sup> The fourth general style is the “assimilator”, which entails conceptualization, reflection and observation to bring together seemingly separate activities.

However, research on cognition as it interacts with the entrepreneurial environment, not assessed by these researchers, suggested that in entrepreneurial environments it is especially hard to execute various mental processes such as decision making because of the quick pace and complexity of some industries. This literature correspondingly contends that entrepreneurs develop a body of “heuristics”—mental shortcuts—to enable them to make decisions more quickly despite the time pressures of their environments. Perhaps it is equally difficult to learn as well as make decisions in dynamic environments, which due to their turbulent and complex nature make it quite difficult to see the consequences of decisions which might be easier to observe in a less complex environment. Thus in grafting experiential learning theory onto the entrepreneurial universe without empirical support or considering the implications of a turbulent entrepreneurial environment, researchers such as Corbett may be mistaken.

Rerup (2005) further explained in his work on “mindful” and “mindless” learning why learning can be quite difficult in an serial entrepreneurial context. Rerup warned that entrepreneurs may not thoroughly consider the differences between a past venture and an ensuing one which could cause the latter venture to fail. Rerup cited the example of an importer of automobiles who succeeded in a first venture importing foreign cars into the United States, but failed in a similar, subsequent venture importing cars into the U.S. because he failed to take into account the lesser quality of the second automobile brand. Rerup identified that the simplifying mental templates that entrepreneurs tend to form which explain why a venture succeeds can create cognitive and behavioral ruts that must be avoided by striving for “mindfulness” (and maintaining complexity, diversity, and perspective in entrepreneurial thinking).

Another explanation why entrepreneurial learning may be considered difficult lies in the puzzle of entrepreneurial personality. Serial entrepreneurs may not outperform one-time entrepreneurs because entrepreneurship may be something that cannot effectively be taught to everybody, only to those with the inherent traits in their personality to absorb such learning. According to Deakins (1998, p. 146), “Most writers in this [traits] approach would not allow for an experiential learning role to alter behavior in entrepreneurship, since inherent personality characteristics cannot be taught.”

Reuber and Fischer (1999) had several valuable contributions to the issue of why serial entrepreneurs might not learn effectively. Their first insight was to observe that serial entrepreneurs might really not be obtaining as much reinforcement of key entrepreneurial tasks as expected. They argued that expertise in anything, generally speaking, is typically acquired through multiple repetitions of the same task. Serial entrepreneurs, however, usually start only a few businesses in their lifetimes, and carry out regular activities such as preparing a strategic plan or capital budget, forecasting, or hiring managers relatively infrequently. Larger-scale endeavours, Reuber and Fischer argued, are performed even less often.

A second useful observation by Reuber and Fischer (1999, p. 35) is that prior experience can slow down learning in a new context since “some knowledge and skills need to be ‘unlearned’ before learning in the new context can take place.”

The preceding observations suggest the following hypothesis, focusing on the environmental aspect of entrepreneurial learning:

**Hypothesis 1.** *In industries characterized by (faster/slower) environmental change, serial entrepreneurs will perform*

*(indistinguishably from/better than) novice entrepreneurs due to differences in entrepreneurial learning in these disparate environments.*

### **The Argument From Motivation Theory**

Two contrasting points of view can be offered regarding to serial entrepreneur motivation. Both are presented here, with the more plausible argument culminating in a hypothesis. The first argument proceeds as follows: that one possible reason that experienced entrepreneurs may not outperform novices is that they have become less motivated. This lessened motivation may lower the experienced entrepreneurs' performance, negating some of the gains from experience that would otherwise accrue to them.

Some research has demonstrated that elements of entrepreneurial motivation are apparently contingent on factors that may change over multiple ventures. One such motivator is the wealth effect for serial entrepreneurs. Multiple studies have demonstrated that the accumulation of wealth is a key motive to entrepreneurial motivation. For instance, Suzuki, Kim and Bae (2002) found in a comparative study of Japanese and American entrepreneurs that the American entrepreneurs were particularly highly motivated by the accumulation of personal wealth. Koratko, Hornsby & Naffziger (1997) demonstrated in a factor analytic study that accumulating wealth is an important goal of entrepreneurs generally. Buttner and Moore (1997) pointed out that individuals often start businesses for reasons that include earning more money.

As serial entrepreneurs succeed in their early venture(s), their accumulated wealth means that they would gain a lesser share of their overall personal wealth from additional invested time and effort. This fact might lead these entrepreneurs to reduce the effort

they put into these future ventures, or even opt out of entrepreneurship entirely. This effect might be magnified by entrepreneurs who never were passionate about entrepreneurship, but started their ventures primarily because of the associated potential financial rewards.

Naffziger et al. (1994) introduced a model that may identify why serial entrepreneurs fail to show gains from experience. Their model demonstrates that entrepreneurs enter the entrepreneurial arena with expectations of extrinsic and intrinsic outcomes, such as the attainment of wealth, that result from the inception and the operation of the venture. While specific expectations vary by entrepreneur, Naffziger et al. expect that as a group they will continually compare the business's results with their goals and expectations, and decide whether to continue to put the same degree of effort into their entrepreneurial work.

Using Naffziger et al.'s model, successful wealth accumulation after starting and running several ventures may cause some of the most successful serial entrepreneurs to feel that they have achieved their goals for entrepreneurship, and to put less effort into their businesses.

Despite the above line of reasoning, however, the opposite and more convincing case can be made that serial entrepreneurs will actually be more motivated than one-time entrepreneurs. The simple fact that SE's return to start additional businesses represents highly convincing evidence that these SE's are motivated to succeed and devote themselves wholeheartedly to the process of running their next business. If they were not interested in taking on such hard work, this argument suggests, these serial entrepreneurs would simply drop out of entrepreneurship. A second line of reasoning supporting high

motivation for SE's is that entrepreneurs in general are often very internally motivated people driven to achieve results by the basic nature of their character. This motivation is known in the psychological literature, from the pioneering work of McClelland, as "nAch" (McClelland, 1965). Unlike wealth level, which may be expected to change as entrepreneurs start multiple ventures, personality traits may not change as entrepreneurs' wealth level increases. Third, serial entrepreneurs seem to be motivated by other basic aspects of the entrepreneurial process, such as controlling their environments, being their own boss, experiencing excitement, and achieving personal freedom (Naffziger, et al., 1994; Scott Shane, Edwin A. Locke, & C.J. Collins, 2003). Shane (2003) stressed that many entrepreneurs remain in "the game" because of love, the sheer passion for the work. It would seem that all these are motivational factors that would not lessen as serial entrepreneurs take on additional businesses.

Following the latter line of argument, the following hypotheses will be tested to explore the motivational character of the serial entrepreneur:

**Hypothesis 2a.** *Serial entrepreneurs will devote more time to current ventures than novice entrepreneurs do, on average.*

**Hypothesis 2b.** *Serial entrepreneurs will devote more wealth to current ventures than novice entrepreneurs do, on average.*

### **The Argument For Same Industry Diversification Advantages**

At first, it may seem that there are are compelling examples and theoretical arguments that may indicate disadvantages that serial entrepreneurs incur when they start businesses within the same industry for subsequent ventures.

Consider the case of Georges Perrier, a highly successful chef and owner of a famous gourmet restaurant, Le Bec-Fin, in Philadelphia, Pennsylvania (USA). As a result of the chef's success as the owner of the gourmet restaurant, Perrier considered expansion through creating several new restaurants. He was essentially limited to the restaurant industry since that was the area of his primary expertise and reputation. But he could not open up another ultra high-end dining establishment, since the current market could not support a similar restaurant. He therefore decided to open up a popular French bistro whose level of quality and service was high but lower than Le Bec-Fin, and subsequently a middle-of-the-road casual restaurant. Both of these ventures were only moderately successful<sup>iv</sup>.

Sometimes, when entrepreneurs seek a second opportunity in the same industry, they may not be able to take advantage of the same niche and skills that provided them with great success initially. This was the Perrier's dilemma. His expertise was in running a top quality gourmet restaurant, not a trendy popular restaurant. Given the constraints of area and industry, he was limited to trying to start several restaurants outside of his area of special expertise. Because of these limitations, it would not be a surprise if his odds of success were considerably lowered.

The famous ex-founder of Apple Computer and currently its CEO, Steven Jobs, underwent such an unsuccessful entrepreneurial transition within his industry. After he

---

<sup>iv</sup> The French bistro has since closed as of 2009. The more casual restaurant still operates. Perrier has since gone on to open up several other restaurants.

initially separated from Apple, he subsequently founded another company in the computer industry, NeXT computer. While the NeXT computers were appealing and had a number of attractive features, the venture ended up being a costly failure. As with the case of the gourmet chef, a second venture in the same industry proved to be a failure for an entrepreneur who had been highly successful in one niche but had to find a different niche the second time around.

Franchises succeed because they are able to replicate almost exactly the conditions that make the model successful, only varying the location. The data that have been used which exhibit the “serial entrepreneur dilemma” may well be examples where franchises were not possible, similar to the cases of Jobs or Perrier, and the serial entrepreneur attempted a new venture which was different in a number of important ways from their first successes. These conditions may explain why many serial entrepreneurs do not experience more success with their ensuing ventures, perhaps often even not being more successful than the business of a novice.

The “liability of staleness” (Starr & Bygrave, 1991) mentioned above, is another reason why entrepreneurs who start businesses in the same industry may experience limited success. Such entrepreneurs may not bring a fresh, new perspective to their ensuing ventures, instead relying on conventional wisdom of the industry that may not be useful in starting a truly innovative ensuing venture. Novice entrepreneurs may be less familiar with such conventional wisdom, which may result in them creating more unorthodox but sometimes more successful ventures.

Starr & Bygrave’s (1991) argument from the “liability of sameness” suggested that serial entrepreneurs, over time, may tend to socialize in the same circles, which may

limit their flow of new and innovative information. A particular industry may be considered such a limiting social circle for the entrepreneurs who start businesses in that industry.

Also, serial entrepreneurs who start ensuing businesses in the same industry may not be taking advantages of the best possible opportunities that exist in the marketplace. Schoonhoven et al. (1990) found that entrepreneurs tend to start ventures in markets they know well rather than in markets that are objectively attractive.

Despite the arguments presented above, however, an extensive literature on related diversification demonstrates thoroughly that firms which diversify into related businesses tend to have performance advantages over firms which diversify into unrelated ones. Rumelt (1982), in a seminal article, tested various categories of diversified firms and concluded that unrelated diversifiers tend to manifest the worst performance of all the types of diversifying firms. Bettis (1981) presented findings that showed that firms practicing related diversification have performance advantages over unrelated diversifiers, advantages which stemmed at least in part from research and development expenditures. More recently, similar findings on the performance advantages of related diversification were discussed by Amit and Livnat (1988), and Simmonds (1990). In general, it seems that the advantages of related diversification, in particular knowing one's industry well, outweigh the advantages of unrelated diversification.

In light of all the findings on the advantages of related diversification, therefore, this research will test the following hypotheses:

**Hypothesis 3a.** *Serial entrepreneurs will tend to start businesses in their same industry.*

**Hypothesis 3b.** *Serial entrepreneurs who start businesses in their same industry will experience greater success than serial entrepreneurs who start businesses in a new industry.*

## **Methodology**

### **Overview of Study, Data Collection and Sample Characteristics**

The hypotheses for this paper are tested on secondary data from the largest longitudinal study ever performed of new United States businesses, and the characteristics of the owners of these businesses, the Kauffman Firm Survey (KFS). This study was carried out by the Ewing Marion Kauffman Foundation. The KFS gathered its data using a random sample from Dun & Bradstreet's database list of approximately 250,000 new businesses started in 2004 in the United States, and followed the progress of these businesses and their owners longitudinally each year through the year 2007. The businesses that the KFS included in its sample were businesses that were new business starts, purchases of existing businesses by a new owner or owners, and franchise purchases. The KFS collected data on topics including business characteristics, business strategy and innovation, business organization and HR benefits, business finances, and the demographics of the owners. Particularly relevant to this study were questions on how many businesses the owners had started (the owners' participation in serial entrepreneurship).

The KFS was particularly appropriate for use in this particular study since it so large-scale and because it is based in the United States. One of the aspects of all previous large-scale studies in the serial entrepreneur literature is that they are based outside the United States. The overwhelming preponderance of entrepreneurial data which show the dilemma include countries such as England (Westhead & Wright, 1998), China (Li, et al., 2008), and the Netherlands (Kolvereid & Bullvag, 1992). It is possible that there are some unknown factors that influence entrepreneurial behavior abroad, rather than in the United States, which would cause the serial entrepreneur dilemma to fail to hold here in the U.S. Therefore, it is important to test whether the serial entrepreneurship dilemma holds as well in the United States.

To carry out the KFS, a random sample of 32,469 businesses was taken from Dun & Bradstreet's database list of new businesses started in 2004. A total of 17,258 businesses were screened for eligibility. Eligible businesses were businesses that were not owned by an existing business, inherited from someone else, or legally established as a non-profit; and that first became eligible to do business in or transacted business in 2004. Following these criteria resulted in the identification of 6,030 eligible businesses. This comprised a 35% eligibility rate. Interviews were completed in 2005 with the principals of 4,928 businesses that started operations in 2004, who were interviewed by telephone and paid \$50 to complete the survey. Interviews were carried out in the subsequent 3 years with the principals from the businesses from the initial KFS sample that remained in business and that agreed to be re-interviewed. The statistics performed in the following analysis represent statistics collected for the first year of the study unless otherwise indicated.

## **Analyses and Results**

The statistical software SPSS Version 17 was used to run all statistical tests.

Descriptive statistics indicated that 1.7% of the businesses in the study were larger than \$1 million in revenues in the first year of the study (2004). A total of 33.7% of the businesses had revenues between \$25,000 and \$1 million dollars.

There were a total of 2,087 serial entrepreneurs (42.5% of the entrepreneurs in the study), and 2,824 novice entrepreneurs in the study (57.5% of the entrepreneurs in the study). Data on entrepreneur type was not available for 17 entrepreneurs in the sample, bringing the total to the 4,928 cases included in the sample. The percentages found for serial entrepreneurs seem consistent with Scholhammer's (1991) finding of 51% of his sample as serial entrepreneurs and Ronstadt's (1986) finding of 63% of current entrepreneurs and 40% of ex-entrepreneurs as being serial entrepreneurs. Refer to Table 36 for selected demographic statistics of the KFS. Since the majority of the data was collected in ordinal form, it was not possible to include a typical chart of means and standard deviations.

A first step in analyzing the results for this paper was to establish whether the "Serial Entrepreneur Dilemma" held for this study. A dichotomous independent variable with value 0 for novice entrepreneurs and value 1 for entrepreneurs who had started one or more businesses was computed. This variable was first tested against the dependent variables Business Losses and Business Profits individually (the KFS collected ordinal data for business losses separately from data on business profits). A Mann-Whitney nonparametric test was first conducted with the serial entrepreneur variable as the independent variable and Business Losses as the dependent variable to determine

Table 36.  
*Descriptive Statistics for KFS Participants*

---

Variable
Total Revenue
Don't know/Refused
\$500 or less
\$500-\$10000
\$1,000-\$3000
\$3,000-\$5,000
\$5,000-\$10,000
\$10,000-\$25,000
\$25,000-\$100,000
\$100,000-1,000,000
\$1,000,000+
Total Hours Owner Worked Per Week
<20
20-35
36-45
46-55
56-65
66+
Number of Other Businesses Owned
0
1
3
4
5+
Were Businesses in the Same or Different Industry as Previous Business Started?
Same Industry
Different Industry
Missing

---

whether, of the individual businesses in the KFS that did have a loss, there was a difference between novice and serial entrepreneur groups. The Mann-Whitney test is the non parametric equivalent of a t test. It was used because the dependent variable Business Losses was ordinal scaled. The mean rank and sum of ranks are listed in Table 37. The Mann-Whitney Test (Table 38) revealed a significant difference between the two groups on Business Losses,  $p < .001$ . Serial entrepreneurs were posting higher losses than the novice entrepreneurs.

Table 37. *Mean & Sum of Ranks for Entrepreneur Groups Posting Business Losses*

Group	N	Mean Rank	Sum of Ranks
Novice Entrepreneur	1460	1175.03	1715543.00
Serial Entrepreneur	1038	1354.25	1405708.00

Table 38. *Mann-Whitney for Business Losses*

Statistic	Value	Sig.
Mann-Whitney U	649013.000	.000

Continuing with the analysis, the independent variable representing serial entrepreneurs was calculated versus Business Profits, again using a Mann-Whitney nonparametric test for ordinal scaled data. The test statistic indicated a significance of .845, which failed to indicate a difference in performance regarding Business Profits between novice and serial entrepreneur groups, as the Serial Entrepreneur Dilemma generally suggests. See the following tables 39 and 40.

Table 39. *Mean & Sum of Ranks for Business Profits*

Group	N	Mean Rank	Sum of Ranks
Novice Entrepreneur	1197	1037.92	1242384.00
Serial Entrepreneur	883	1044.00	921855.50

Table 40. *Mann-Whitney for Business Profits*

Statistic	Value	Sig.
Mann-Whitney U	525381.500	.817

Another Mann-Whitney test was conducted using business revenues in 2004 as the dependent variable, and novice or serial entrepreneur as the independent variable. This test exhibited a p value of .001, which suggested that novice and serial entrepreneur groups differed with a high degree of statistical significance with regards to the revenues of their respective businesses, with the serial entrepreneur businesses having greater revenues. See the following Tables 41 and 42.

A final way to test whether the Serial Entrepreneur Dilemma was present in this data was to test whether or not novice and serial entrepreneur groups differed on the number of employees present in their businesses. The KFS had solicited data for number of employees in the businesses in the study. The data on number of employees was collected in ratio form (exact counts of number of employees were available, unlike revenues, whose data was collected in ranges) thus a t test was the appropriate analysis

Table 41. *Mean & Sum of Ranks for Business Revenues*

Group	N	Mean Rank	Sum of Ranks
Novice Entrepreneur	2727	2310.02	6299413.00
Serial Entrepreneur	2004	2442.18	4894133.00

Table 42. *Mann-Whitney for Business Revenues to Establish Serial Entrepreneur Dilemma*

Statistic	Value	Sig.
Mann-Whitney U	2579785.000	.001

to conduct. The dependent variable scores were standardized by group, and the resulting z-scores were used to identify outliers in the data. Participants with a z-score greater than  $|3|$  were removed. Levene's Test was significant at less than the .001 level. The means and standard deviations of the number of employees for both groups are listed in Table 6a.

The t-test revealed a significant difference between the two groups on the number of employees,  $t(3547.12) = -5.85, p < .001$ . The serial entrepreneurs ( $M = 1.24, SD = 2.12$ ) had more employees than the novice entrepreneurs ( $M = 0.92, SD = 1.65$ ). This finding indicated that serial entrepreneur businesses were significantly larger with regards to number of employees than novice entrepreneur businesses. See Tables 43 and 44.

In sum, the presence of the Serial Entrepreneur Dilemma was tested for in the KFS using ordinal data with a Mann-Whitney test for profits, losses, and revenues, then with a t test using the dependent variable number of employees. The findings overall

Table 43. *Means and Standard Deviations of Number of Employees by Group*

Group	N	M	SD
Novice Entrepreneur	2689	0.92	1.65
Serial Entrepreneur	1953	1.24	2.12

Table 44. *Independent Samples t-test on Number of Employees by Group*

Dependent Variable	t	df	Sig.	Mean Difference	SE of Difference	Lower Bound	Upper Bound
Number of Employees	-5.63	3547.12	.000	-0.32	0.06	-0.44	-0.21

indicate that novice and experienced entrepreneur groups fail to be found different with regard to business profits, but have been found to be demonstrably different with regard to number of employees, amount of business losses, and revenues.

Hypothesis 1 suggested that in industries characterized by faster environmental change, serial entrepreneurs will perform indistinguishably from novice entrepreneurs because it will be difficult to learn from experience in these environments, but that serial entrepreneurs will outperform novices for slower moving environments. For this hypothesis, environmental change was operationalized by dividing the businesses in the KFS sample into two categories: fast moving environments, represented by high tech businesses (which presumably, like the computer industry, change relatively quickly-see Eisenhardt (1989)); and medium and low tech businesses (which presumably change less

quickly). The researchers who developed the KFS originally developed the strata of high, medium, and low tech businesses using the NAICS codes for the companies in the various industries sampled by the KFS. Then for the purposes of statistical analysis, these businesses were divided into the two groups of fast moving and slow moving environments.

The statistical findings support Hypothesis 1. In fast moving high-tech environments, serial entrepreneurs and novice entrepreneurs failed to exhibit a statistically significant difference between the two groups with regard to performance on total revenue,  $p = .92$ . However, in slower, low-tech environments, serial entrepreneurs outperformed novice entrepreneurs notably, with a degree of statistical significance less than  $.001$ . See Tables 45-48.

This finding may indicate that serial entrepreneurs are more able to learn from their experiences in slow moving environments and incorporate their learning into the operation of their businesses. A Mann-Whitney test was also conducted for the dependent variable Profit across the two environments, however the two groups, novices and serial entrepreneurs, failed to differ regarding profits in either a fast moving or a slow moving environment.

Hypothesis 2 suggested that serial entrepreneurs will devote more time and wealth to their businesses than novice entrepreneurs. The statistical evidence supports this hypothesis. By a statistically significant amount ( $p = .02$ ), serial entrepreneurs work more hours in a week than novice entrepreneurs do (mean rank 2470 to 2376), and invest more money in their businesses than novices do ( $p < .001$ , mean rank 2611 to 2338). See the following Tables 49-52.

Table 45. *Mean & Sum of Ranks for Fast Moving Environment / High Tech Businesses*

Group	N	Mean Rank	Sum of Ranks
Novice Entrepreneur	333	336.23	111965.50
Serial Entrepreneur	337	334.78	112819.50

Table 46. *Mann-Whitney for Fast Moving Environments*

Statistic	Value	Sig.
Mann-Whitney U	55866.500	.920

Table 47. *Mean & Sum of Ranks for Slow Moving Environment/Lower Tech Businesses*

Group	N	Mean Rank	Sum of Ranks
Novice Entrepreneur	2394	1977.43	4,733,962.00
Serial Entrepreneur	1667	2107.94	3,513,929.00

Table 48. *Mann-Whitney for Hypothesis 1 , Slow Moving Environments/Low Tech Businesses*

Statistic	Value	Sig.
Mann-Whitney U	1,867,147.000	.000

Table 49. *Mean & Sum of Ranks for Hypothesis 2, Hours Worked by Group*

Group	N	Mean Rank	Sum of Ranks
Novice Entrepreneur	2777	2376.84	6,600,490.50
Serial Entrepreneur	2055	2470.09	5,076,037.50

Table 50. *Mann-Whitney for Hypothesis 2, Hours Worked by Group*

Statistic	Value	Sig.
Mann-Whitney U	2,743,237.50	.020

Table 51. *Mean & Sum of Ranks for Hypothesis 2, Amount of Money Owner Invested in Business*

Group	N	Mean Rank	Sum of Ranks
Novice Entrepreneur	2817	2338.08	6,586,363.50
Serial Entrepreneur	2091	2611.35	5,460,322.50

Table 52. *Mann-Whitney for Hypothesis 2, Amount of Money Owner Invested in Business*

Statistic	Value	Sig.
Mann-Whitney U	6,586,363.500	.000

Hypothesis 3a stated that serial entrepreneurs will tend to start businesses in the same industry. The results show that approximately 42% of the entrepreneurs in the study started businesses in the same industry that they had previously. Hypothesis 3b stated that serial entrepreneurs who start businesses in the same industry will experience higher levels of success than novices. Success was operationalized here as revenues attained. The findings indicate that this hypothesis was supported. Regarding revenues, the two groups, novice and serial entrepreneurs, differed significantly ( $p < .001$ ); and entrepreneurs who started businesses in the same industry were the better performers (mean rank = 1051), than those who ventured into a new industry (mean rank = 965). See the following Tables 53-54.

Table 53. *Mean & Sum of Ranks for Revenues of Serial Entrepreneurs Starting Businesses in Same and Different Industries (Hypothesis 3b)*

Group	N	Mean Rank	Sum of Ranks
Same Industry	845	1051.54	888,551.00
Different Industry	1157	964.95	1,116,452.00

Table 54. *Mann-Whitney for Hypothesis 3b*

Statistic	Value	Sig.
Mann-Whitney U	446,549.00	.001

### Discussion

To revisit the central question of the paper, why don't serial entrepreneurs show a difference in performance in previous studies versus novice entrepreneurs? It must be observed, to begin with, that the KFS data did not fully exhibit the Serial Entrepreneur Dilemma. The firms sampled in the year of the KFS covered by this analysis, the year 2005, did not reflect a difference in profits between serial and novice groups, but did differ in several other important respects. The serial entrepreneur businesses had greater revenues and had a greater number of employees, but lost more money. Since 2004, the year previous to the year the KFS data collection began, was the first year of these firms' operations, the data suggest that serial entrepreneurs were starting bigger businesses than the novice entrepreneurs. The results for Hypothesis 2 suggest that the serial entrepreneur group were investing more of their own money into these new business

starts, which may help explain why these new businesses were bigger in employee size than the novice entrepreneurs' business starts.

The data may suggest that the serial entrepreneurs, though receiving negligibly greater profits in the early years of a business, were investing their time and money in anticipation of greater profits in the future. It is difficult to consider otherwise why an experienced and capable group would work harder and invest more than a less experienced group if they would make the same returns forever. Thus, a new potential explanation for the "Serial Entrepreneur Dilemma" not previously considered presents itself: perhaps the differences between serial and novice entrepreneur groups manifest themselves *over time longitudinally*, but in a cross-sectional study are difficult to see. The KFS was ideal to test for this possibility, since it included data on the subsequent performance of the businesses in the study for three subsequent years after the first year of the study.

To test for this possibility, a non parametric Mann-Whitney test with profit as the dependent variable and serial versus novice type entrepreneur as the independent variable was run for the third follow-up year of the KFS study. Indeed, the p value for this test was now significant at the .05 level (p value of .046). See Tables 55 and 56.

This finding indicated that as the businesses of the serial entrepreneurs were compared with the businesses of the novices over time, the serial entrepreneurs' businesses had become more profitable to a statistically significant degree versus the novice entrepreneurs' businesses. A t test was also run on number of employees in the third follow-up year, and the difference between the mean number of employees between

Table 55. *Mean & Sum of Ranks for Profit by Entrepreneur Group, Third Followup Year of KFS*

Group	N	Mean Rank	Sum of Ranks
Novice Entrepreneur	1034	859.18	888,395.00
Serial Entrepreneur	723	907.34	656,008.00

Table 56. *Mann-Whitney for Profit by Entrepreneur Group, Third Followup Year of KFS*

Statistic	Value	Sig.
Mann-Whitney U	353,300.00	.046

the novice and serial groups was significant at less than the .001 level, indicating that the serial entrepreneurs' businesses were still significantly larger than the novices' group of businesses.

The hypothesis that more entrepreneurial learning was taking place in slow-moving than fast-moving industries also helps explain the serial entrepreneur dilemma. The results indicate that in firms in slow-moving industries, serial entrepreneurs performed much better than novice entrepreneurs in revenues, whereas in fast-moving industries the difference between the two groups was negligible. It is possible that these results reflect that entrepreneurial learning is easier in slow-moving environments, thus the experience of the serial entrepreneurs in these environments may have resulted in more valuable learning than in fast-moving industries.

The argument related to entrepreneurial motivation found that serial entrepreneurs are in several respects more motivated than novices, specifically spending more time and

investing more money in their businesses than the novices. This finding, therefore, does not contribute to an explanation of the serial entrepreneur dilemma, since more serial entrepreneur motivation from the serial entrepreneurs that remain in the sample over time should lead serial entrepreneurs to better performance than novices.

The “argument for same industry diversification advantages” was supported by the statistical results. Whatever negative effects there may have been of starting a business in the same industry were apparently counteracted by the benefits of starting new businesses in the same industry, which could be for instance specific knowledge of that industry (such as Georges Perrier’s knowledge of French cooking and knowledge of how to maintain a restaurant to proper health codes, and so forth). Thus the statistical results for this hypothesis were that serial entrepreneurs starting businesses in the same industry were more successful than serial entrepreneurs who branched out into a different industry.

Revisiting a point covered in the literature review, Starr and Bygrave’s hypothesized “liability of costliness”, which suggested that when serial entrepreneurs experience business successes they aren’t as fiscally prudent when given large amounts of money to start ensuing ventures, did not seem to apply to the businesses in this study since the overwhelming majority of these businesses were under \$1 million in revenues.

### **Limitations**

The KFS did not sample from failed businesses (failed businesses dropped out of the study over time). This implies that research done on the KFS may suffer from survival bias. However no remedy exists.

## **Conclusion**

Carter and Ram (2003, p. 372) observed, “Despite increasingly sophisticated analyses, no study has yet been able to identify significant differences in the performance of businesses started by serial founders [and novices]”. This paper, employing a large-scale, longitudinal design to address the difference between serial entrepreneurs and novices, is such a study. The results of this study suggest several important points. First, serial entrepreneurs may be satisfied with making negligibly higher profits than novice entrepreneurs in the early years of a business because, they are confident of higher future profits. Such a result is apparent in our longitudinal data. Second, entrepreneurial learning may be difficult in the average entrepreneurial environment, and when serial entrepreneur performance is separated into fast and slow moving environments, their learning is enhanced in slow-moving environments, where learning is easier. While the “serial entrepreneur dilemma” may have other valid, contributing reasons than these, such as some of the difficult to test explanations advanced in this paper’s literature review, the researchers believe this research has made major strides towards the dilemma’s resolution.

Although the finding in this paper that different speed environments affect serial entrepreneurial performance versus novices is an important start, future research could explore in greater detail the phenomenon of entrepreneurial learning from an empirical point of view.

## CONCLUSION

This dissertation concludes with a review of the most important contributions of the three papers.

Paper 1, “Entrepreneurial Heuristics...”, found that being mentored, rather than either having extensive higher education or more work experience, was primarily responsible for entrepreneurs acquiring the simplified decision rules (heuristics) that can be useful to them in their business pursuits. The study also found that entrepreneurs do not seem to switch their decision making processes from a “rational man” (thorough analysis) mode to a more abbreviated, heuristic mode as some current thinking suggests. Also in Paper 1 this researcher utilized a 27 item heuristics scale (available from this researcher) which was used to identify “use of heuristics” by the entrepreneurs studied.

Paper 2, “Female Serial Entrepreneurs...”, examined the characteristics of female serial entrepreneurs (SE’s) as a group of growing size and importance. The three areas of business size, hours worked in the business, and amount and type of capital raised, were explored through contrasting female SE’s with female non-SE’s and male SE’s. The primary findings were as follows: first, in some respects female SE’s are different from female non-SE’s. The businesses of female SE’s are larger than those of female non-SE’s, and female SE’s in the professional, technical and scientific services industry incur more debt than female SE’s in this same services sector. Second, female SE businesses, in the industries examined in the study, have come to rival male SE businesses in size (as measured in revenues). Third, male SE’s still raise more capital in than female

businesses in the professional, technical and scientific services industry, but not in the general manufacturing industry.

However in other respects, such as hours worked in their businesses, female SE's remained similar to female non-SE's.

This study has important public policy implications; perhaps public policy should attempt to alleviate some of the remaining family responsibilities of some female SE's which may be hindering their ability to run their businesses to full advantage.

Paper 3, "The Serial Entrepreneur Dilemma...", in a more theoretical contribution, explains a conundrum in the literature: why serial entrepreneurs do not seem to outperform novice entrepreneurs. A full literature review is given consisting of the current thinking about the causes of the conundrum, and then three hypotheses are tested to explore the dilemma. It is found that looking at serial entrepreneurs and novices over time, rather than cross-sectionally, helps explain the conundrum: the SE's are willing to take losses early on (thus not performing higher than the novices) in expectation of future profits. It is also found that serial entrepreneurs do not seem to learn as much as novice entrepreneurs in fast-moving industry environments.

One similar theme that these papers all share is that they suggest useful practices for real-world entrepreneurs. Paper 1 suggests that, for entrepreneurs to be most successful, they ought at some point in their careers secure an experienced mentor who can teach them the most important heuristics that pertain not only to entrepreneurship more generally but to the particular industry the entrepreneur chooses to work in. Paper 2 suggests to some female serial entrepreneurs that they need to find ways to cope with the demands of family responsibilities if they desire to improve their performance even

further. And finally, Paper 3 suggests that serial entrepreneurship involves a long term perspective; therefore, potential serial entrepreneurs must keep in mind the need for short-term sacrifice so they may thrive in the long run. Also, Paper 3 may suggest that if serial entrepreneurs want to maximize the learning they can draw from their experiences, perhaps they should decide to run businesses (at least early in their careers) which are in slow-moving, rather than fast-moving, industries.

## REFERENCES

- Amit, R., & Livnat, J. (1988). Diversification Strategies, Business Cycles and Economic Performance. *Strategic Management Journal*, 9(2), 99-110.
- Anna, A. L., Chandler, G. N., Jansen, E., & Mero, N. P. (1999). Women business owners in traditional and non-traditional industries. *Journal of Business Venturing*, 15, 279-303.
- Anonymous (1995). *Women in Management Review*, 10.
- Ballou, J., & DesRoches, D. (2009). *Kauffman Firm Survey (KFS): Baseline Annotated Questionnaire*
- Bardoel, E. A., Tharenou, P., & Ristov, D. (2000). The changing composition of the Australian workforce relevant to work family issues. Monash University.
- Barney, J. B. (2001). Resource-based theories of competitive advantage: A ten-year retrospective on the resource-based view. *Journal of Management*, 27(6), 643-665.
- Baron, R. A. (2004). The cognitive perspective: a valuable tool for answering entrepreneurship's basic "why" questions *Journal of Business Venturing* 19(2), 221-239.
- Baron, R. A., & Ward, T. B. (2004). Expanding Entrepreneurial Cognition's Toolbox: Potential Contributions from the Field of Cognitive Science. *Entrepreneurship Theory & Practice*, 28(6), 553-573.
- Bazerman, M. (2006). *Judgment in Managerial Decision Making*: John Wiley and Sons.
- Beach, D. (1980). *Personnel: The Management of People at Work*. New York, NY: Macmillan.
- Bell, D., Raiffa, H., & Tversky, A. (1988). *Decision Making: Descriptive, Normative and Prescriptive Interactions*. Cambridge, MA: Cambridge University Press.
- Bettis, R. (1981). Performance Differences in Unrelated Firms. *Strategic Management Journal*, 2(4), 379-393.
- Bhide, A. (1992). Bootstrap finance: the art of start-ups. *Harvard Business Review*, 70(6), 109-117.
- Bigley, G. A., & Roberts, K. H. (2001). The Incident Command System: High Reliability Organizing for Complex and Volatile Task Environments. *Academy of Management Journal*, 44(6), 1281-1299.
- Birley, S. (1989). Female entrepreneurs: are they really any different? *Journal of Small Business Management*, January, 32-37.
- Boeker, W. (1989). The development and institutionalization of subunit power in organizations. *Administrative Science Quarterly*, 34, 388-410.
- Bourgeois, L. J., & Eisenhardt, K. (1988). Politics of Strategic Decision Making in High-Velocity Environments: Toward a Midrange Theory. *Academy of Management Journal*, 31(4), 737-770.
- Brody, N. (Ed.) (2000) *Encyclopedia of Psychology*. Cambridge: Oxford University Press.
- Bruderl, J., Preisendorfer, P., & Ziegler, R. (1992). Survival chances of newly founded business organizations. *American Sociological Review*, 57(2), 227-242.

- Brush, C. (1992). Research on women business owners: Past trends, a new perspective, and future directions. *Entrepreneurship Theory & Practice, Summer*(16), 5-30.
- Bryant, D. J. (2007). Classifying Simulated Air Threats With Fast and Frugal Heuristics. *Journal of Behavioral Decision Making, 20*, 37-64.
- Busenitz, L., & Barney, J. (1997). Differences Between Entrepreneurs and Managers in Large Organizations: Biases and Heuristics in Strategic Decision Making. *Journal of Business Venturing, 12*(1), 9-31.
- Buttner, E. H., & Moore, D. P. (1997). Women's organizational exodus to entrepreneurship: Self-reported motivations and correlates with success. *Journal of Small Business Management, 35*, 34-46.
- Buttner, E. H., & Rosen, B. (1989). Funding new business ventures: Are decision makers biased against women entrepreneurs? *Journal of Business Venturing, 4*, 249-261.
- Calantone, R., Garcia, R., & Droge, C. (2003). The Effects of Environmental Turbulence on New Product Development Strategy Planning. *Journal of Product Innovation Management, 20*(2), 90-103.
- Carter, S. (1999). Multiple business ownership in the farm sector: assessing the enterprise and employment contributions of farmers in Cambridgeshire. *Journal of Rural Studies, 15*, 417-429.
- Carter, S., & Ram, M. (2003). Reassessing portfolio entrepreneurship. *Small Business Economics, 21*, 371-380.
- Chaganti, R. (1986). Management in women-owned enterprises. *Journal of Small Business Management, 24*, 18-29.
- Chandler, A. (1966). *Strategy and Structure: Chapters in the History of the Industrial Enterprise*. Garden City, NY: Doubleday.
- Cliff, J. (1998). Does one size fit all? Exploring the relationship between attitudes towards growth, gender, and business size. *Journal of Business Venturing, 13*, 523-542.
- Coleman, S. (2000). Access to capital and terms of credit: A comparison of men- and women-owned small businesses. *Journal of Small Business Management, 38*(3), 37-52.
- Cooper, A., Gimeno-Gascon, F. J., & Woo, C. (1994). Initial human and financial capital as predictors of new venture performance. *Journal of Business Venturing, 9*, 371-395.
- Cope, J. (2005). Towards a dynamic learning perspective of entrepreneurship. *Entrepreneurship Theory & Practice, 29*(4), 373-397.
- Corbett, A. C. (2005). Experiential learning within the process of opportunity identification and exploitation. *Entrepreneurship Theory & Practice, 473-491*.
- Coverman, S. (1983). Gender, domestic labor time, and wage inequality. *American Sociological Review, 48*, 623-637.
- Cox, C., & Jennings, R. (1995). The foundations for success: the development and characteristics of British entrepreneurs and intrapreneurs. *Leadership & Organization Development Journal, 16*(7), 4-9.
- Cromie, S. (1987). Motivations of aspiring male and female entrepreneurs. *Journal of Occupational Behaviour, 8*(3), 251-261.
- Cunningham, L. (2001). *How to Think Like Benjamin Graham and Invest Like Warren*

- Buffett*. London: McGraw-Hill.
- Deakins, D., & Freel, M. (1998). Entrepreneurial learning and the growth process in SME's. *The Learning Organization*, 5(3), 144-155.
- DeLuca, J. (1988). Strategic Career Planning in Non-Growing Volatile Business Environments. *Human Resource Planning*, 11(1), 49-62.
- DesRoches, D., & Barton, T. (2009). Kauffman Firm Survey: Third Follow-Up Annotated Questionnaire.
- Dhami, M. K., & Ayton, P. (2001). Bailing and Jailing the Fast and Frugal Way. *Journal of Behavioral Decision Making*, 14, 141-168.
- Donckels, R., & Dupont, B. (1987). Multiple business starters. Who? Why? What? . *Journal of Small Business and Entrepreneurship*, 5, 48-63.
- Du Rietz, A., & Henrekson, M. (2000). Testing the female underperformance hypothesis. *Small Business Economics*, 14(1), 1-11.
- Eagly, A., & Wood, W. (1991). Explaining sex differences in social behavior: A meta-analytic perspective. *Personality and Social Psychology Bulletin*, 17(3), 306-315.
- Eisenhardt, K. (1989). Making fast decisions in high-velocity environments. *Academy of Management Journal*, 32(3), 573-576.
- Fredrickson, J., & Mitchell, T. (1984). Strategic Decision Processes: Comprehensiveness and Performance in an Industry With an Unstable Environment. *Academy of Management Journal*, 27(2), 399-423.
- Geoffee, R., & Scase, R. (1983). Business ownership and women's subordination: a preliminary study of female proprietors. *Sociological Review* 31(4), 625-648.
- Giacalone, R., & Rosenfeld, P. (1989). *Impression Management in the Organization*. Hillsdale, NJ: Erlbaum Associates.
- Gigerenzer, G., & Todd, P. M. (1999). Fast and Frugal Heuristics: The Adaptive Toolbox. In G. Gigerenzer, P. M. Todd & A. R. Group (Eds.), *Simple Heuristics That Make Us Smart*. New York, NY: Oxford University Press, Inc.
- Gigerenzer, G., Todd, P. M., & The ABC Research Group (1999). *Simple Heuristics That Make Us Smart*. New York: Oxford University Press.
- Glazer, R., & Weiss, A. (1993). Marketing in Turbulent Environments: Decision Processes and the Time-Sensitivity of Information. *Journal of Marketing Research*, 30(4), 509-522.
- Goffee, R., & Scase, R. (1985). *Women in charge: the experiences of female entrepreneurs*. London: George Allen and Unwin.
- Goleman, D. (2005). *Emotional Intelligence*. New York, NY: Bantam Books.
- Graham, B., & Dodd, D. (1934). *Security Analysis*. New York, NY: McGraw-Hill.
- Greene, P. G., Brush, C. G., Hart, M. M., & Saporito, P. (2001). Patterns of Venture Capital Funding: Is Gender a Factor? *Venture Capital*, 3(1), 63-83.
- Greenhaus, J., Parasuraman, S., & Wormley, W. M. (1990). Effects of Race on Organizational Experience, Job Performance Evaluations, and Career Outcomes. *Academy of Management Journal*, 33(1), 64-86.
- Hambrick, D. C., Geletkanycz, M. A., & Frederickson, J. W. (1993). Top executive commitment to the status quo: some tests of its determinants. *Strategic Management Journal*, 14(6), 401-418.

- Hersch, J., & Stratton, L. S. (1997). Housework, fixed effects, and wages of married workers. *Journal of Human Resources*, 32, 285-307.
- Hertz, L. (1986) *The Business Amazons*. London: Deutsch.
- Honjo, Y. (2000). Business failure of new firms: an empirical analysis using a multiplicative hazards model. *International Journal of Industrial Organization*, 18, 557-574.
- Kahneman, D., Slovic, P., & Tversky, A. (1982). *Judgment under uncertainty: Heuristics and biases*. Cambridge: The Press Syndicate of the University of Cambridge.
- Kalleberg, A. L., & Leicht, K. T. (1991). Gender and organizational performance: Determinants of small business survival and success. *Academy of Management Journal*, 34(1), 136-161.
- Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Englewood Cliffs, NJ: Prentice Hall.
- Kolvereid, L., & Bullvag, E. (Eds.). (1992). *Novices versus habitual entrepreneurs: an exploratory investigation*. Amsterdam: Elsevier.
- Koratko, D., Hornsby, J. S., & Naffziger, D. W. (1997). An examination of owner's goals in sustaining entrepreneurship. *Journal of Small Business Management*, 35(1), 24-33.
- Lankau, M. J., & Scandura, T. A. (2002). An Investigation of Personal Learning in Mentoring Relationships: Content, Antecedents and Consequences. *Academy of Management Journal*, 45(4), 779-790.
- Lerner, M., Brush, C., & Hisrich, R. (1997). Israeli women entrepreneurs: an examination of factors affecting performance. *Journal of Business Venturing*, 12, 315-339.
- Li, S., Schulze, W., & Li, Z. (2008). Plunging into the sea again? A study of serial entrepreneurship in China. *Asia Pacific Journal of Management*.
- Lowe, J. (1998). *Bill Gates Speaks: Insight From the World's Greatest Entrepreneur*. New York, NY: John Wiley.
- Manimala, M. J. (1992). Entrepreneurial Heuristics: A Comparison Between High PI (Pioneering-Innovative) and Low PI Ventures. *Journal of Business Venturing*, 7, 477-504.
- Matarazzo, J. D., & Denver, D. R. (Eds.). (2001) Corsini Encyclopedia of Psychology and Behavioral Science. New York: John Wiley & Sons.
- McClelland, D. C. (1965). N Achievement and Entrepreneurship: A Longitudinal Study. *Journal of Personality and Social Psychology*, 1 (4), 389-392.
- Minnitti, M., & Bygrave, W. D. (2001). A dynamic model of entrepreneurial learning. *Entrepreneurship Theory & Practice*, 25(3), 5-16.
- Mitchell, R. K. (1994). *Composition, Classification and Creation of New Venture Formation Expertise*. University of Utah, Salt Lake City, UT.
- Mitchell, R. K., Busenitz, L. W., Bird, B., Gaglio, C. M., McMullen, J. S., Morse, E. A., et al. (2007). The Central Question in Entrepreneurship Cognition Research 2007. [Survey Article]. *Entrepreneurship Theory & Practice*, 31(1), 1-27.
- Mitchell, R. K., Busenitz, L., Lant, T., McDougall, P. P., Morse, E. A., & Smith, J. B. (2002). Toward a Theory of Entrepreneurial Cognition: Rethinking the People Side of Entrepreneurship Research. *Entrepreneurship Theory & Practice*, 27(2), 93-105.

- Moore, D. P. (1990). An examination of present research on the female entrepreneur: Suggested research strategies for the 1990's. *Journal of Business Ethics*, 9(4/5), 275-281.
- Mudambi, R., & Zahra, S. A. (2007). The survival of international new ventures. *Journal of International Business Studies*, 38, 333-352.
- Naffziger, D. W., Hornsby, J. S., & Kuratko, D. F. (1994). A proposed research model of entrepreneurial motivation. *Entrepreneurship Theory & Practice*, 18(3), 29-42.
- Ng, T. W. H., Eby, L. T., Sorensen, K. L., & Feldman, D. C. (2005). Predictors of Objective and Subjective Career Success: A Meta-Analysis. *Personnel Psychology*, 58(2), 367-408.
- Pasanen, M. (2003). Multiple entrepreneurship among successful SME's in peripheral locations. *Journal of Small Business and Enterprise Development*, 10(4), 418-425.
- Politis, D. (2005). The Process of Entrepreneurial Learning: A Conceptual Framework. *Entrepreneurship Theory & Practice*, 29(4), 399-424.
- Powell, G. N. (1990). One More Time: Do Female and Male Managers Differ? *Academy of Management Executive*, 4(3), 68-74.
- Rae, D. (2005). Entrepreneurial learning: a narrative based conceptual model. *Journal of Small Business and Enterprise Development*, 12(3), 323-335.
- Rae, D., & Carswell, M. (2000). Using a life-story approach in researching entrepreneurial learning: the development of a conceptual model and its implications in the design of learning experiences. *Education and Training*, 42(4/5), 220-227.
- Rerup, C. (2005). Learning from past experience: Footnotes on mindfulness and habitual entrepreneurship. *Scandinavian Journal of Management* 21, 451-472.
- Reuber, A. R., & Fischer, E. (1999). Understanding the consequences of founders' experience. *Journal of Small Business Management*, 37(2), 30-45.
- Ronstadt, R. (1986). Exit, Stage Left: Why entrepreneurs end their entrepreneurial careers before retirement. *Journal of Business Venturing*, 1, 323-338.
- Rosa, P., & Scott, M. (1999). The prevalence of multiple owners and directors in the SME sector: implications for our understanding of start-up and growth. *Entrepreneurship & Regional Development*, 11, 21-37.
- Rosa, P., Carter, S., & Hamilton, D. (1996). Gender as a determinant of small business performance: Insights from a British study. *Small Business Economics*, 8, 463-478.
- Rumelt, R. (1982). Diversification Strategy and Profitability. *Strategic Management Journal*, 3(4), 359-369.
- Russell, J., & Adams, D. (1997). The Changing Nature of Mentoring in Organizations: An Introduction to the Special Issue on Mentoring in Organizations. *Journal of Vocational Behavior*, 51, 1-14.
- Sarasvathy, S., & Menon, A. (2002). Failing firms and successful entrepreneurs: Serial entrepreneurship as a simple machine.
- Schollhammer, H. (Ed.). (1991). *Incidences and determinants of multiple entrepreneurship*. Wellesley: Babson College.

- Schoonhoven, C., Eisenhardt, K., & Lyman, K. (1990). Speeding product to market: waiting time to first product introduction in new firms. *Administrative Science Quarterly*, 35, 177-207.
- Shane, S., Locke, E. A., & Collins, C. J. (2003). Entrepreneurial Motivation. *Human Resource Management Review*, 13(2), 257-279.
- Simmonds, P. (1990). The Combined Diversification Breadth and Mode Dimensions and the Performance of Large Diversified Firms. *Strategic Management Journal*, 11(5), 399-410.
- Simon, H. (1976). *Administrative Behavior: A Study of Decision Making Processes in Administrative Organizations*. New York: MacMillan Co.
- Simon, H. A. (1957). *Administrative Behavior; A Study of Decision-making Processes in Administrative Organization*. New York: MacMillan.
- Smilor, R. W. (1997). Entrepreneurship: Reflections on a subversive activity. *Journal of Business Venturing*, 12(5), 341-346.
- Smith, L. & Gilhooly, K. (2006). Regression Versus Fast and Frugal Models of Decision Making: The Case of Prescribing for Depression. *Applied Cognitive Psychology*, 20(2), 265-274.
- Starr, J., & Bygrave, W. (1991). The assets and liabilities of prior startup experience: an exploratory study of multiple venture entrepreneurs. Unpublished Working paper. Sol C. Snider Entrepreneurial Center, The Wharton School of the University of Pennsylvania.
- Sternberg, R. J. (Ed.) (2003) *Encyclopedia of Cognitive Science*. London, New York & Tokyo: MacMillan Publishers, Ltd.
- Sternberg, R. J., & Detterman, D. K. (1986). *What is intelligence? Contemporary viewpoints on its nature and definition*. Norwood, N.J.: Ablex.
- Suzuki, K.-i., Kim, S.-H., & Bae, Z.-T. (2002). *Technovation*, 22, 595-606.
- Ucbasaran, D., Wright, M., & Westhead, P. (2003). A longitudinal study of habitual entrepreneurs: starters and acquirers. *Entrepreneurship & Regional Development*, 15, 207-228.
- Van Praag, C. M. (2003). Business survival and success of young small business owners. *Small Business Economics*, 21, 1-17.
- Verheul, I., & Thurik, R. (2001). Start-up capital: 'Does gender matter?'. *Small Business Economics*, 16(1), 329.
- Vinnicombe, S. (1987). Drawing out the differences between male and female working styles. *Women in Management Review*, Spring.
- Westhead, P., & Birley, S. (1993). A comparison of new business established by 'novice' and 'habitual' founders in Great Britain. *International Small Business Journal*, 12(1), 38-61.
- Westhead, P., & Wright, M. (1998). Novice, portfolio and serial founders: are they different? *Journal of Business Venturing*, 13, 173-204.
- Whinston, M., & Green, J. (1995). *Microeconomic Theory*. Oxford: Oxford University Press.
- Winn, J. (2004). Entrepreneurship: not an easy path to top management for women. *Women in Management Review*, 19(3), 143-153.

Wright, M., Robbie, K., & Ennew, C. (1997). *British Journal of Management*, 8, 251-268.