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POPULATION LEVEL CONDITIONS AS  
SIGNALS OF ENTREPRENEURIAL  
OPPORTUNITIES: A COGNITIVE  
SYNTHESIS OF THE ENTREPRENEURIAL  
TRAITS AND POPULATION RATES  
PERSPECTIVES

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POPULATION LEVEL CONDITIONS AS SIGNALS OF ENTREPRENEURIAL  
OPPORTUNITIES: A COGNITIVE SYNTHESIS OF THE ENTREPRENEURIAL  
TRAITS AND POPULATION RATES PERSPECTIVES

By

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A Dissertation

Submitted in Partial Fulfillment of the Requirements for the  
Doctor of Philosophy Degree in Business Administration.

Department of Management  
In the Graduate School  
Southern Illinois University Carbondale  
December 2009

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DISSERTATION APPROVAL

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A Dissertation Submitted in Partial Fulfillment of the Requirements for the  
Degree of Doctor of Philosophy in the field of Business Administration

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July 8, 2009

## AN ABSTRACT OF THE DISSERTATION OF

Matthew S. Wood, for the Doctor of Philosophy degree in Business Administration, presented on July 8, 2009, at Southern Illinois University Carbondale.

TITLE: POPULATION LEVEL CONDITIONS AS SIGNALS OF ENTREPRENEURIAL OPPORTUNITIES: A COGNITIVE SYNTHESIS OF THE ENTREPRENEURIAL TRAITS AND POPULATION RATES PERSPECTIVES

MAJOR PROFESSOR: Dr. William McKinley

The ecology based environmental perspective implicitly suggests that population level founding rates, dissolution rates, and density levels influence the likelihood that entrepreneurs will launch new ventures within a given population domain. The central idea is that population rates and densities may act as signals to entrepreneurs regarding the viability of a new venture within a given population. Interestingly, whether or not population level factors actually influence the new venture creation process remains an open question. As such, the central purpose of this research is to utilize a cognitive approach to better understand how population level conditions and the individual differences of fear of failure and general self-efficacy influence entrepreneurs decisions to engage in entrepreneurial action.

This thesis proposes a model that integrates the population rates and entrepreneurial traits perspectives by focusing on entrepreneurs' hypothetical decisions to invest in entrepreneurial opportunities given differential levels of population factors. Because this research is focused on entrepreneurial decision making an experimental methodology using conjoint analysis was selected to test the theoretical model. Fifty seven experienced entrepreneurs participated in the conjoint experiment. Results revealed a significant main effect for founding rates, dissolution rates, and population density on the entrepreneur's decision to invest in an opportunity. Specifically, our results indicated that the entrepreneurs in our sample were more likely to invest in an opportunity when founding rates were high, dissolution rates were low, and density levels were low or moderate. We found limited support for the interaction of these variables. In terms of the individual difference variables, we found support for the influence of fear of failure, but no support for the effects of general self-efficacy on the investment decision. Specifically, entrepreneurs who indicated lower levels of fear of failure were

more likely to invest in the opportunity, while differential levels of general self efficacy did not enhance or reduce the probability of opportunity investment in a significant way.

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# CHAPTER 1

## INTRODUCTION

### 1.1 Overview and Research Question

New venture creation begins with the recognition of an entrepreneurial opportunity; followed by opportunity evaluation, and finally the decision to engage in the exploitation of the opportunity (Venkataraman, 1997). Entrepreneurial opportunity has been defined as the discovery of new means-ends relationships in which new goods, services, raw materials, and organizing methods are introduced to the market (Shane and Venkataraman, 2000; Casson, 2003; Compans and McMullen, 2006). The field of entrepreneurship has become increasingly focused on understanding the individuals that engage in entrepreneurship and its associated processes (Shane and Venkataraman, 2000). In an effort to understand how and why opportunity recognition and exploitation takes place, two traditional perspectives have emerged: one focusing on the personal attributes, traits, and behaviors of individual entrepreneurs, and the other focusing on the environmental conditions that foster the creation of new ventures (Romanelli, 1989; Aldrich and Wiedenmayer, 1993).

The first perspective is sometimes referred to as the “traits” approach and attempts to differentiate entrepreneurs from non-entrepreneurs using personal attributes (Aldrich and Wiedenmayer, 1993). An example of this approach is the work that has examined the influence of preferences for risk-taking (Brockhaus, 1980; Wu and Knott, 2006), need for achievement (McClelland, 1961; Collins, Hanges, and Locke, 2004), and the big five personality characteristics (Zhao and Seibert, 2006) on entrepreneurial behavior. The second perspective has been termed the “rates” approach and explores the factors that influence the composition of firms that make up a given population over long

periods of time (Aldrich, 1999). Researchers often accomplish this by looking at specific industries and the number of new firm's created, the number of existing firm's dissolved, and the overall density of ongoing firm's as indicators of the legitimated and competitive forces that shape the development of populations (e.g., Budros, 1994; Barnett and Freeman, 2001; Cattani, Ferriani, Negro, and Perretti, 2008).

The major shortcoming of the traits approach is that the entrepreneur becomes a unique individual whose role can only be assumed by those with the right background or personal characteristic. The major drawback of the rates approach is that it removes the entrepreneur from the equation by focusing on environmental conditions as the drivers of new venture creation and survival. Thus, it has been argued that a synthesis of the traits and rates perspectives may lead to valuable insights into the relationship between the immediate effects of individual characteristics and effects of long term population level dynamics (Aldrich & Wiedenmayer, 1993). In keeping with this idea, the main objective of this thesis is to utilize a cognitive approach in the integration of the traits and rates perspectives in order to understand the influence of population level conditions on individual entrepreneur's decision to invest in an entrepreneurial opportunity, and how the individual differences of fear of failure and general self-efficacy may alter that influence.

In exploring the relationship between population conditions and the evaluation of opportunities, the availability of valuable resources becomes an important issue. Stinchcombe (1965) argues that new organizations typically have limited access to labor, capital, and material markets which often restricts the ability to impact the environment they face. Moreover, new firms typically lack legitimacy because they have no track

record of producing exchange relationships (Hannan and Freeman, 1984). Alternatively, some have argued that despite these liabilities of newness, new organizations have distinct benefits over older organizations (Dowell and Swaminathan, 2006). In either case, it is important that entrepreneurs carefully evaluate the competitive landscape before starting a new venture (Romanelli, 1989). During the opportunity evaluation period, entrepreneurs often attempt to reduce the uncertainty and ambiguity associated with an opportunity by engaging in an extensive information search process (Rice, 2002). The information search phenomenon is consistent with the conceptualization that entrepreneurship can unfold as a logical sequence of exploration followed by exploitation activities (March, 1991; Aldrich 1999). The sequential perspective is reflected in the entrepreneurship research tradition that emphasizes the role of knowledge in the entrepreneurial process (e.g., Hayek, 1945; Venkatarman, 1997; Baron and Ensley, 2006).

From the rates perspective, organizational ecology based theories speak directly to the issues of resource availability, legitimacy, and competitive dynamics and their effects on new venture creation (Hannan and Freeman, 1989). Ecology models suggest that founding rates, dissolution rates, and population density may influence the likelihood that entrepreneurs will launch new ventures within a given population (Hannan and Freeman, 1989). The implicit idea is that these measures may provide signals to entrepreneurs about the availability of resources, the legitimacy of the exchange relationships, and the intensity of the competitive forces. Ecology theorists make the conceptual argument that when population level signals indicate a scarcity of resources, a lack of legitimacy, or intense competition, entrepreneurs are more likely to have

negative assessments of opportunities within this population. It is important to note that the relationship between population level factors and entrepreneurial behavior is merely implied, and not directly addressed, within the ecology literature (e.g., Carroll and Hannan, 1989, Barnett and Freeman, 2001).

Despite the implicit relationship discussed above, empirical research at the population level has revealed that, in some cases, even when organizational death rates are high or when population density is high, entrepreneurs are still likely to engage in new venture creation at a high rate (Budros, 1984; Dowell and Swaminathan, 2006). These findings suggest that entrepreneurs may not interpret population level signals in the way ecologist researchers have implicitly assumed. Interestingly, neither ecology nor entrepreneurship researchers have systematically investigated how entrepreneurs actually perceive opportunities under a variety of population level conditions. Moreover, they have not considered how individual trait differences may impact these perceptions. This thesis attempts to fill this gap by addressing the research question: how do differential levels of population density, new firm founding rates, and existing firm dissolution rates impact entrepreneurs' decisions to invest in an entrepreneurial opportunity and how do the entrepreneur's individual differences of fear of failure and general self-efficacy alter these decisions?

In addressing this research question, the important element is the perceptual nature of opportunity evaluation. An entrepreneur's evaluation of the desirability and feasibility of an opportunity is a cognitive process (Krueger and Brazeal, 1994). Thus, recent attempts to understand why some individuals see value in an opportunity, while others do not, increasingly rely on theories of entrepreneurial cognitions (e.g., Krueger,

2000). Entrepreneurial cognitions are defined as the knowledge structure that people use to make judgments, assessments, and decisions, regarding opportunity exploitation, venture creation, and growth (Mitchell et al., 2002). In this way, entrepreneurial cognitions provide a framework for understanding how entrepreneurs use knowledge to make judgments regarding the viability of opportunities. However, for entrepreneurship to take place, these judgments must ultimately be turned into action. McMullen and Shepherd argue that, “entrepreneurship requires one not just to decide, but to decide to act” (2006: 134). Thus, this research adopts an action based framework in order to understand how population level conditions influence entrepreneurs’ decisions to engage in entrepreneurship. This is accomplished by operationalizing the decision to engage in entrepreneurship as the willingness of the entrepreneur to invest in an opportunity given differential levels of population level conditions. To be clear, we use a cognitive framework as way to understand how entrepreneurs might use population level information to make judgments regarding the viability of opportunities. However, we do not directly attempt to measure cognitions, and instead, measure the decision to invest as the outcome variable from the cognitive processes associated with the evaluation of an entrepreneurial opportunity.

## **1.2 Anticipated Contribution**

Despite the potential relationship between organizational ecology and the field of entrepreneurship, there has been little integration of the ecology perspective into theories of entrepreneurship or vice-versa. For example, Carroll and Khessina (2005) examined all of the 2003 articles published in one of the premier entrepreneurship journals, *Journal of Business Venturing*. They report that 43 articles were published with a total citation count of 2,225 but only 59 (2.7%) of the citations were organizational ecology focused.



This lack of integration between the population focused ecology perspective and the individual focused entrepreneurship perspective is quite interesting, especially given the fact that changes in population rates (ecology) are thought to be directly related to the birth of new firms (entrepreneurship) (Hannan and Carroll, 1992; Budros, 1994; Carroll and Hannan, 2000).

The relationship between entrepreneurial activity and population rates has led some ecology theorists to consider the idea that population rates may act as signals, which indicate the viability of a new venture within a given population (Hannan and Carroll, 1992; Baum and Singh, 1994; Carroll and Khessina, 2005). For example, Hannan and Freeman (1989) posit that when a population nears its carrying capacity (high density) the supply of entrepreneurs interested in founding new firms will dwindle. Hannan and Carroll (1992: 42) argue that as a population grows “new entrepreneurs are enticed to enter the market.” Finally, Baum and Singh (1994) assert that entrepreneurs will be less likely to launch new ventures when the resource space is crowded (high density). In general, these conjectures are based on the logic that entrepreneurs will recognize different population level conditions as either conducive or not conducive to entrepreneurial action. However, to the best of this author’s knowledge, there have been no studies that specifically ask entrepreneurs for their evaluations of opportunities under different population level conditions. Simply put, there is no evidence that anyone has empirically tested whether population density, founding rates, and dissolution rates actually act as signals of entrepreneurial opportunities and how those signal impact entrepreneurial action within a sample of actual entrepreneurs.

The lack of investigation regarding the influence of population level conditions on entrepreneurial activity leads us to conclude that it is possible that entrepreneurs may not react to population level signals in the way the ecologists have implied. For example, it may be that high density levels do not signal resource scarcity and a lack of opportunity availability (Hannan and Freeman, 1989), rather they may be interpreted as a signal that there is a potentially large market that provides numerous opportunities for new venture creation. Because the strength and direction of these types of relationships has yet to be explored, this study provides a contribution to the literature because it begins the process of opening up the ecologists 'black box' of assumptions regarding the signals that population level conditions may provide to entrepreneurs considering new venture creation (Aldrich and Wiedenmayer, 1993; Carroll and Khessina, 2005; Eckhardt and Ciuchra, 2008). The importance of this type of investigation was recently highlighted by several scholars in both the field of organizational ecology and the field of entrepreneurship. Carroll and Khessina (2005: 173) state that, "to make theories and studies more useful to the entrepreneurship area, we suggest that analysts should attempt to conceptualize across the sequence of rates and work through the implications at the individual level." However, Aldrich and Wiedenamayer (1993: 155) have pointed out the difficulty associated with this integration and state that, "untangling the two interpretations of prior findings – as a symbol to entrepreneurs of potential opportunities and as an indication of already committed resources- is not an easy task, and prior research has not done so." They go on to argue that if ecology theories are properly integrated into studies of entrepreneurship it may provide new insights into the emergence of the enterprise. Thus, the unique contribution of this research is the

integration of the ecology perspective into a study of perceptual interpretation of opportunities, as indicated by the decision making responses of experienced entrepreneurs.

In addition to the theoretical contribution discussed above, this study is also expected to make an important methodological contribution. The integration of population level factors, individual differences, and their effects on the entrepreneurs decision to invest is difficult to empirically test as a naturally occurring event. As such, this study utilizes an experimental approach in order to test the integrated rates-traits-entrepreneurial action model. More specifically, a conjoint methodology has been selected to capture the perceptions of experienced entrepreneurs. A conjoint analysis is defined as “any technique that requires respondents to make a series of judgments based on specifically developed profiles provided by the researcher” (Shepherd and Zacharakis, 1997: 205). Based on the respondent’s judgments, each decision can be broken down to determine which of the presented factors (attributes) are the most important in arriving at the final decision. The advantage of this approach is that it overcomes many of the limitations associated with post-hoc techniques that require potentially inaccurate introspection (Aiman-Smith, Sculllen, and Barr, 2002). However, the major limitation to this approach is the potential for a low level of external validity, depending upon how the conjoint experiment is conducted (Hair et al., 2006).

Conjoint analysis has proven to be quite useful in understanding decision making in fields such as marketing (Hair et al., 2006). As such, Shepherd and Zacharakis (1997) argue that conjoint analysis can greatly advance the field of entrepreneurship by providing a method to generate new insights into how entrepreneurs make decisions.

Unfortunately, only a few researchers have taken heed of the Shepherd and Zacharakis (1997) argument and the application of conjoint analysis to entrepreneurship focused research questions has remained rather limited (see Choi and Shepherd, 2004 as a notable exception). Because this study seeks to understand how entrepreneurs use population level conditions in the decision to engage in entrepreneurial action, the conjoint approach offers useful insights that are unachievable using post-hoc methodologies, such as surveys (Hair et al., 2006). In this case, conjoint analysis allows us to calculate the specific weights that each respondent placed on each attribute (entry rates, dissolution rates, and density levels) while making the decision to engage in entrepreneurial action (decision to invest in the opportunity).

The results of this study represents an initial step in the identification of which population level factors are the most important determinates of entrepreneurial action and how differential levels of each factor influence the investment decision. While our research is primarily designed as a scholarly contribution, this study may provide nascent and practicing entrepreneurs with important insights regarding which population level factors warrant close attention and how those factors act as signals to engage in (or refrain from) entrepreneurial activity. Thus, entrepreneurs may be well advised to carefully consider population level signals when evaluating a potential entrepreneurial opportunity. By placing the population rate signals within the broader context of the entire information set available, entrepreneurs may be able to use population level information in a discerning way, thereby increasing the odds of prudent new venture investment.

## **CHAPTER 2**

### **LITERATURE REVIEW**

The ecology based literature and the entrepreneurship literature have developed with very little overlap. As such, it necessary to review each of these literatures with a focus on gaining insights into how each informs the other. In what follows, I will endeavor to provide a more complete picture of the development of the existing knowledge in both the ecology based perspective and theories of entrepreneurship.

#### **2.1 Population Rates and Densities from an Ecological Perspective**

The ecological perspective is a macro level view that has emerged from organizational sociology to become an important paradigm for the analysis of organizations at the population level. The ecology school applies concepts from models of population biology in order to explore the rates of organizational births, deaths, and density levels that drive population demographics (Hannan and Freeman, 1977; Aldrich, 1979; Baum, 1996; Dowell and Swaminathan, 2006). To the ecologist, births and deaths become the keys to population change (Hannan and Freeman, 1977). Ecologists also attempt to explain organizational change by focusing on the availability of environmental resources within a given population of organizations (Aldrich and Wiedenmayer, 1993). A population has been defined as a set of organizations engaged in similar activities with similar patterns of resource utilization (Hannan and Freeman, 1977; 1989), and is usually operationalized as the industry (e.g., Barnett and Freeman, 2001; Dowell and Swaminathan, 2006). Ecological models are based on the idea that some organizations – although they do not identify which ones in an a-priori manner - have greater access to environmental resources and organizations that lack access to the appropriate resources

will die out. The ecological approach downplays the adaptive potential of organizations by arguing that organizational change is attributable to resource flows throughout the economy and not to internal managerial action (Astley and Van de Ven, 1983, Astley, 1985). In this way, the ecological perspective asserts that organizational change is achieved at the population level by way of survival of the fittest, which is often the most reliable and accountable organizations.

Within the management domain, ecological theories are based largely on the key contributions of Campbell (1969), Hannan and Freeman (1977), Aldrich (1979), and others. Campbell's (1969) work on the nature of creative ideas helped to introduce the constructs of variation, selection, and retention to the budding field of organizational ecology. Some ecologists, such as Aldrich (1979) began to use the variation, selection, and retention model to explain changes in organizational population demographics over time. In terms of the variation construct the ecology perspective asserts that any type of change is variation, and the change may be internally or externally driven and may be intentional or not. Interestingly, the ecology perspective is not necessarily concerned with the source of variation (e.g., Hannan and Freeman, 1977); rather it simply acknowledges that variation naturally occurs. It is important to note that the variation aspect of the ecology model is not necessarily widely adopted into some of the major streams of research. For example, Hannan and Freeman (1977) adopt the selection portion of the model as a justification for using the population as the unit of analysis, while mostly ignoring the role and source of variation. In contrast to Hannan and Freeman (1977), and more consistent with Aldrich (1979), entrepreneurship scholars have argued that environmental variations, caused by market disequilibrium, play a key

role in the production of entrepreneurial opportunities (Schumpeter, 1934; Kirzner, 1979; Jacobsen, 1992; Klein, 2008). It is generally thought that some entrepreneurs are able to recognize environmental change and actively seek to exploit the opportunities created by shifts in the environment (Eckhardt and Ciuchta, 2008). Alternatively, some entrepreneurs are likely to stumble upon opportunities and resources without a conscious understanding of the source of the opportunity. In general, higher levels of environmental variation are thought to lead to greater opportunities for new firm creation and organizational change (Schumpeter, 1934; Aldrich and Wiedenmayer, 1993, Alvarez and Barney, 2005).

Because environmental variations place new resource demands on established organizations and new firm entries, differential access to key parts of the resource space lead to the second ecological concept: selection. Selection is a function of market forces, competitive pressures, resource availability, organizational structure suitability, legitimacy and other similar forces (Carroll and Hannan, 2000). Organizations not well suited to deal with these selection forces will eventually die out, while organizations that are well suited will thrive. Over time, populations of organizations will be characterized by the attributes of the organizations that were selected and the attributes of the organizations that died out will become irrelevant (Aldrich, 1979). In this way selection mechanisms provide an avenue for the isomorphism of populations, where surviving organizations begin to look more and more alike over time.

Retention is the third important attribute in much of the ecology literature (e.g., Aldrich, 1979) because it provides a mechanism for the transfer of managerial and technological competence that the majority of organizations use. Populations can be

characterized by the competencies held by owners, managers, and employees. As such, retained characteristics from surviving organizations are diffused throughout the population of new and old organizations, as well as to old and new employees and managers (Zimmer and Aldrich, 1987). Linkages between organizations within a population either enable or prohibit the diffusion of retained variations (Cattani et al., 2008). This is important because the survival of a population is dependent upon the collective managerial and technical competence held by the members of the population.

The ecological perspective provides a coherent theory that explains how particular forms of organizations prevail in specific kinds of environments (Aldrich and Wiedenmayer, 1993). However, just because a form persists in a specific environment does not mean that it is the fittest form available, and may be vulnerable to the introduction of new competition that provide a better environmental fit (Carroll, 1983; Haveman, 1992; Budros, 1994). For example, Dowell and Swaminathan (2006) looked at the U.S. bicycle industry and found that firms entering the industry early in its history often utilize organizational processes and organizational forms that become maladapted as the industry matured. Thus, even though the early entrants persisted for a period of time, they began to die out as better equipped firms were introduced into the industry. These findings are consistent with Stinchcombe's (1965) argument that firm's who enter the population at the early stages face the "liability of newness" problem and these liabilities often lead to organizational failure over the long term.

Based on the arguments outlined above, we believe that the ecological model is highly applicable in the exploration of entrepreneurial opportunities, as it attempts to explain the processes associated with new venture creation. More specifically, the



ecological perspective focuses on the rates of firm foundings, population densities, and the rates of existing firm dissolutions within various populations. Because the goal of this research is to understand the relationship between specific population rate characteristics and entrepreneurs decisions to invest in entrepreneurial opportunities, it is important to dig deeper into the ecology literature's perspective on the role of founding rates, dissolution rates, and population density in the entrepreneurial process. However, it is important to note that many ecology based studies consider population rates to be dependent variables (e.g., Carroll and Hannan, 1989). Essentially, these studies often look at the effects of previous foundings or previous dissolutions on current founding or dissolution rates. However, our research takes the perspective posited by an alternate group of scholars who suggest that population rates may act as independent variables which influence entrepreneurs' decisions to create new ventures (Delacroix and Carroll, 1983; Swaminathan and Delacroix, 1991; Aldrich and Wiedenmayer, 1993; Dowell and Swaminathan, 2006). Thus, as we move forward to discuss founding rates, dissolution rates, and population densities we are doing so from the perspective that these rates are independent variables that influence the likelihood of entrepreneurial action. Moreover, we only explore the influence that these factors may have on new venture creation, which is a component of future founding rates. Thus, we do not consider the effect that these factors may have on existing firm dissolutions or on overall population density levels.

### **2.1.1 Founding Rates**

One of the key drivers in determining shifts in a population of organizations is the rate at which new organizations are founded (Hannan and Carroll, 1992). Exploring the founding rates of populations is important because it directly relates to the processes of legitimation and competition, which is often used to explain why changes in populations

occur (e.g., Hannan and Freeman, 1987). Generally speaking, ecologists argue that it is the positive influence of legitimation and the negative effects of competition that determine the rate of new venture foundings. For example, Hannan and Carroll (1992) argue that in the early stages of population development an increase in the number of firms increases the legitimacy of organizational activities, and in so doing a more favorable business environment is created. However, as more and more firms enter the industry the increased competition leads to resource scarcity, which makes it difficult for existing firms to thrive and even more difficult for new firms to survive. As such, it ecologists assume that rational actors would shy away from engaging in venture creation under conditions of intense competition. However, it should be noted that, at the population level, support for this argument is limited. For example, one possible indicator of noxious competitive forces is likely to be high levels of population density or high dissolution rates within the population (Delacroix and Carroll, 1983). Referring to the later indicator, we would expect to see that as dissolution rates rise the number of new firm foundings would decrease, as entrepreneurs become aware of the intense competitive forces at work. However, Barnett and Freeman's (2001) study of the semiconductor industry revealed that this may not necessarily be the case. These researchers found that even when many firms were exiting the industry, there were still a substantial number of firms entering the industry. This is interesting, given the rational actor assumption. Perhaps entrepreneurs do not view firm deaths as a sign that there are too many competitors in the industry, but rather that resources are not being used to the maximum utility and an increase in exits provides an opportunity for obtaining resources at a discount. Delacroix and Carroll's (1983) study of the newspaper industry in

Argentina and Ireland provides support for the maximum resource utility argument. These researchers found that, in some cases, the dissolution of newspapers freed up key resources for the founding of new newspapers that were better fit to the current environment. In addition to the resource availability argument, it may also be that entrepreneurs ignore the negative signals high exit rates may provide because they feel they can build a better “mouse trap” or simply feel that they have greater skills and knowledge (self-efficacy) than those involved in the firms that are exiting the population. At present, this question remains largely unresolved.

The ecology perspective takes the position that the current and previous number of new firm foundings has a significant effect on future foundings (Hannan and Carroll, 1992; Budros, 1994; Barnett and Freeman, 2001; Cattani et al., 2008). The idea is that founding rates provide a perceptual signal about the opportunity structure and the current drain on important resources required for new venture creation. Depending on the direction of opportunity signal, entrepreneurs and existing firms may be encouraged or discouraged from entering the population. For example, high levels of prior foundings may be interpreted as a signal of opportunity availability and potential entrepreneurs may be encouraged to mimic the actions of other entrepreneurs. In this way, we would anticipate a strong positive relationship between current and subsequent founding rates. Alternatively, high levels of prior foundings may lead to the perceptual conclusion that the resource space is overcrowded and the newcomer would have a great deal of difficulty securing the necessary resources to ensure survival. The anticipated outcome of this perception would be a negative relationship between prior foundings and subsequent new venture creation.

The potential relationship between prior founding rates and the subsequent creation of new ventures puts empirical researchers in the position of having to uncover a curvilinear relationship. Delacroix and Carroll (1983) explored the relationship between prior organizational births and subsequent foundings in the newspaper industry and found the anticipated u-shaped relationship. Hannan and Freeman (1987) found similar results in their empirical examination of labor unions. Staber (1989) looked at a several populations of cooperatives and also found a u-shaped relationship between the number of prior founding and the subsequent creation of new ventures in two of the three populations studied. Carroll and Hannan (1989) studied eight different populations of newspapers and found that the same curvilinear relationship existed in only five of the eight populations. Finally, Aldrich, Zimmer, Staber, and Beggs (1990) explored a population of trade associations and did not find a significant curvilinear relationship and concluded that prior foundings were not an important influence on subsequent foundings within this population.

One of the few empirical studies to move away from the previous foundings-subsequent foundings perspective is a unique study by Baum and Haveman (1997). This study of the hotel industry directly addressed the explicit relationship between population level founding rates and entrepreneurship. These researchers take a relational approach and look at where newly created firms locate themselves in the resource space. They ask how similar the new firms are to their closest neighbor. In so doing, they explore key entrepreneurial decisions, such as the product offering and the geographic location, in relation to the existing firms in the market. They found that the new entrants did seek to avoid direct competition with similar hotels and were more likely to attempt to position

themselves within a complimentary market. However, it is worth noting that Baum and Haveman (1997) did not collect data from entrepreneurs regarding their perceptions or decision making, rather they inferred entrepreneurial behavior from population level data.

The results of the conceptual and empirical studies outlined above provide limited support for the relationship between prior foundings and the propensity of entrepreneurs to engage in subsequent new venture creation. On one hand, it is likely that high founding rates lead to resource claims that diminish the possibility of future opportunities within the population. However, this may only be true at later stages of population development. In the early stages of population development, resources may be plentiful and entrepreneurs may focus more on the influx of new ventures as legitimacy and opportunity indicators, as opposed to an indicator of resource constraints. To date, researchers have not sufficiently examined the perceptions or decision making processes of entrepreneurs in relation to differential levels of founding rates. Aldrich and Wiedenmayer (1993) highlight this by arguing that researchers have yet to untangle the interpretations of prior foundings as a symbol to entrepreneurs of potential opportunities. We would argue that this is primarily an artifact of the ecology approach. Very few ecology researchers are interested in individual level perceptions and their data is collected at the population-level, which provides few insights into entrepreneurial behavior. This is one reason that entrepreneurship researchers are in a unique position to begin the process of uncovering the relationship between population rates and the perceptions of entrepreneurs. Thus, in keeping with the previously stated objective for this study, we consider the idea that differential levels of new firm foundings within a

given population will have a significant impact on entrepreneurs' decisions to invest in an opportunity.

### **2.1.2 Dissolution Rates**

Another key driver in determining vitality rates and shifts in a population of organizations is the rate at which existing organizations are dissolved (Hannan and Carroll, 1992). The degree of competition within a specific population is thought to be positively related to the number of existing firms exiting the population (Hannan and Carroll, 1992). As the level of competition increases, vital resources become scarce and many organizations struggle to survive. Once competition has reached a high degree of intensity, further growth in the population results in an increase in the number of firm exits. Similarly, it has been argued that intense competition during the start-up phase of new ventures can have long lasting detrimental effects on the firm (Stinchcombe, 1965). The energy and attention that is continually spent on resource acquisitions leaves little time for refinement of the organizational structure and skills. The scarce resource environment also pushes new firms to the edge of the resource space, which forces them to compete in very narrow niches. Constraining the firm to a narrow niche leaves little room for growth; thereby reducing the firms long term odds of survival. It is worth noting that the relationship between competition, resource availability, and dissolutions that Stinchcombe (1965) and others argue is based on the assumption of a fixed resource base. As such, it may be that the resource space is malleable and can be expanded (e.g., marketing efforts), but it appears that the ecological perspective pays little credence to this notion. Rather, ecology theory asserts that because the resource space is fixed, more competition leads to fewer resources which results in higher dissolution rates.

Dissolution rates become an important consideration because large numbers of firm exits are thought to directly impact the formation of new organizations. On one hand, they may enhance new venture creation by freeing up vital resource and creating space in the niche. Alternatively, dissolutions may discourage entrepreneurs from engaging in new firm development, especially early in the new venture development process. Aldrich and Wiedenmayer (1993) have posited that it is likely that potential entrepreneurs may be frightened by high dissolution rates. More specifically, the authors assert 'high numbers of dissolutions are a signal, perhaps, that the population has exceeded its carrying capacity' (Aldrich and Wiedenmayer, 1993, p.152). If these assertions are correct, we would expect to see a relationship between the number of dissolutions and subsequent new firm foundings, such that as the number of dissolutions increase, entrepreneurs would see this as a signal of an overcrowded resource space and be discouraged to enter the population.

Delacroix and Carroll (1983) explore the relationship between dissolution rates and the creation of new firms using populations of newspapers in Argentina and Ireland. They discovered that the relationship was a complex pattern, but dissolutions in one period were related to foundings in later periods. As death rates increased, subsequent foundings also increased up to a point, but then began to decrease with a continued increase in death rates. The researchers assert that there are two mechanisms driving these findings: (1) initial deaths freed resources that created opportunities for entrepreneurs to start new papers, and (2) as the death rates continued to climb entrepreneurs became increasingly leery of the prospect of starting a new paper. It appears that, eventually, the negative perceptions overwhelmed the positive implications

of resource availability. However, it should be noted that Delacroix and Carroll's (1983) conjectures regarding entrepreneurs are purely anecdotal. At no point did the researchers collect data from individual entrepreneurs regarding their perceptions of the relationship between dissolution rates and opportunities for starting new papers. As such, we do not have the required data to understand exactly how dissolution rates impacted the decisions of entrepreneurs who were considering launching a new venture within this population.

In a related study, Carroll and Huo (1986) looked at nine newspaper populations, some of which were included in the Delacroix and Carroll (1983) study, and found strikingly different results. The relationship between dissolutions and subsequent foundings were statistically significant in only one of the newspaper populations. Halliday, Powell, and Ganfors (1987) found that prior dissolutions were negatively related to subsequent foundings in a population of state bar associations. Aldrich, Zimmer, Staber, and Beggs (1990) also tested for the relationship in a population of trade associations and found that prior dissolutions were not associated with subsequent foundings. Finally, Carroll and Hannan (1989) investigated the rate at which existing organizations disbanded in the semiconductor industry. Their analysis indicated that as population density increased, the number of dissolutions also increased, which resulted in a decrease of new firm entries. Collectively, these findings provide some support for the notion that as dissolution rates increases, the potential for entrepreneurial activity may decrease within a specific population.

Overall, the ecology based literature that focuses specifically on the dissolution of existing firms is rather limited and often reports contradictory findings, which is likely an artifact of the complex relationship that exist between dissolutions and the creation of



new ventures. Thus, it seems appropriate to move beyond the population level and explore the actual perceptions of entrepreneurs. How do entrepreneurs actually interpret differential levels of dissolutions? Is it viewed as a resource driven opportunity or as a signal to stay out of a saturated market? To date, researchers have not engaged entrepreneurs in efforts to uncover their true perceptions of the relationship between dissolution rates and opportunity availability. Based on the stated objectives of this study, we seek to provide insights on the relationship between the population's dissolution rates and entrepreneurs' decisions to invest in an entrepreneurial opportunity.

### **2.1.3 Population Density**

The density dependence model was originally developed in a technical report by Hannan (1986) who asserted that several population processes are a function of the actual size of the population itself. Density is defined as the number of organizations within a population and is often operationalized in terms of industry membership (Aldrich, 1990). The density dependence model asserts that population density is directly related to two underlying processes: legitimation and competition. Both underlying processes are thought to play an important role in the establishment and survival of new ventures. Legitimacy is thought to be positively related to density, such that as the number of firms in a population increases, the population is seen as more legitimate. In conjunction with increased legitimacy comes the institutionalization of work practices, the sharing of knowledge, and increases in valuable skills (Aldrich, 1990; Hannan and Carroll, 1992; Budros, 1994; Dowell and Swaminathan, 2006; Han, 2007). In this way, an increase in the number of firms within the population can be seen as a positive for the firms in the

industry and for those looking to enter it, because it helps to increase the legitimacy of the population, which increases the odds of organizational survival.

However, the positive effect of legitimacy has a limit. As new firms are added to the population the rate at which legitimacy is improved begins to decline and the effects of competition begin to accelerate. Once density reaches a certain point the effects of increased competition begin to dominate and adding new firms results in a fierce battle for resources and niche space. Thus, ecologists often argue that at very high levels of density the incentive to start a new venture is likely to be very low (Halliday et al., 1987; Aldrich, 1990; Han, 2007; Sarasvathy et al., 2008). This leads to the conceptualization that the relationship between density and the rate of new firm foundings is an inverse U-shaped pattern (Hannan, 1986; Singh and Lumsden, 1990). As such, there are potentially positive or negative effects of density and we must consider each in terms of their potential effect on entrepreneurial action.

In order to conceptualize that increasing density is actually good for the survival of firms, one must assume that there is a relationship between the number of firms and the taken for granted nature (legitimacy) of the population. Support for this argument often relies on the work of Carroll and Hannan (1989) who reported that in six of nine newspaper populations the relationship between density and new firm creation was, indeed, an inverse U-shaped pattern. Similarly, Aldrich et al. (1990) explored the density-foundings relationship in a population of trade associations and they also found support for the density dependence model. In this population, foundings increased as density increased but then decreased as density reached higher levels. Halliday et al. (1987) explored bar association foundings and reported that foundings increased at an

increasing rate as the population of bar associations grew, even when controlling for increases in the number of lawyers available to participate in the associations. This is interesting, because logic would suggest that as the number of established bar associations increased, there would be less incentive to start a new association, assuming all else is held constant. Barnett and Amburgey (1990) also explored the density dependence model in a study of telephone company foundings, but did so by measuring density as the number of firms and aggregate size of the market (total subscribers of all companies). They found a negative relationship between the number of companies and foundings, but a positive effect between the total number of subscribers and foundings; indicating that market size may be just as important as firm density, a phenomenon sometimes referred to as “mass dependence” (Singh and Lumsden, 1990).

Generally speaking, the empirical support for the density dependence model is relatively strong. However, there have been several areas of divergent findings, some of which are thought to be the result of research design issues, including the potential for exclusion of key intervening variables such as industry regulation. Budros (1994) attempted to reconcile some of the conflicting results of various empirical studies focused on density dependence arguments. He postulated data exclusion, competition effects, geography, cross-industry effects, organizational size, and economic versus ecological explanations as six possible reasons for the variation in the outcomes of the empirical studies. He used a data set that focused on life insurance companies within the state of New York and outside the state of New York during the period between 1842 and 1904. While he never directly measured competition, he argued that the results of the study indicated that increased competition led to an initial increase in foundings, but did not

restrict foundings later in the industry life cycle. This finding is partially counter to Hannan and Carroll's (1992) theoretical assertion that increased density would lead to decreased foundings in the high density stages of the industry cycle.

Collectively, the conceptual and empirical literature on the ecology based factors of population density, founding rates, and dissolution rates point to a relationship between population rates and entrepreneurial activity. However, this literature is focused on macro-level trends and does not specifically investigate the relationship between population level conditions and entrepreneurs decisions to invest in an entrepreneurial opportunity. Because the objective of this research is based on the investigation of this relationship, the discussion must shift to what the existing entrepreneurship literature posits in regards to how external information may influence the exploitation of entrepreneurial opportunities.

## **2.2 Environments, Individual Traits, and Entrepreneurial Opportunities**

In the ecology literature there is an implicit relationship between population level dynamics and entrepreneurship. More specifically, it is implied that founding rates, dissolution rates, and population density may provide signals to entrepreneurs regarding opportunities for new venture creation. But, in moving from the population level to the individual entrepreneur, it becomes clear that the ideas of opportunity discovery, evaluation, and exploitation are far more complex than the picture painted by ecology theorists. Entrepreneurial opportunity has been defined as the discovery of new means-ends relationships in which new goods, services, and organizing methods are introduced to the market (Shane and Venkataraman, 2000; Casson, 2003; Companys and McMullen, 2006). Potential for engaging in opportunity recognition and exploitation has traditionally been examined in terms of (1) the environmental conditions that create a

favorable context for entrepreneurial activity, or (2) characteristics of entrepreneurs thought to be related to entrepreneurial action (Romanelli, 1989). The second perspective, in particular, is focused on understanding why some people, and not others, recognize and act on opportunities for entrepreneurship. Because this research is investigating the influence that population rates (environmental conditions) may have on the individual's decision to engage in entrepreneurship we also need to consider the individual characteristics line of research, which we now review in detail.

### ***2.2.1 Individual Traits and Entrepreneurial Opportunities***

Research on the role of the individual entrepreneur is often based on the key assumption that entrepreneurs are fundamentally different from non-entrepreneurs (Shane 2003). Based on this assumption, one specific line of research has explored the idea that personality traits are what differentiate entrepreneurs from the rest of the population. Personality traits are defined as a disposition to respond in a certain way across various situations (Caprana and Cervone, 2000) and are considered to be stable and enduring over time (Rauch and Frese, 2007). As such, researchers have considered numerous individual difference factors as potential predictors of entrepreneurial behavior. For example, preferences for risk-taking (Brockhaus, 1980; Wu and Knott, 2006), need for achievement (McClelland, 1961; Collins et al. 2004), need for autonomy (Hornaday & Aboud, 1971; Cromie, 2000), and the big five personality characteristics (Zhao and Seibert, 2006) are just a few individual traits that have been empirically investigated in entrepreneurship models. In a similar vein, sociologists have focused their attention on the socio-economic backgrounds of entrepreneurs as factors influencing entrepreneurship. Factors such as parent's income and occupation (Mosakowski and

Carroll, 1985), gender (Cromie, 1987), ethnicity (Light, 1972), and entrepreneurial parents (Collins and Moore, 1970) have been explored as correlates of entrepreneurial activity. The basic premise behind this line of research is that specific demographic characteristics can be used to predict entrepreneurial behavior.

Despite the numerous studies and extensive literature, empirical support for the trait based model of entrepreneurship has been mixed (see Stewart and Roth, 2001; Zhao and Siebert, 2006; Rauch and Frese, 2007 for recent reviews). Take, for example, the extensive research on need for achievement which has shown that entrepreneurs often rate higher on this trait than other professionals (Herman et al., 2007). Need for achievement has also been shown to correlate with business success, but the relationship is generally weak (Collin et al. 2004). In contrast, another group of researchers have suggested that the need for achievement trait has not been useful in the study of entrepreneurial action (Litzinger, 1965; Brockhaus, 1980; Koh, 1996). More generally, Gartner (1985) argued that entrepreneurs are a very heterogeneous group and the identification of the “average entrepreneur” is unlikely and an average personality profile of entrepreneurs will be difficult to determine. Low and McMillan (1988) posit that descriptive studies based on personality do not help to develop a theory of entrepreneurship. Likewise, Aldrich (1999) conducted an extensive critical review of the trait based literature and concluded that “research on personality traits seems to have reached an empirical dead end” (1999: p.76). Despite Aldrich’s claim, research using individual traits has continued (e.g., Stewart and Roth, 2001; Zhao and Siebert, 2006), however the current trend is for traits to be considered as moderating variables, rather

than independent variables, in entrepreneurial models (e.g., Mitchell, 2006; Holt et al., 2007; Gupta and Bhawe, 2007).

Taken independently, the environmental perspective and the individual trait perspective have proven to be problematic in their ability to identify the conditions and processes that lead to opportunity recognition and exploration. The shortcoming of these perspectives leaves researchers in a difficult spot. Obviously, environmental conditions impact the formation of new businesses and not all entrepreneurs are created equal. Busenitz et al. (2003) conducted a thorough review of entrepreneurship research and concluded that researchers should focus on the exploration of the nexus of opportunities, enterprising individuals, and the wider environment. Interestingly, Romanelli (1989) made a similar assertion, over a decade earlier, by arguing that part of the answer to the question of why only certain individuals engage in entrepreneurship may very well lie in the study of individual differences. However, understanding the conditions under which new business are founded requires the exploration of how opportunities arise and why, given the same conditions, some people see opportunities where others do not (Romanelli, 1989). In sum, many entrepreneurship scholars agree that it is important to integrate individual differences into models that explore environmental variables. Consistent with this notion, we consider individual trait differences as potentially influential variables in our exploration of the impact of ecological factors on the decision to invest in an entrepreneurial opportunity. The integration of the environmental perspective and the individual trait perspective is achieved by way of a cognitive approach to opportunity recognition. As such, the literature on entrepreneurial cognitions will be reviewed.

### **2.3 Cognitive Approach to Entrepreneurial Opportunity Recognition**

The cognitive approach to entrepreneurship can be considered an outgrowth of the previously discussed trait-based research. Research using individual traits as predictors of entrepreneurial behavior began to decline in the 1990s, but entrepreneurship scholars continued to wrestle with the empirical observation that the behavior of entrepreneurs appeared to be fundamentally different from non-entrepreneurs. The cognitive approach emerged in the late 1980s and has proven to be a useful theory for the explanation of the role of individual differences in the entrepreneurial process (Palich and Bagby, 1995; Mitchell et al., 2002). Entrepreneurial cognitions are defined as the knowledge structure that people use to make judgments, assessments, and decisions, regarding opportunity exploitation, venture creation, and growth (Mitchell et al., 2002). As such, entrepreneurial cognitions become important because opportunity evaluation is subjective to the individual and this approach provides insights into how entrepreneurs evaluate alternatives presented to them (Krueger, 1993).

The central focus of the cognitive approach is the way in which entrepreneurs gather, process, and evaluate information (Allison, Chell, and Hayes, 2000). Early work in this area considered cognitive biases in strategic decision making (Busenitz, 1992) and entrepreneurial action (Kruger, 1993). For example, Cooper, Woo, and Dunkelberg (1988) found that entrepreneurs often exhibit cognitive biases in favor of their chances for success. Specifically, the researchers found that 81 percent of the entrepreneurs felt that their venture had a 70 percent chance of success, despite the knowledge that 70 percent, or more, of new ventures dissolve before the five year mark. Jackson and Dutton (1988) explored how strategic decision makers used cognitive schemas to discern between threats and opportunities. They found that both threats and opportunities have



distinct characteristics that are identifiable by decision makers. They also found that decision makers were more likely to react to a perceived threat than to a perceived opportunity. In a similar vein, Mitchell (1994) built on the biases and heuristic based cognitive research and used entrepreneurial cognitions to distinguish entrepreneurs from non-entrepreneurs, followed by Baron (1998) who argued that cognitive mechanisms, such as attributional style, planning fallacy, and self-justification, may be useful in explaining the unique behaviors of entrepreneurs.

An interesting outcome of the early cognition work in entrepreneurship is that it began the process of altering the underlying research assumption of full rationality to one of bounded rationality (e.g., Simon, 1979). In the bounded rationality perspective, it is assumed that entrepreneurs only have access to a limited amount of information, and thus can only partially reduce the uncertainty associated with the decision to engage in entrepreneurship. Following this logic, many of the more recent approaches to entrepreneurial cognitions consider the idea that as individuals engage in opportunity identification and exploitation, assumptions of full rationality quickly break down (Shepherd et al., 2007; Mitchell et al., 2007). Examples of these modern approaches are: heuristic-based logic, entrepreneurial alertness, entrepreneurial expertise, and action-based frameworks.

The heuristic-based logic approach argues that individuals and situations can be differentiated based on the extent to which decision shortcuts are used (Busenitz and Barney, 1997). The main idea is that heuristics may enable entrepreneurs to more quickly make sense of uncertain and complex situations, which leads to better interpretations of entrepreneurial opportunities. The alertness approach was originally

developed by Kirzner (1979) and suggests that some individuals are more attentive to opportunities than others. To date, empirical research on the alertness approach is limited and findings have been mixed. The entrepreneurial expertise perspective is based on the idea that entrepreneurs develop unique knowledge structures that allows them to process information differently than non-entrepreneurs (Mitchell, 1994; Shepherd et al., 2007). Here, the argument is that entrepreneurs become experts in their domains which allow them to develop expert scripts, resulting in superior information processing. Currently there is some empirical support for the entrepreneurial expertise approach (Busenitz, 1992; Busenitz and Barney, 1997; Gustavsson, 2004).

#### **2.4. Cognitions and Entrepreneurial Action**

Building on the entrepreneurial cognition research discussed above, McMullen and Shepherd (2006) have recently proposed an action based framework as a way to understand entrepreneurs' cognitive evaluations of opportunities. More specifically, they argued that most opportunity focused theories of entrepreneurship are, at their core, theories of action. Thus, opportunities cannot be discovered or constructed without individual entrepreneurial action. They define entrepreneurial action as "behavior in response to a judgmental decision under uncertainty about a possible opportunity for profit" (McMullen and Shepherd, 2006, p.134). From this perspective, what is important in the opportunity evaluation process is the decision to act.

McMullen and Shepherd's (2006) action based theory was originally conceptualized as a two stage model: opportunity attention and opportunity evaluation. Opportunity attention refers to third person opportunities and considers questions of why opportunities are recognized and exploited in general. Opportunity evaluation is the

second stage, and the premise for this study, and refers to first person opportunities. First person opportunities have to do with questions of why opportunities are recognized and exploited by specific individuals. The opportunity evaluation stage of the model suggests that entrepreneurs are individuals who must make judgments regarding the desirability and feasibility of an entrepreneurial opportunity (Krueger, 1993). In this way, enterprising individuals must envision a future state and then make judgments as to whether or not the desired future is attainable (Shackle, 1979). In this research, the action based framework is adopted because it provides a mechanism by which these judgments, and the corresponding perceptions of opportunities, can be captured. Thus, it is the entrepreneur's decision to engage in entrepreneurial action that provides an empirical indicator in our investigation of the potential influences of population level factors, along with the potential influence of the individual differences of fear of failure and perceived self-efficacy (Choi and Shepherd, 2004; McMullen and Shepherd, 2006; Klein, 2008).

Our use of the decision as the unit of analysis is consistent with some of the early entrepreneurial cognition research (Shaver and Scott, 1991) and the more recent work on entrepreneurial investments by venture capitalist (Zacharakis and Myer, 1997), as well as the formation of opportunity beliefs in the minds of entrepreneurs (Shepherd et al., 2007). Similarly, Shaver and Scott (1991, p. 27) asserted that, "a comprehensive psychological portrait of new venture creation will ultimately have to show how the individual's cognitive representation of the world gets translated into action." One mechanism by which cognitive representations get translated into action is through opportunity related investments in time and money (Dean and McMullen, 2002; Choi and Shepherd, 2004; Klein, 2008). Consistent with this logic and the previous cognitive based entrepreneurship

literature, we operationalize entrepreneurial action as the decision to invest in the creation of a new venture. It may be useful to note that the adoption of this approach in the existing literature, and in our research, means that it is the decision that results from the entrepreneur's cognitions that is being measured and not the cognitions themselves. This is a subtle, but important, distinction in our research.

We recognize that many factors may influence an individual's decision to engage in entrepreneurial action. However, as previously discussed, we have decided to focus on the ecological factors of founding rates, dissolution rates, and population densities. We have also chosen to consider the potential influence the individual entrepreneur's level of fear of failure and general self-efficacy. The decision to include these variables, and not others, in our theoretical model was based on the existing ecology and entrepreneurship literatures explicit and implicit identification that each of these variables is likely to influence the entrepreneurial decision making process. More specifically, we selected the individual differences variables of fear of failure and general self efficacy because the entrepreneurship literature has documented a general bias against failure and for success (McGrath, 1999; Baron and Ensley, 2006; Mitchell, Mitchell, and Smith, 2008) and because a large body of multidisciplinary research has highlighted the influential role of self-efficacy in everything from motivation (Locke et al., 1988) to coping with stressful conditions (Luszczynska et al., 2005). Because entrepreneurial action is success oriented and motivation based, it appeared that fear of failure and general self-efficacy are two individual differences that are likely to play an important role in the decision to invest in an entrepreneurial opportunity and thus were chosen for inclusion in our research.

## **2.5 Opportunity Related Uncertainty, Desirability, and Feasibility**

Because entrepreneurial action is dependent upon the individual's perceptions, the degree of uncertainty associated with a given opportunity becomes an important consideration. Uncertainty has been discussed by Knight (1921) who argues that the condition of uncertainty exists when the possible outcomes are not known and the probability of the outcomes is also ambiguous. In a similar vein, Galbraith (1977: p. 37) defined uncertainty as "the difference between the amount of information required to perform the task and the amount of information already possessed." In short, high levels of uncertainty can be thought of as knowing the right questions to ask, but lacking the answers to those questions (Alvarez and Barney, 2005; Eckhardt and Ciuchta, 2008). The creation of new ventures under conditions of high uncertainty is a gamble and the firm's organizers often do not know or understand the possible future outcomes of their activities (Shackle, 1979).

Early entrepreneurship theorists, such as Knight (1921) and Schumpeter (1934) recognized that uncertainty creates a barrier to entrepreneurial behavior. However, these theorists saw the problem as the individual's lack of willingness to bear uncertainty, as opposed to entrepreneurship as the outcome of less perceived uncertainty. Modern perspectives on the role of uncertainty in entrepreneurship move away from the willingness to bear uncertainty and focus on the fact that uncertainty has been shown to lead to hesitancy and indecisiveness (March, 1981). Thus, there is thought to be a negative relationship between uncertainty and entrepreneurial action. McMullen and Shepherd (2006) argue that uncertainty constrains entrepreneurship by clouding an individual's judgment regarding the need for action, the knowledge of what to do, and understanding the true cost-benefit relationship associated with entrepreneurial action.

Because uncertainty has been conceptualized as a quantity, it is thought that a person experiences either more or less uncertainty. As perceived uncertainty levels rise, doubts about the existence of an entrepreneurial opportunity begin to affect the entrepreneur's willingness to act. In this way, activities that serve to reduce the level of perceived uncertainty (e.g., information search, environmental scanning, ect.) are thought to increase the odds of entrepreneurial activity (Stewart, May, and Kalia, 2008).

Related to the concept of uncertainty is the perceived desirability and feasibility of an entrepreneurial opportunity. The desirability aspect is dependent upon an individual's evaluation of the likely personal impact of engaging in entrepreneurial behavior (Krueger and Brazeal, 1994). Thus, desirability can be conceptualized as a cognitive evaluation of the balance between possible positive versus possible negative outcomes (Shackle, 1979). The feasibility of an opportunity is based on the individual's perception that they have the requisite knowledge and ability to successfully engage in entrepreneurial action (Krueger, 1993). Studies have shown that perceptions of feasibility are heavily influenced by the relationship between the knowledge required to exploit the opportunity and the knowledge already possessed by the entrepreneur (Mitchell, 2006). It has also been shown that the entrepreneur's level of general self efficacy, the perceived personal capability to complete a specific task, is highly related to perceptions of feasibility (Chen, Green, and Crick, 1998). Finally, researchers have argued that because there is a general bias towards success in new venture creation, an individual's fear of failure may also play an important role in perceptions of feasibility (McGrath, 1999).

Collectively, opportunity related perceptions of desirability and feasibility are important correlates of entrepreneurial action. Logic suggests that if the entrepreneur perceives the opportunity to be desirable and feasible they will be more likely to invest time and resources in the evaluation and exploitation of the opportunity. However, these perceptions are likely to be influenced by individual differences. For example, an individual who enjoys a relatively high level of general self-efficacy may be much more likely to view an opportunity as desirable and feasible, than someone with a more tempered view of their own abilities. As such, it is important to consider the influence of individual differences in cognitive models of opportunity evaluation.

## **CHAPTER 3**

### **THEORY DEVELOPMENT**

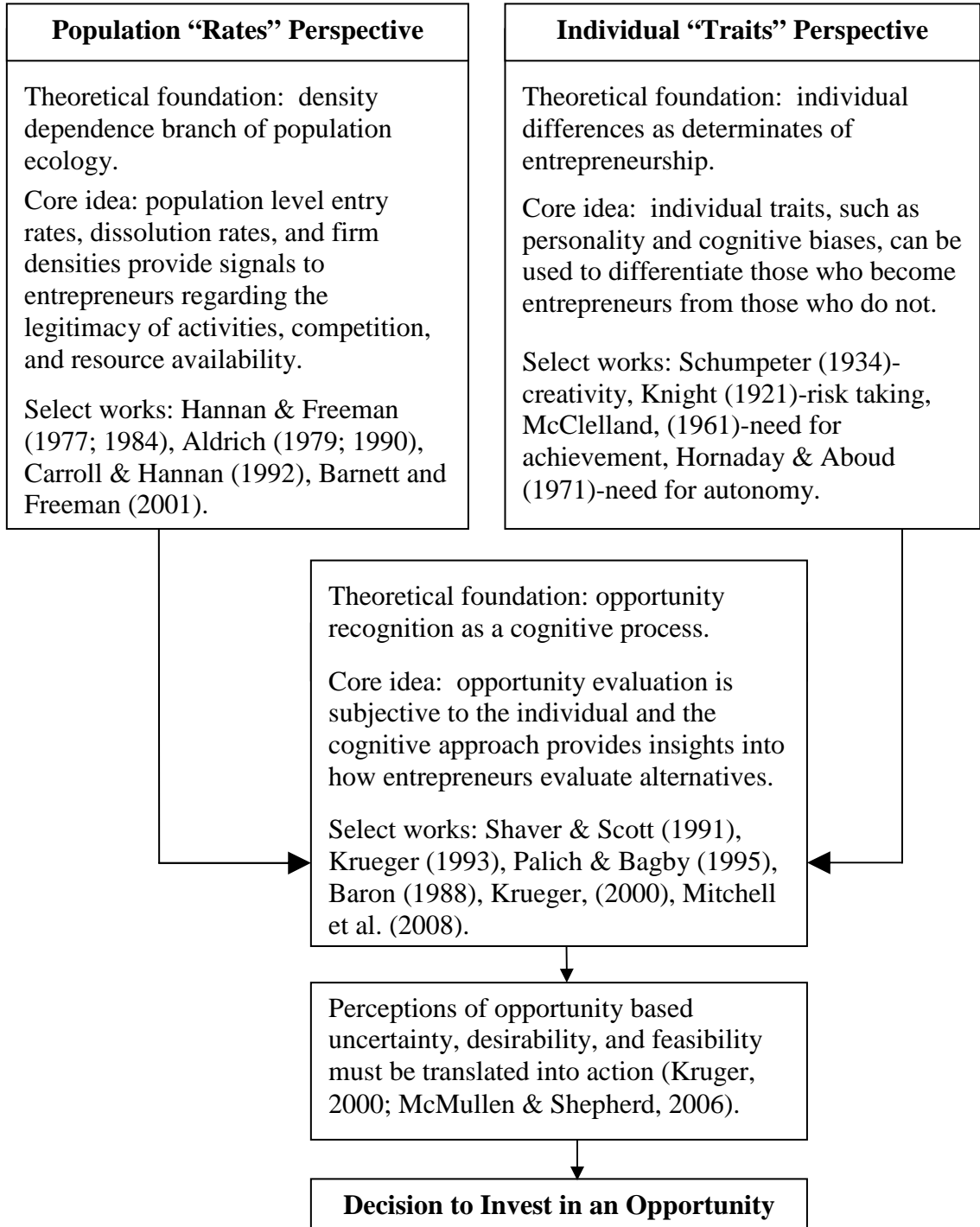
#### **3.1 General Approach, Unit of Analysis, and Assumptions**

The central premise for the theory developed in this thesis is an integration of two complimentary, but often isolated, perspectives on new venture creation. The first perspective is the entrepreneurial approach, which focuses on the characteristics and cognitions of individual entrepreneurs (McClelland, 1961; Baron, 1998). The second perspective is the ecological approach and examines the macro-level conditions which lead to the creation of new forms of organizations (Hannan and Freeman, 1977). The ecological approach emphasizes that it is the distribution of resources in society, not the motives, decisions, or behavior of individuals, that is a key factor in the new venture creation process (Van de Ven, Hudson, and Schroeder, 1984). However, it appears that the ecologists implicitly assume certain cognitions and behaviors when exploring population level phenomena (see for example Delacroix and Carroll, 1983: p. 279). As such, an integrative focus is needed because of the implicit relationship between population level factors and entrepreneurship (Young, 1971). More specifically, this approach opens up the black box of assumptions regarding the influence of population level conditions on entrepreneurial activity, that have been made by some ecology researchers (Aldrich and Wiedenmayer, 1993; Carroll and Khessina, 2005; Eckhardt and Ciuchra, 2008). Many of these scholars implicitly, and in some cases more explicitly, assume that population level dynamics provide signals to entrepreneurs regarding resource availability and new venture viability. However, these same researchers fail to examine the opportunity signal notion using data from entrepreneurs. Thus, consistent



with the stated objectives of this thesis, we begin the process of exploring the relationship between population rates and individual entrepreneurial action (See Figure 1).

**Figure 1: Overview of Rates and Traits Integration**



### ***3.1.1 Unit of Analysis***

One of the difficulties of integrating the population rates perspective with the actions of entrepreneurs is the fundamental difference in the unit of analysis. Ecology based models use the institution and community as the unit of analysis when examining the origins of totally new populations (Aldrich and Mueller, 1982). Thus, when looking at changes in founding rates, dissolution rates, and density levels the unit of analysis becomes the population. Population level analyses become somewhat problematic, as critics are quick to point out, because it is difficult to define and quantify what is meant by the term population (Young, 1988). Generally speaking, most ecology studies conceptualize and operationalize the construct of population as an industry (e.g. Budros, 1994; Barnett and Freeman, 2001; Dowell and Swaminathan, 2006) and admittedly this approach has clearly identifiable limitations. In our study we are not formally measuring the population, as an ecology study would, so there is little need to formally operationalize the population. But to be conceptually clear we follow the ecology tradition and conceptualize the population as an industry.

In contrast to the ecology perspective, models of entrepreneurship generally adopt the firm, the individual, or the decision as the unit of analysis (e.g., Shaver and Scott, 1991; Busenitz and Barney, 1997; Shepherd and Zacharakis, 1997b; Choi and Shepherd, 2004). In this research tradition, the focus is on why some individuals recognize opportunities while others do not. In a similar vein, our study seeks to understand how population level conditions influence the entrepreneur's decision to invest in an entrepreneurial opportunity. Hence, the unit of analysis adopted in our study will be the decision of the individual entrepreneur.

The adoption of the decision as the unit of analysis is consistent with some of the prominent entrepreneurship scholars thinking on how we should explore opportunity focused issues. For example, Shane (2003) has argued that more research is needed on the decision to exploit opportunities rather than the static state of being an entrepreneur. He stated that “research on the actual decision to exploit opportunities among people at risk of such exploitation would overcome many of the limitations inherent in much of the existing research on this topic, as well as provide more precise explanations for how individual differences influence the entrepreneurial process” (Shane, 2003: p. 264). In addition, our choice to use the decision as the unit of analysis follows a line of empirical research that explored the actions of entrepreneurs or investors under a specific set of environmental conditions. For example, Muzyka et al. (1996) explored the criterion European venture capitalists used in their decisions to invest in the launch of a new venture. Zacharakis and Myer (1997) also used the decision as the unit of analysis in an experiment that evaluated venture capitalists willingness to invest in a new venture given a specific set of contextual conditions. More recently, Choi and Shepherd (2004) used the decision as the unit of analysis in an experimental study that investigated how different levels of perceived knowledge, enabling technologies, and stakeholder support influenced entrepreneurs’ willingness to engage in opportunity exploitation. In each of the studies highlighted above, the central idea is that if the context varies, the individual’s decisions will vary, even if the individual remains constant across the series of decisions. Thus, in our study it is this series of decisions we are interested in, given specific levels of population level conditions, as well as differential levels of fear of failure and general self-efficacy.

### ***3.1.2 Assumptions***

Changing environmental conditions challenge active and nascent entrepreneurs to adapt their view of what is (and what is not) a conducive environment for opportunity related investments. Adaptation to current environmental conditions begins with environmental scanning. Environmental scanning is most commonly associated with the activities of decision makers in existing organizations and is defined as the search mechanism by which leaders identify important events and trends outside their organizations (Hambrick, 1982). As such, the environmental scanning within existing organizations is heavily covered within the strategic management literature (Cho, 2006; Vinay, Walters, and Priem, 2003; Sawyerr, 1993). However, environmental scanning is considered to be an important factor in the creation of new businesses. Stewart, May, and Kalia (2008: 99), for example, argue that, “in pre-venture founding activities, not only may scanning be more intensive to evaluate the perceived entrepreneurial opportunity, but the focus of this surveillance may also differ.” Thus, environmental scanning is thought to be an extensive information search process that nascent entrepreneurs may engage in during the opportunity recognition and evaluation stages (Shane, 2003).

This research does not specifically address the scanning issue. Rather, it assumes that entrepreneurs do engage in scanning activities. Moreover, it assumes, based on the ecology literature that entrepreneurs do indeed scan for population level indicators and that these indicators provide signals that entrepreneurs use in making judgments regarding the decision to engage in entrepreneurial action. We acknowledge that the assumption that entrepreneurs do, in-fact, scan for population level indicators before starting a new venture may be somewhat controversial as there is little empirical evidence on the scanning / population level indicators relationship. However, this assumption is

repeatedly implied within the ecology literature (e.g., Delacroix and Carroll, 1983; Aldrich, 1990).

In addition, the entrepreneurship literature does not directly address population level indicators as signals of opportunities, hence the need for our study, but researchers have shown that environmental scanning and public information play an important role in the entrepreneurial process. For example, Jackson and Dutton (1988) show that entrepreneurial managers often scan the environment looking for threats and opportunities. They go on to discuss how these individuals were more likely to recognize threats than opportunities, which supports the idea that business leaders are continually scanning the environment for signals of threats and opportunities. Similarly, Hills and Shrader (1998) explored the role of information searches in entrepreneurial success and found that the members of the Chicago Area Entrepreneurship Hall of Fame (the more successful group) were much more likely to engage in extensive information searches than a less successful group of entrepreneurs. Hence, there is some support for the notion that environmental scanning plays an important role in existing and start-up firms. Moreover, the literature on business plan development, which is a common requirement for new venture funding, suggests that entrepreneurs should investigate the number of firms in an industry, along with the historical and current founding rates and dissolution rates (see for example Harper, 2006; Barringer and Ireland, 2008). Thus, based on the literatures discussed above, we feel it is theoretically valid to predicate this research on the assumption that entrepreneurs do scan for opportunity related indicators, and that population rates and density levels are likely to be an indicator used by entrepreneurs in the new venture creation process.

### **3.2 Founding Rates and Entrepreneurial Opportunities**

The first population level indicator thought to influence the decision to invest in a new venture is the founding rates of new organizations. Founding rates are the culmination, or the number, of organizational foundings within a specific population. An organizational founding is defined as, “the creation of an operating entity that acquires inputs from suppliers and provides output to a given public” (Delacroix and Carroll, 1983: p. 276). To an ecology theorist, founding rates of populations are important because they directly relate to the process of competition, which is often used to explain why changes in populations occur (e.g., Hannan and Freeman, 1987). Ecologists argue that it is the presence of competition that determines the rate of new venture foundings. The idea is that increased competition leads to resource scarcity, which makes it difficult for existing firms to thrive and even more difficult for new firms to survive. Thus, ecology based theories assume that rational actors would shy away from engaging in venture creation when the competition for resources is intense (Hannan and Carroll, 1992). However, the assumption that entrepreneurs would chose to stay out of the industry when founding rates are high rests on several key principles: (1) entrepreneurs are rational and (2) that entrepreneurs make themselves aware of founding rates and (3) that entrepreneurs will interpret high levels of foundings as a signal of resource scarcity. Alternatively, some ecologist argue that increase founding rates provide legitimacy benefits to the population (Hannan and Freeman, 1987). Thus, it is entirely plausible that entrepreneurs may consider high founding rates as a signal of opportunity and not as a signal of resource scarcity. Therefore, understanding the relationship between founding rates and entrepreneurs decisions to invest in opportunities would provide insights into the mechanisms driving the ecological argument that the number of current and previous

new firm foundings has a significant effect on future foundings. In this way, theories of entrepreneurship become valuable as they directly speak to the new venture investment decision (Shane and Venkataraman, 2000).

As previously discussed, an entrepreneurial opportunity is the discovery of new means-ends relationships in which new goods, services, raw materials, and organizing methods are introduced to the market (Shane and Venkataraman, 2000). Because there must be differential levels of beliefs regarding the profit potential for new means-ends relationships, all opportunities cannot be obvious to everyone all of the time (Hayek, 1945). One way differential beliefs occur is by way of information asymmetry. Opportunity information is not widely distributed throughout a population because most individuals operate in specialized knowledge areas (Hayek, 1945, Baron and Ensley, 2006; Janney and Dess, 2006). Even when opportunity related information is evenly distributed, individuals have different degrees of related knowledge and cognitive differences that determine how the new information affects an individual's view of the opportunity. Thus, at any point in time the same information regarding population level environmental conditions may seem like an opportunity to some, but not to others. In this way, a perception of whether or not an opportunity for entrepreneurial action exists is a cognitive phenomenon.

Entrepreneurial cognitions become important because opportunity evaluation is subjective to the individual and this approach provides insights into how entrepreneurs evaluate alternatives (Krueger, 1993). The cognitive perspective argues that the same information may be analyzed and used in very different ways. Individuals differ in the way they perceive risk, opportunity, uncertainty, desirability, and feasibility. However, it

is a general premise of theories of entrepreneurship that opportunities with lower levels of perceived uncertainty, and higher levels of desirability and feasibility are more likely to be exploited by entrepreneurs (e.g., McMullen and Shepherd, 2006; Alvarez and Barney, 2005). In order for perceptions of uncertainty, desirability, and feasibility to change there must be an assimilation of new information by the entrepreneur. This is particularly true when it comes to the nature of the general environment (Mitchell, 2006). As such, we argue, based on the ecology literature that information regarding the rates of new firm foundings is important and may be used by entrepreneurs in their formation of opportunity beliefs (Shepherd et al., 2007).

The ecology perspective implies that the rate of new firm foundings may have a significant effect on the willingness of entrepreneurs to enter the population. Founding rates may provide a perceptual signal about the opportunity structure and the current drain on important resources. Depending on the direction of opportunity signal, entrepreneurs and existing firms may be encouraged or discouraged from entering the population. High rates of prior foundings may be interpreted as a signal of opportunity availability, and potential entrepreneurs may be encouraged to mimic the actions of other entrepreneurs resulting in a strong positive relationship between current and subsequent founding rates. Alternatively, high levels of prior foundings may lead to the perceptual conclusion that the resource space is overcrowded and the newcomer would have a great deal of difficulty securing the necessary resources to ensure survival. In this case, the entrepreneur would be more likely to look elsewhere for new venture creation opportunities.



Based on the extant literature and logic discussed above we acknowledge that one could argue that high founding rates provide a signal of opportunity or a signal of resource scarcity. Each of these arguments would then result in alternate conclusion regarding how high founding rates enhance or constrain entrepreneurial action. For example, the ecology scholars Hannan and Carroll (1992) assumed that high founding rates would lead entrepreneurs to believe that the resource space was overcrowded and thus entrepreneurial activity would be discouraged. However, as we begin to integrate the behavior of the entrepreneur into the population rates perspective, we assert that entrepreneurs are more likely to see an increase in firm foundings as a signal of opportunity, rather than as a signal of resource scarcity. The justification for our position is based on the entrepreneurship literatures suggestion that when entrepreneurs perceive lower levels of uncertainty they are more likely to engage in entrepreneurial action (Kirzner, 1979; Krueger; 2000; McMullen and Shepherd, 2006). One significant source of uncertainty for entrepreneurs is demand uncertainty, which is the degree of value customers will place on new product or service being offered to the market (Choi & Shepherd, 2004). Because entrepreneurial opportunities are, by definition, based on the introduction of new goods or services, the amount of demand uncertainty is often quite high (Shane and Venkataraman, 2000). Thus, as the number of new firm foundings increases the amount of demand uncertainty is likely to decrease for the entrepreneur considering the formation of a new firm within that industry. This decrease in demand uncertainty is important because the entrepreneurship literature also informs that as uncertainty decreases perceptions of desirability and feasibility are likely to increase (Krueger, 1993). Therefore, we would generally expect to see a positive relationship

between an increase in founding rates and the entrepreneur's decision to invest in the creation of a new business venture, as reflected by the first hypothesis:

*H1: Within a given population, there will be a significant main effect of founding rates on entrepreneurs' decisions to invest in new venture creation, such that entrepreneurs will be more likely to decide to invest in an opportunity when founding rates are high rather than low.*

### **3.3 Dissolution Rates and Entrepreneurial Opportunities**

The second ecology based population level factor that may be related to entrepreneurial action is the dissolution, or exit, rates of existing firms. The ecology perspective asserts that there is a direct relationship between current dissolution rates and the creation of new ventures within a given population. Aldrich and Wiedenmayer (1993) argue that dissolution rates constrain the creation of new firms in two ways: (1) existing firms tie up valuable resources that can only become available for new firm creation if existing firms dissolve, and (2) high exit rates may serve as a signal to entrepreneurs that the population has exceeded capacity, thereby turning away potential founders. According to ecologists, the potential effects of dissolution rates on entrepreneurial action are potentially contradictory. On one hand, high exit rates free up valuable resources, but they may also provide a signal of uncertainty leading to the perceptions that new venture creation is not feasible within a given population.

One of the empirical studies to investigate the impact of prior dissolution rates on new firm foundings was Delacroix and Carroll's (1983) study of newspapers. They found that a relatively small number of dissolutions in a year (8 or less) had a positive influence on the subsequent launching of new newspapers. They conjectured that this was because dissolutions freed up valuable resources that were reassembled by entrepreneurs. However, they also found that as the number of dissolution increased

(greater than 8 per year) “the resources freed by the demise of newspapers failed to be reutilized” (Delacroix and Carroll, 1983: 287). These findings lead the researchers to conjecture that large numbers of dissolutions lead to a negative interpretation of the business climate within the population and this negativity overwhelmed any positive effects of increased resource availability. In a similar study, Barnett and Amburgey (1990) examined a number of telephone companies and found that as dissolution rates increased the number of new firm foundings decreased. Their subsequent assessment of this finding implied that as the number of dissolution increased potential new entrants became discouraged. Collectively, these studies seem to indicate that even though dissolutions free-up key resources, these resources are likely to be ignored by entrepreneurs because the negative perception of the availability of opportunities within the population (Aldrich and Wiedenmayer, 1993).

From the entrepreneurial cognition perspective, we must consider how the entrepreneur’s perceptions of opportunity related uncertainty, desirability, and feasibility are likely to be influenced given the population level dissolution rate information. Here again, we adopt the perspective that increased levels of uncertainty will lead to negative perceptions of opportunities, thereby constraining entrepreneurial action (McMullen and Shepherd, 2006). It seems logical to conclude that as entrepreneurs receive information that existing firms are leaving the industry at a high rate, they would perceive the success of a new venture in that industry to be very uncertain, and in some cases not at all feasible. Despite the fact that entrepreneurs may be able to readily acquire resources, perhaps at substantially discounted prices, the resource advantage will be overwhelmed by perceptions of increased levels of uncertainty. In this way, entrepreneurs will

consider high dissolution rates to be a signal to avoid entrepreneurial action. Thus, there will be a negative relationship between dissolution rates and entrepreneurial action (investment) as highlighted by the following hypothesis:

*H2: Within a given population, there will be a significant main effect of dissolution rates on entrepreneurs' decisions to invest in new venture creation, such that entrepreneurs will be more likely to decide to invest in an opportunity when dissolution rates are low rather than high.*

### **3.4 Population Density and Entrepreneurial Opportunities**

The final ecology based population factor that is thought to be highly related to entrepreneurial action is the density, or number of firms, within a given population. Population density is thought to directly influence entrepreneurial activity by way of legitimation and competition (Hannan, 1986). In the early stages of population development, a lack of firm density may be a signal that the activities or outputs of the new population are not legitimate. As population density increases, the odds increase that firms within this population will be seen as legitimate. In this way, an increase in population density, during the early stages of the population lifecycle, is thought to enhance entrepreneurial action. The ecological argument is that as new firms enter the population, entrepreneurs will begin to see the value and utility of the activities within the population. As legitimacy increases, entrepreneurs begin to see that the creation of new venture within this domain as feasible. In addition, the relatively low density levels present during the legitimation stage imply that resources are abundant and not a key concern for potential founders. The combination of increasing levels of legitimacy and the availability of resources is argued to lead to increases in new venture creation.

Working against the positive influence of the legitimation process is the negative influence of the competition process (Aldrich and Wiedenmayer, 1993). As the lifecycle

of the industry progresses, the legitimation processes attracts entrepreneurial activity, thereby increasing population density. But, as population density increases, there becomes more competition for valuable resources and market share. As the number of firms within the population increases the negative effects of increased levels of competition begins to overwhelm the positive effects of increased legitimacy. Once the focus has shifted to competition, potential founders become increasingly uncertain about the availability of opportunities and more concerned that it will be increasingly difficult to secure the key resources need to compete within the population domain. Thus, increased uncertainty and resource constraints become the key issue and entrepreneurs becomes far less concerned about perceptions of legitimacy. In this way, high levels of population density are likely to be a signal that competition for resources and market share is quite intense, which results in a scarcity of entrepreneurial opportunities within the population. Thus, the ecology argument is that high levels of population density will lead to lower levels of new venture creation.

The application of the individual level entrepreneurial cognition and action-based framework to the population density argument discussed above presents some rather unique challenges. The difficulty for the individual entrepreneur is how does one recognize when the shift from legitimation to competition is happening? Moreover, how does one know when the population has reached its carrying capacity? Is the carrying capacity fixed, or can it be expended through efforts such as marketing and lobbying? If the carrying capacity is relatively fixed, then is it possible for the entrepreneur to recognize when additional increases in density will most likely result in additional increases in dissolution? It appears that the simple answer is that is not possible to

recognize these turning points a-priori (Young, 1988). As such, the cognitive perceptions of the entrepreneur become especially critical when interpreting population density in the opportunity evaluation process.

From a cognitive standpoint, the critical issue is the opportunity related signal that differential levels of population density send to entrepreneurs. More specifically, different levels of population density are likely to impact the perceived level of uncertainty, desirability, and feasibility associated with an opportunity. In the early stages of the population lifecycle firm density is low. When firm density is low, entrepreneurs are likely to perceive that there is an unfulfilled market need and the opportunity space is abundant. Because the resources needed to act on the opportunity in a low density environment may be more plentiful, the entrepreneur is also likely to associate high levels of desirability with this opportunity. However, uncertainty may be high, because there are few existing organizations that can be used as guides for exploitation activities. Additionally, the legitimacy of the new venture may also be in question. Alternatively, high levels of population density may serve to reduce the uncertainty related to the value of the output provided, but increase the perceptions that a new venture may not be desirable or feasible because the current competitive landscape is placing heavy resource constraints on new entrants.

Because opportunity related uncertainty and the availability of key resources are important drivers of success, entrepreneurs often seek to be first movers by entering the population at an early stage of the life cycle (Peteraf, 1993). Research has shown that those who are the first to enter the market have a better chance of gaining large shares of the market (Robinson, 1988), are more likely to experience long-term profitability

(Lambkin, 1988), and face better odds of survival (Robinson and Min, 2002). Because one of the central focuses of entrepreneurship is innovative behavior (Gartner, 1985), it is often implied that entrepreneurs are in search of pioneering opportunities, as opposed to conservatively following others. However, entering the population when density is low may be more risky than entering after legitimacy has been established and successful models can be used as guides for new venture creation. Thus, it is possible that entrepreneurs will perceive moderate levels of population density to be just the right balance of perceived uncertainty, legitimacy, and resource availability. Based on this logic, we posit that entrepreneurs will view an opportunity more positively, and be more likely to engage in entrepreneurial action, when population density is moderate rather than low or high, as posited in the following hypothesis:

*H3: Within a given population, there will be a significant main effect of density levels on entrepreneurs' decisions to invest in new venture creation, such that entrepreneurs will be more likely to decide to invest in an opportunity when density levels are moderate rather than low or high.*

### **3.5 Influence of Individual Differences**

One of the central concerns in the decision to engage in entrepreneurial action is the degree of perceived uncertainty, feasibility, and desirability associated with the opportunity (Krueger, 2000). McMullen and Shepherd (2006), along with several other entrepreneurship researchers, have argued that high levels of perceived uncertainty can restrict entrepreneurial activity. Thus, it is assumed that entrepreneurs will engage in information seeking activities that will reduce the uncertainty associated with the opportunity and increase the odds of entrepreneurial action. However, given the same information, individual level differences may impact the degree of perceived uncertainty

experienced by each individual entrepreneur leading to different perceptions of the desirability and feasibility of the opportunity.

The influence of individual differences on entrepreneurial action falls within the trait based research tradition. As previously discussed, a large body of entrepreneurship research suggests that a key differentiator between those who engage in entrepreneurship and those who do not is a host of individual differences or traits. The entrepreneur's preferences for risk-taking (Brockhaus, 1980) and need for achievement (McClelland, 1961) are two examples that have received considerable attention in the literature. However, the inconsistent findings associated with these traits have lead some researchers to conclude that individual difference variables may serve as moderators, rather than predictors, in explanatory models of entrepreneurial behavior (e.g., Brockman and Morgan, 2006; Mitchell, 2006). While there are many individual difference variables that may influence the effect of population level factors on perceptions of opportunities, we have selected two salient individual differences for consideration in the theoretical model: fear of failure and general self efficacy. While these two factors are not the only individual differences that may impact the evaluation of an entrepreneurial opportunity, prior research has indicated that they are certainly noteworthy (McClelland, 1987; Speier and Frese, 1997; Baum and Locke, 2004; Elliot & Thrash, 2004; McGregor and Elliot, 2005).

The choice to include fear of failure is based on studies in the entrepreneurship literature that have documented the general bias against failure and for success (McGrath, 1999; Baron and Ensley, 2006; Mitchell, Mitchell, and Smith, 2008). For more than 60 years, social psychologist and motivational theorists have studied the nature and



consequences of dispositional fear of failure (Atkinson, 1957; Birney, Burdick, & Teevan, 1969, Elliot & McGregor, 1999). Fear of failure has been portrayed by Atkinson (1957: p. 360) as “the capacity or propensity to experience shame upon failure.” Empirical work on this avoidance-oriented achievement motive has demonstrated that it leads to a host of generally negative processes and outcomes (for reviews, see McClelland, 1987; Elliot & Thrash, 2004). McGregor and Elliot (2005) comment on the psychology based literature by stating, “Overall, the extant data indicates that individuals high in fear of failure are socialized in a way that orients them to the possibility of failure, that exerts pressure on them to succeed beyond their capacity, and that exacts relational costs should failure occur. These individuals appear to have learned to define failure as an unacceptable event that carries negative implications for their self-worth and relational security.” (p. 219).

In research more germane to discussion of entrepreneurship, McGrath (1999) builds upon the psychology literature to assert that fear of failure can be thought of as a general bias towards downside risk and away from upside benefits. As such, it is generally assumed individuals who are high in fear of failure have been socialized to avoid the potential for the negative feedback that may result from the challenge of an achievement situation (McGregor and Elliot, 2005). Because entrepreneurship is clearly an achievement situation, logic suggests that individuals who are high in fear of failure would be less likely to engage in entrepreneurship than individuals who are less likely to engage in this avoidance-based self regulation. Thus, holding all else constant, potential entrepreneurs who are biased against failure (high fear of failure) may be less likely to

invest in an entrepreneurial opportunity than those who are not, as posited by the fourth hypothesis:

*H4: There will be a significant main effect for fear of failure on the investment decision, such that entrepreneurs who are less afraid of failure will be more likely to invest in an opportunity.*

Another individual difference that is likely to influence the propensity to engage in entrepreneurial activity is the individual's level of perceived self efficacy (Speier and Frese, 1997; Baum and Locke, 2004; Mitchell, 2006). The decision to include perceived self efficacy in the theoretical model is based on the large body of multidisciplinary research that highlights the influential role of self-efficacy in everything from motivation (Locke et al., 1988) to coping with stressful conditions (Luszczynska et al., 2005). The concept of self-efficacy is based on social learning theory (Bandura, 1977) and is defined as an individual's perceived ability to execute a target behavior (Bandura, 1977; Krueger, 2000). Bandura (1997) has characterized self-efficacy as competence based, forward looking, and action oriented. As such, it is generally argued that self-efficacy plays an important role in influencing goal driven behavior (Luszczynska et al., 2005). Because entrepreneurship is inherently a goal driven activity, the entrepreneur's level of perceived self-efficacy is likely to influence the entrepreneurs decision to engage in new venture creation.

Self- efficacy is often discussed in terms of task or domain specificity. However, several researchers have conceptualized self-efficacy as a broad and stable sense of personal competence to deal effectively with situations that require peak effort in goal attainment activities (Sherer et al., 1982; Krueger, 2000; Luszczynska et al., 2005). As such, the concept of general self-efficacy has been introduced to reflect a generalization of

an individual's sense of competence across a wide variety of domains. General self-efficacy has proven useful in the explanation of human behavior and outcomes when the behavioral context is less defined and multiple influences are exerting pressures on the individual actor (Luszczynska et al., 2004). Within the context of entrepreneurship, a focus on general self-efficacy is appropriate because entrepreneurs must have confidence in their capabilities in a wide, and often uncertain, range of situations (Baum and Locke, 2004). As such, the theoretical model developed in this thesis considers the impact of general self-efficacy only and does not consider the influence of task specific self-efficacy related factors.

Previous research has found that individuals with high general self-efficacy are likely to seek challenging situations and opportunities (Bandura, 1997). They are also more likely to prevail in difficult circumstances and show a higher degree of personal initiative (Speier and Frese, 1997). Because higher levels of general self-efficacy have been linked to the behaviors outlined above, general self-efficacy has been shown to be related to new venture creation and long term business success (Ashford and Tsui, 1991; Poon, et al., 2006). As such, entrepreneurship researchers often link general self-efficacy to entrepreneurial intentions and actions (e.g., Boyd and Vozikis, 1994). Previous research indicates that higher levels of self-efficacy are positively related to intentions to start a new business, higher rates of innovation, and a greater propensity for risk taking (Chen, Green and Crick, 1998; Krueger and Dickson, 1994). Based on the existing research, it is anticipated that the level of general self efficacy is very likely to impact the decision to invest in new venture creation. More specifically, it is likely that individuals with high levels of general self-efficacy will be more likely to invest in new venture creation than

those with low levels of self-efficacy. Simply put, entrepreneurs with high general self-efficacy may be more likely to invest because they are confident that they can accomplish the goal. The effect of general self-efficacy on the investment decision is captured in the final hypothesis:

*H5: There will be a significant main effect for general self-efficacy on the investment decision, such that entrepreneurs who have greater self-efficacy will be more likely to invest in an opportunity.*

## CHAPTER FOUR

### RESEARCH METHODS AND DATA COLLECTION

#### 4.1 Research design

As previously discussed, this thesis is focused on understanding the influence of population level conditions and the individual differences of fear of failure and general self-efficacy on entrepreneurs' decision to invest in an entrepreneurial opportunity. As such, we sought a research design that would allow us to operationalize and measure entrepreneurs' decisions under differential levels of population rates and densities. Shepherd and Zacharakis (1997) have pointed out that much of the research within the field of entrepreneurship has traditionally relied on post-hoc methodologies such as surveys and interviews, and these techniques do not lend themselves well to decision making models. A quick scan of the current entrepreneurship literature indicates that there has been some increase in non-survey based research (e.g., Choi and Shepherd, 2004; Mitchell et al, 2008), but Mitchell et al. (2007) argue that much of the entrepreneurship research still relies on post-hoc methodologies (see Barbosa et al., 2007 as recent example). While the survey and interview approaches have provided valuable insights into many phenomena of interest, it is also associated with some major limitations. Golden (1992) has argued that retrospective data often captures heavy biases due to the respondents level of motivation, cognitive limitations (March and Simon, 1958), and lack of information regarding the events in question (Phillips, 1981). In response, some have suggested that conjoint analysis and other similar methods may be more appropriate techniques for the exploration of decision making processes (Riquelme and Rickards, 1992; Shepherd and Zacharakis, 1997b; Aiman-Smith et al., 2002). This recommendation stems from the idea that conjoint analysis allows investigators to better

understand the way people see and predict the environment while making outcome based judgments, such as the launch of a new business venture (Beemer and Beemer, 1988).

Therefore, we have selected conjoint analysis as the research methodology for our study.

Conjoint analysis is an experimental technique that requires respondents to make a series of judgments based on specially developed profiles provided by the researchers. These series of judgments can then be used to analyze the main and interaction effects stimulated by the profiles. These judgments can also be broken down (decomposed) into the significance placed on each individual attribute in the decision context. This unique feature of the conjoint approach can provide important insights into the underlying structure of the decision (Shepherd and Zacharakis, 1997). Because this research is focused on the decision to invest in an entrepreneurial opportunity and understanding the influence of specific population level conditions on those decisions, conjoint analysis was selected to test the hypotheses associated with the theoretical model developed in the previous chapter.

Conjoint analysis has become an important tool for researchers conducting behavioral decision making research and has been used in hundreds of studies focused on judgment and decision making (Green and Srinivasan, 1990; Aiman-Smith et al., 2002). For example, researchers in the field of marketing have used conjoint analysis to test hypotheses associated with models of consumer choice (Carson et al., 1994; Sandor and Wedel, 2001; Arora and Huber, 2001). In this research, conjoint experiments are used to capture which attributes of specific products are the most preferred by participants. Within the domain of entrepreneurship, conjoint experiments have been used to capture the decision making processes of venture capitalists. For example, Muzyka, Bureley, and

Leleux (1996) utilized conjoint analysis in their investigation of several criteria thought to impact the investment decisions made by European venture capitalists. Zacharakis and Myer (1997) relied on conjoint analysis as a way to identify whether the entrepreneur, the market, or competitive factors were the most influential attribute in the decision to invest in a venture capital proposal. Finally, Shepherd (1997) used conjoint analysis to support the idea that investors do utilize contingent decision making process in evaluating the potential profitability of a new venture opportunity. Taken collectively, these studies are reflective of the value of the conjoint approach when the focus of the research is on decision making. Each of these studies captured unique insights that would not be visible using traditional experimental designs or post-hoc techniques.

Conjoint analysis, as with all research methods, has its unique strengths and limitations. The major limitation to the conjoint approach is the threat to external validity. Common criticisms of conjoint studies usually arise from the fact that the conjoint task may not be an accurate representation of reality (Johnson et al., 1989). Critics also point out that it is also possible that respondents will place importance on attributes simply because they were presented in an experiment (Brehmer and Brehmer, 1988). In addition, if the attributes and profiles are not randomized, there is the potential that the researcher is simply capturing order effect. In order to overcome these threats to external validity it has been argued that the use of expert judges and randomized profiles greatly reduces the inherent shortcomings associated with the conjoint approach (Shepherd and Zacharakis, 1997). For example, Schepanski et al. (1992) provided empirical evidence that showed experienced judges are unlikely to favor a specific attribute simply because it has been presented via an experiment. Likewise, Brehmer and

Brehmer (1988) have posited that use of expert judges greatly reduces concerns over external validity, as the research is based on the decision processes of a sample of the population it will be generalized to. Consistent with the suggestions of these authors, our research uses experienced entrepreneurs' (expert judges) as participants in the conjoint experiment and randomized profile orders, with the goal of reducing the impact of the external validity problems often associated with the conjoint approach.

Another potential concern with the use of conjoint analysis is the violation of the independence assumption. The independence assumption refers to the degree that a participant's response is independent from any other response (Hair et al., 2006). Thus, if a respondent is asked to make a series of judgments or decisions each of the previous decisions may influence later decisions, which would violate the independence assumption that most statistical techniques are predicated upon. In a conjoint study each participant is making a series of judgments and those judgments are not independent from one another in the way they would be in a more traditional randomly assigned condition type of experimental design. As a result, it is necessary to acknowledge that the independence assumption has been violated and to make the necessary adjustment. A conjoint study cannot be designed in a way that preserves the integrity of the independence assumption, so there must be an adjustment in the statistical technique used to analyze the data. More specifically, the statistical techniques that are designed for repeated measures analysis specifically adjust for the violation of the independence assumption and do not result in inaccurate F statistics. A repeated measures ANOVA technique is used in this study because it is a repeated measure technique that is not predicated on the assumption of independent responses (Hair et al., 2006; Field, 2000).



In so doing, we feel that we have adequately addressed the concerns associated with the violation of the independence assumption that is inherent in a conjoint design.

Despite the concerns over external validity and the violation of the independence assumption outlined above, conjoint analysis has several unique strengths. First, the conjoint approach is congruent with most experimental research in that internal validity is often high (Aimen-Smith et al., 2002). Because the researcher controls the presentation of the stimuli, it increases the likelihood that the captured effects are the result of the attributes being investigated. Second, the presentation of controlled stimuli also reduces the probability of confounding, which makes it easier to rule out competing explanations for results (McGrath, 1982; Choi and Shepherd, 2004). Finally, the use of conjoint analysis allows the researcher to gain insights into how different individuals see and predict the environment (Brehmer and Brehmer, 1988). Because conjoint analysis is a within-subjects design it lends itself to a unique set of statistical methods that allows the researcher to gain a clearer picture of how respondents view the world based on the information provided (McGrath, 1982). It is these unique strengths that make the conjoint method appropriate for the study of the entrepreneurial decision making investigated in our study.

#### **4.2 Conjoint Profiles & Experiment Presentation**

Conjoint analysis requires the development of a series of profiles that allow experienced entrepreneurs to evaluate the degree to which they would be willing to invest in an opportunity given specific population level conditions. There are several different methods that can be utilized in the development of the experimental profiles (stimuli): traditional, adaptive, or choice-based. In the traditional approach respondents evaluate stimuli constructed from combinations of different levels of each attribute (a.k.a., full

profiles). Because the traditional approach only allows for the use of up to nine attributes, the adaptive approach was developed to allow for the incorporation of a larger number of attributes. Finally, the choice based approach present stimuli in unique sets, but does not allow for interactions. This study adopts the traditional approach because there are only three attributes and the use of full profiles seems reasonable in terms of burden on respondents. Moreover, the use of full profiles provides a richer data set that is likely to provide greater insights into the phenomenon of entrepreneurial opportunity evaluation.

Determination of which attributes, and the level of each attribute, should be driven by the theoretical model being investigated (Hair et al. 2006). The previously developed theoretical model, and its associated hypotheses, asserts that the ecology-based factors of population level founding rates, dissolution rates, and density levels will provide opportunity related signals to entrepreneurs considering new venture creation within the population of interest. As such, the three attributes (independent variables) manipulated are population level founding rates, dissolution rates, and density levels. The determination of the levels of each attribute is driven by the concern that the cues take on reasonable and realistic values (Aiman-Smith et al., 2002). As long as the values are reasonable, researchers often use two or three values (low, high, and/or mean) to represent the levels of each attribute (e.g., Cable and Judge, 1994).

In this study, the ecology literature (Hannan and Carroll, 1992) indicated that extreme levels (high vs. low) would likely be appropriate for the attributes of number of new firm foundings and number of existing firm dissolutions, thus two levels were selected for each of these attributes. However, the attribute of population density is

thought to have an impact on new venture creation when density is low, high, or reaching a median level. As such, a moderate (approximate mean) level of firm density seems to be an appropriate addition to this attribute. In total, three levels of population density have been selected: low, moderate, and high.

It is important to note the perceptual nature of the levels chosen for each attribute. Because individuals may differ in what each considers a high or low level of each attribute, we wish to have each individual conceptualize, for themselves, what the different levels mean to them. In addition, we are asking each participant to conceptualize the opportunity as existing in the industry of their expertise. This means, for example, that high levels of an attribute in one industry may be very different from high levels in another industry. We feel that this approach is consistent with the way people actually make decisions. In addition, this approach is consistent with the extensive body of research that uses conjoint analysis or its brethren policy capturing (Green and Srinivasan, 1990; Cable and Judge, 1994; Shepherd and Zacharakis, 1997; Zacharakis and Myer, 1997; Shepherd, 1997; Aiman-Smith et al., 2002; Choi and Shepherd, 2004; Mitchell, 2006).

Utilizing a full factorial design (2 x 2 x 3) results in 12 full-profile descriptions. Profiles were presented via a web-based interactive process with the order of profile presentation randomized. Participants received one warm-up profile and three repeat profiles, resulting in each participant receiving a total of 16 profiles. The repeat profiles were used to conduct test-retest reliability analyses. More specifically, the three repeat profiles are intended to be analyzed using a paired sample T-test to see if there is a significant difference between the original profile response and the repeat profile

response (Shepherd and Zacharakis, 1997; Aiman-Smith et al., 2002; Hair et al., 2006).

The basic premise is that if the participants have thoughtfully completed the experiment there should be no significant difference between responses.

In addition to the profiles, each participant viewed an instruction screen that detailed the task and provided the relevant assumptions. Participants also viewed a definition screen that provided a general description of the different levels of each attribute. In order to ensure that participants clearly understood the conjoint experiment we specifically asked the participants to indicate whether or not they understood the instruction sheet and the definition sheet. In a further attempt to ensure clarity, the description of each level of each attribute was also included on each of the individual profile screens. Finally, each of the 16 profiles was provided on a separate screen and participants were not allowed to refer back to any of the previous profiles. A sample of the instruction screen, description of terms screen, and sample profile screen are available for review via Appendix A.

One concern that may arise in the design of a conjoint study is the possibility of information overload and respondent fatigue. However, most conjoint experts agree that respondent fatigue is manageable when the number of scenarios is less than 40 (Karren and Barringer, 2002; Aiman-Smith et al., 2002; Shepherd and Zacharakis, 1997). Because our study used only 16 scenarios, we felt that the participants would find the task a reasonable burden and complete all profiles with a maximum amount of attention and consideration. One way to ensure that respondent fatigue is not an influential factor is to evaluate the test vs. retest profiles and the experiment completion rate. The completion rate was 84% and the results of the test – retest profiles are reported in detail in chapter 5.

Without pre-empting our results, the relatively high completion rate and the correspondence between the test and retest profiles lead us to conclude that respondent fatigue was not a significant concern for our study.

#### **4.3 Measures**

*Measure of dependent variable-* The dependent variable is the entrepreneur's decision to invest in an opportunity and is measured using "likelihood of investment" in the opportunity. Conjoint analysis can be conducted using either ranking or rating scales for the dependent variable. In this research a metric rating scale was chosen because it fits conceptually with the way entrepreneurs make decisions and provides increased flexibility in the types of statistical techniques that can be used for data analysis. Thus, likelihood of investment is captured using 5 point Likert scale ranging from highly unlikely to invest (1) to highly likely to invest (5), thus a higher number represents more of the construct (more likely to invest).

*Post-experiment questionnaire* – The questionnaire was designed to measure individual difference characteristics that are thought to influence opportunity evaluation decisions. General self-efficacy and fear of failure were the specific characteristics measured. In addition, the questionnaire also included demographic information and reliability validation questions. More specifically, respondents were asked to provide information regarding their work experience, education, gender, age, and to answer questions that indicated thoughtful completion of the experiment.

General self efficacy was measured using an existing eight item scale - The New General Self-Efficacy Scale (Chen, Gully, and Eden, 2001). Chen and colleagues found this scale to be internally consistent, reliable, and valid; with a Cronbach's alpha of .87 (Chen et al., 2001). In addition, this scale was later utilized by Chen and Klimoski

(2003) and again proved a reliable measure for the general self-efficacy construct. A sample item is “when facing difficult tasks, I am certain I can accomplish them.” The measurement scale was evaluated using a 5 point Likert scale ranging from (1) not at all like me to (5) very much like me. As expected, this scale proved to be a reliable measure in our study with Cronbach’s alpha of .84. The full version of the scale can be reviewed in Appendix B.

Fear of failure was measured using the five-item short form of the Performance Failure Appraisal Inventory (PFAI). The PFAI was originally developed by Conroy, Willow, and Metzler (2002) and is grounded in the cognitive-motivation theory of emotion (Lazarus, 1991). This instrument assesses beliefs that failure is associated with negative consequences. The original scale (long version) is 41 items and represents a practical hurdle for implementation in research. In response, Conroy and colleagues used a rigorous process in the development of a shorter 5 item version of the scale that retains the psychometric qualities of the scores. Conroy et al. (2002) report a Chronbach’s alpha of .88 for the 5 item version of the scale, indicating that there is strong empirical evidence supporting the validity and reliability of the PFAI short form. A sample item is “when I am failing, I am afraid I might not have enough talent.” The measurement scale was evaluated using a 5 point Likert scale ranging from (1) do not believe at all (5) believe 100% of the time. As expected, this scale proved to be a reliable measure in our study with a Cronbach’s alpha of .89. The full version of the scale is provided in Appendix B.

#### **4.4 Model estimation and assessing overall fit:**

In this study, the preference measure used is a metric rating and each individual responded to sixteen different profiles. This approach represents a repeated measures design with three independent variables and one dependent variable. Analysis of a

repeated measures model can be approached from a regression or ANOVA perspective and either would be suitable for this study. Because this study is specifically focused on within group variance, a repeated measures ANOVA technique provides a clearer understanding of the mean differences between each profile and the effect of those differences on the dependent variable. This is possible because the ANOVA analysis generates estimated cell means for each level of the independent variable (Hair et al., 2006). In addition, the repeated measure ANOVA model uses an imbedded logarithm to adjust for the violation of the independence assumption (Field, 2000; Hair et al., 2006). Hence, the ANOVA approach has been selected in order to explore the main and interaction effects associated with varying the levels of entry rates, dissolution rates, and population density. The effects of fear of failure and self-efficacy will also be analyzed by adding these variables as between subject factors to the repeated measures ANOVA model.

The ANOVA approach also allows for the calculation of an Eta-squared value. Eta-squared is a measure of effect size and reflects the amount variance in the dependent variable that explained by each of the independent variables (Hair et al., 2006). This calculation is important because attributes are presented in combination, rather than isolation, and it is helpful to decompose the entrepreneurs' decisions by determining which attribute was the most influential in the decision was making process. While there are no specific hypotheses regarding the weights participants will place on each individual attribute (there is no theoretical justification for a-priori identification), this post-hoc analysis is expected to provide insights into which population level attribute was the most important (Hair et al., 2006) in the decision to invest in an opportunity.

*Statistical Assumptions:* In conjoint analysis the relevant assumption is based on the specification of the composition rule and the model form chosen to estimate the results, both of which should be selected based on relevant theory and practical considerations (Hair et al., 2006). In this case, the ecology theory based constructs of founding rates, dissolution rates, and population density suggest that the use of an additive model is appropriate. Based on the ecological argument that population rates and densities provide signals to entrepreneurs regarding the business environment, it seems reasonable and logical to assume that a potential entrepreneur would take all three factors into account (add the factors) before investing in a new venture, thus the additive model was selected.

In regards to the repeated measures ANOVA, the main concern is the assumption of sphericity. Sphericity refers to the equality of variance between treatment levels and can be thought of as an extension of the homogeneity of variance assumption. Sphericity refers to the equality of variance between treatment levels with the assumption that equality of variance exists (Field, 2000). This assumption is tested via the Mauchly's test, which tests the hypothesis that the variance of the differences between conditions is equal. If this test is significant, statistical adjustments to the degrees of freedom must be made in order to obtain an accurate F statistic.

#### **4.5 Pilot Test**

A pilot test of the conjoint experiment was conducted using five management trained doctoral students and three experienced entrepreneurs. Each of the participants noted that some of the questions were worded in an ambiguous way. For example, one participant noted that one of the fear of failure scale items could be changed to eliminate the term "important others" because it was confusing. In addition, one of the entrepreneurs noted



that a few of the questions should have an alternate response added as a choice, if the question did not apply to them. In general, the pilot test participants felt that the conjoint experiment and post-experiment survey were clear and easily understood and the time required to complete the experiment was a reasonable burden. As such, the various suggestions on wording and format were incorporated into the final version of the experiment, which was then sent to the larger sample.

#### **4.6 Participants**

As previously discussed, the use of expert judges (members of the group you wish to generalize results to) greatly reduces the external validity issues associated with the conjoint approach (Shepherd and Zacharakis, 1997; Aiman-Smith et al., 2002). In this case, expert judges are experienced entrepreneurs. Therefore, we solicited experienced entrepreneurs as participants for our conjoint experiment. There is some debate in the entrepreneurship literature as to who does (and who does not) qualify as an entrepreneur. Some consider any business owner to be an entrepreneur, some argue that only owners of high growth firms are entrepreneurs, and still others assert that only those individuals who have actually started firms can be considered entrepreneurs (see Carland et al., 1988 for a thorough discussion). In our study, we define an experienced entrepreneur to be any individual who has started at least one business at some point in their career. For clarity sake, we do not intend this definition to include those who have launched peripheral extra income or hobby businesses. For example, lawn mowing in high school would not qualify an individual for inclusion in this study. Rather, this study includes those individuals who have launched at least one business that was, is, or is intended to be their primary source of income (see Appendix B, demographic information, question 5).

Recruiting experienced entrepreneurs to participate in any type of research can be very challenging and response rates are often quite low, especially when recruiting from a random sample of entrepreneurs. For example, a recent study by DeTienne and Chandler (2007) used a random sample of experienced entrepreneurs to explore gender differences in opportunity identification and reported a relatively low response rate of approximately 17%. We sought to overcome this challenge by recruiting experienced entrepreneurs by way of social network ties and ties to a regional small business development center. Thus, our sample of entrepreneurs may be considered a convenience sample, rather than a random sample. We felt that use of a convenience sample was justified because of the response rate issue discussed above. Moreover, by using a convenience sample we were better able to ensure that our experiment was completed thoughtfully and by the actual entrepreneur and not by a secretary, intern, or some other form of substitute. Thus, the use of this sample provided us with increased confidence in the internal and external validity of our findings. The major disadvantage to the use of this sample is that our results may not be as generalizable as if we had used a truly random sample of experienced entrepreneurs. Overall, we felt the advantages to using a strong convenience sample outweighed any additional generalizability benefits a random sample may have provided.

Our recruitment efforts consisted of the solicitation of experienced entrepreneurs by way of an e-mail recruitment message. The message was endorsed by the director of a regional small business development center associated with a major Midwestern research university. We sent an initial solicitation for participation e-mail request followed by two reminder e-mails that were sent at one week intervals. In total we sent participation

requests to 118 entrepreneurs. 68 entrepreneurs responded to our requests to participate in the conjoint experiment. However, 11 participants dropped out of the experiment before completion, resulting in a final sample size of 57, which reflects a response rate of 48%. Our rather respectable response rate reflects the value of using a convenience sample with close ties to the university versus a true random sample where the response rate would be expected to be much lower.

One of the major strengths of conjoint analysis is that it is a small sample technique. There is no hard and fast rule for the minimum number of decision makers required for a conjoint study (you could potentially do a conjoint study with only one participant). However, some have suggested that as a general rule a sample size of 50 or greater is normally sufficient (e.g., Shepherd and Zacharakis, 1997). Similar studies in this area reported sample sizes that were consistent with this recommendation. For example, researchers studying the decision making of venture capitalist reported sample sizes of 73 (Muzyka et al., 1996), 53 (Zacharakis and Meyer, 1998), and 66 (Shepherd, 1997). As such, we felt confident in our assessment that our sample size of 57 entrepreneurs was consistent with the existing literature and provided adequate data to begin the investigation of the effects of population level factors on entrepreneurs' decisions to invest in entrepreneurial opportunities.

In terms of participant demographics, we found that of our participants 8 were female and 49 were male. The participants ranged in age from 27 to 84 with a mean of 49. Consistent with our previously discussed definition of an entrepreneur, each participant verified that they had started at least one business that was intended to be their primary source of income. The number of business starts per entrepreneur ranged from 1

to 15 and the average number of business starts per participant was 2.57. In addition, we asked the participants if they would classify themselves as an entrepreneur and each of our 57 participants responded that they would. Finally, we asked each participant to confirm that the person named in the solicitation e-mail did, in fact, complete the conjoint experiment. Each of the 57 participants responded that they did personally complete the experiment. This is an important point because some critics have suggested that many management research projects are based on survey responses from secretaries and other substitutes (Pfeffer and Sutton, 2006), rather than the responses of the CEO's, managers, or entrepreneurs that researchers claim. Thus, we are quite confident that our experiment was completed by actual entrepreneurs, which provides our study with greater external validity.

Finally, we consider the possibility that those individuals who participated in our study were somehow different from the population of experienced entrepreneurs, which could lead to response bias issues (Armstrong and Overton, 1977). In order to ensure that response bias was not a significant concern for our study we compared the demographics of our respondents to those of other decision making studies that utilized samples of experienced entrepreneurs. An excellent example is Choi and Shepherd's (2004) study that looked at entrepreneurial decision making using a sample of 55 active entrepreneurs. For their sample, they reported that 89% were male, a mean age of 41, average business experience of 16 years, and an average of 2 start-ups per entrepreneur. Comparing these demographics to those reported above for our sample we found that the demographics were very similar in terms of gender (87% male vs. 86% male), age (41 vs. 47), and number of starts (2 vs. 2.5), but slightly different in work experience (16 vs. 28).

While this comparison process is inherently imperfect, it does provide a reasonable assessment regarding the degree to which response bias is threat to our study. Generally speaking, the comparison process led us to conclude that our sample was a reasonable representation of the population of experienced entrepreneurs and that response bias most likely played a minimal role in the outcome of our study.

## CHAPTER FIVE

### DATA ANALYSIS AND RESULTS

#### 5.1 Reliability & Validity Analysis

The first step in the data analysis process was to explore the data for any outliers or evidence that the experiment was not completed in a thoughtful manner. As such, we visually explored the data and then proceeded to ensure that all of our participants had indicated that they had fully understood the experiment instructions and the definitions. We included two questions for this purpose, one associated with the task instructions and one associated with the description of terms (see Appendix B). We found that all 57 participants answered ‘yes’ to these two validity check questions. Next, we considered the average amount of time our sample of entrepreneurs spent completing the experiment and we found that the average was 18.36 minutes. This seemed quite appropriate given that our pilot test respondents indicated that the experiment took them approximately 15 minutes on average to complete. Thus, we felt it reasonable to conclude that the entrepreneurs in our sample had most likely completed the experiment in a thoughtful manner.

In order to more thoroughly verify the reliability of our participants’ responses, we examined the entrepreneurs’ responses to the original conjoint profiles versus the repeated conjoint profiles. We conducted paired samples T-test using the original and repeat profiles that were included explicitly for this purpose (Green and Srinivasan, 1978). If the participants were completing the conjoint experiment in a reliable way, we would expect there to be no significant difference between each of the original profiles and the repeated profiles (Hair et al, 2006). As previously discussed, there were three

repeat profiles included in the conjoint experiment. For the first repeat profile the mean of the original was 3.19 and the repeat was 3.33 and this mean difference was not statistically significant,  $T = 0.83$ ,  $p = 0.41$ . For the second repeat profile the mean of the original profile was 2.40 and the repeat was 2.33 and the mean difference was not statistically significant,  $T = 0.65$ ,  $p = 0.52$ . For the third repeat profile the mean of the original profile was 3.33 and the repeat was 3.47 and the mean difference was not statistically significant,  $T = 1.0$ ,  $p = 0.32$ . Taken collectively, the results of the paired sample T-test indicate that there were no significant differences between the original profiles and the repeat profiles. Obviously, we cannot be entirely sure that the participants were giving maximum effort and attention to the conjoint experiment, however the test-retest reliability analysis does provide some validity to the idea that the participants were not simply randomly responding to the experiment. In addition the test-retest analysis allowed us to feel reasonably confident that the 57 participants completed the experiment in thoughtful and reliable manner and that our experiment was constructed in a way that resulted in a reasonable level of internal validity.

Next we explored the reliability and validity of our individual difference measures for fear of failure and general self efficacy. Because both scales were adopted from previous research we ran a confirmatory factor analysis. For the fear of failure scale results indicated, as expected, that all of the items loaded onto a single factor. For the general self-efficacy scale results indicated, as expected, that all of the items loaded onto a single factor. In addition, we conducted a reliability analysis for each scale and found that the fear of failure scale had a Cronbach's alpha of .84 and the general self-efficacy scale had a Cronbach's alpha of .89. Statisticians have posited that a Cronbach's alpha

above .7 indicates that the measurement scale can be considered reliable (Hair et al. 2006). As such, we felt confident that our measurement scales were internally consistent and highly reliable and were quite suitable for inclusion in our final data analysis.

## **5.2 Repeated Measures ANOVA Analysis**

We used a mixed model repeated measures ANOVA to test our hypotheses. In order to successfully apply this technique to our conjoint data, we first tested the statistical assumption of sphericity. Sphericity can be thought of as an extension of the homogeneity of variance assumption and refers to the equality of variance between treatment levels with the assumption that equality of variance exists (Field, 2000). This assumption is tested via the Mauchly's test, which tests the hypothesis that the variance of the differences between conditions is equal. However, this test is only applicable if there are more than two levels of the factor, which in our case only density qualifies. Thus, if the Mauchly's test is significant for density then statistical adjustments to the degrees of freedom must be made to obtain an accurate F statistic and  $p$  value (Hair et al., 2006). In our case the Mauchly's test for the density variable was significant,  $\chi^2(2, N=57) = 12.08, p < 0.01$ . This means that any time the ANOVA is including the density variable the results must be subjected to an adjustment of the degrees of freedom. There are several different adjustments that can be made using the options available in SPSS. However, the Greenhouse-Geisser correction is the most commonly used because statisticians have shown that this approach is the most conservative and provides the most reliable F statistic when the assumption of sphericity has not been satisfied (Hair et al., 2006; Field, 2000). Thus, the F statics reported for founding rates and dissolution rates are unadjusted (there is no difference between the original and the Greenhouse-Geisser



corrected statistic), but when we consider the effects of density levels, or any interaction therein, all statistics and their corresponding degrees of freedom are reported using the Greenhouse-Geisser correction.

The next step in our data analysis process was to test our hypotheses for the main effects of founding rates, dissolution rates, and population density levels on the decision to invest in an opportunity. More specifically, our first hypothesis argued that the entrepreneurs' decisions to invest in new venture creation would be greater when founding rates were high rather than low. The results of the repeated measures ANOVA analysis showed that there was a significant main effect for founding rates,  $F(1,15) = 25.78, p < .001$ . Examination of the estimated marginal means (see Table 1) revealed that the entrepreneurs' in our sample were more likely to decide to invest in the creation of a new venture when founding rates were high ( $M=3.01$ )<sup>1</sup> than when they were low ( $M=2.56$ ). Thus, our first hypothesis was supported. In addition, we calculated the Eta-squared value as a measure of effect size and found that founding rates explained 20.5% of the variance in the decision to invest.

**Table 1: Estimated Marginal Means for Each Factor**

<b>Factor</b>	<b>Low Cond.</b>	<b>Moderate Cond.</b>	<b>High Cond.</b>
Founding Rates	2.641*	N/A	2.994
Dissolution Rates	3.155	N/A	2.480
Density Levels	3.022	2.996	2.434

\*D.V. is "likelihood of investment" measured on a 5 point Likert scale.

<sup>1</sup> All reported means are estimated marginal means for the dependent variable "likelihood of investment".

Our second hypothesis asserted that the entrepreneurs' decisions to invest in new venture creation would be greater when dissolution rates were low rather than high. Our logic was that as entrepreneurs see a large number of firms leaving the industry they would interpret this as a signal that there are fewer opportunities for entrepreneurship within the population. Our analysis provided strong supported this premise as our ANOVA showed a highly significant main effect for dissolution rates,  $F(1,15) = 20.12, p < .001$ . Comparison of the estimated marginal means revealed that our sample of entrepreneurs' were much more likely to decide to invest in the creation of new business when dissolution rates were low ( $M=3.16$ ) than when they were high ( $M=2.47$ ). As such, our second hypothesis was also supported. Here again, we also calculated the Eta-squared value as a measure of effect size and found that dissolution rates explained 41% of the variance in the decision to invest.

Hypothesis three focused on the effects of population density on the entrepreneurs' decisions to invest in new venture creation. More specifically, we argued that entrepreneurs' would be more willing to invest when population density was moderate, rather than when it was low or high. Our hypothesis test revealed that there was significant main effect for density,  $F(1.26,19.01) = 8.48, p < .01$ . More specifically, our sample of entrepreneurs were more likely to invest when population density was low ( $M=3.02$ ) or when it was moderate ( $M=2.97$ ) than when it was high ( $M=2.43$ ). Because the ANOVA analysis tests for any difference between all levels of the variable, we conducted a series of pair-wise comparisons using a Bonferroni alpha adjustment to compensate for the impact of conducting such comparisons (Hair et al., 2006). The results of these tests suggested that there was no significant difference between low and moderate

levels of density,  $F(1,15) = 1.22, p >.05$ . However, there was a significant difference between the low level and the high level,  $F(1,15) = 8.67, p <.01$ , and between the moderate level and the high level  $F(1,15) = 9.37, p <.01$ . Thus, hypothesis three was not supported because we argued that the moderate level would result in the greatest willingness to invest. In contrast, we found that the low and moderate levels resulted in about the same level of investment, but both the low and moderate levels were preferred to the high level, which is consistent with the general logic of the argument associated with the third hypothesis. Finally, we calculated the Eta-squared value as an indicator of effect size and found that density levels explained 15.5% of the variance in the decision to invest.

Following the test of our main effect hypotheses (1-3) we investigated the potential that there may be significant interaction effects between founding rates, dissolution rates and density level. While we did not develop specific hypotheses regarding these potentially complex interaction effects, our research design allowed us to explore these effects and we felt that it was worth investigating. As such, we first explored the interaction between density levels and founding rates. The conjoint results showed that the interaction effect was not significant,  $F(2,14) = 1.73, p >.10$ . Next, we tested for a significant interaction effect between dissolution rates and density levels. Results showed that there was a non-significant interaction effect between dissolution rates and density,  $F(2,14) = 2.68, p >.10$ . Finally, we explored the possibility that there may be a significant interaction effect between founding rates and dissolution rates. The results of the conjoint experiment showed that there was not a significant interaction between foundings and dissolutions  $F(1,15) = 1.13, p >.10$ . Looking at these results collectively, it is clear that none of the interaction effects were significant at the .05 level.

This seems to indicate that the interactions between founding rates, dissolution rates, and density levels likely played a rather limited role in the entrepreneurs' decision to invest in new venture creation. Obviously, further research is needed before we can confidently conclude that these interaction effects do not play an influential role in the entrepreneurial process, but we found little support for these relationships in our study.

### **5.3 Mixed Model Repeated Measures ANOVA Analysis**

The last two hypotheses consider the influence of individual differences on the relationships explored in hypotheses one through three. More specifically, we considered the individual differences of fear of failure and general self-efficacy. Hypothesis four argued that entrepreneurs' would be more likely to invest in an opportunity when they are less afraid of failure. In order to explore this hypothesis, we first calculated the mean and standard deviation for the fear of failure scale using the sample of 57 participants. These calculations showed that, for our sample, the mean fear of failure value was 2.32 (on a 5 point scale) and the standard deviation was .92. Next, we tested hypothesis four by adding the fear of failure variable to the mixed model ANOVA as a between subjects factor (Field, 2000). The results of the omnibus F test revealed a significant relationship between the entrepreneurs' fear of failure and the decision to invest,  $F(15,15) = 2.37, p < .05$ . Further exploration of the estimated marginal means revealed that, as hypothesized, entrepreneurs' who were less afraid of failure were more likely to invest in an opportunity. For example, the estimated marginal means ( see Table 2) revealed that for those who rated low (1 on 5 point scale) on the fear of failure scale the marginal mean for investment was 3.10, while those who rated high on the scale (4 on a 5 point scale) had a marginal mean investment of 2.36. These results provide support for the logic of

hypothesis four and we can say that from a statistical point of view hypothesis four was supported, with the effect just below the widely accepted .05 significance level.

**Table 2: Estimated Marginal Means for Fear of Failure**

Fear of Failure	Mean*	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
1.00	3.100 <sup>a</sup>	.188	2.699	3.501
1.20	3.500 <sup>a</sup>	.420	2.604	4.396
1.40	2.900 <sup>a</sup>	.178	2.520	3.280
1.60	2.781 <sup>a</sup>	.182	2.393	3.169
1.80	2.903 <sup>a</sup>	.221	2.431	3.375
2.00	2.611 <sup>a</sup>	.162	2.266	2.956
2.20	2.500 <sup>a</sup>	.420	1.604	3.396
2.40	2.431 <sup>a</sup>	.221	1.958	2.903
2.60	3.021 <sup>a</sup>	.257	2.472	3.569
2.80	2.458 <sup>a</sup>	.297	1.825	3.092
3.00	2.778 <sup>a</sup>	.243	2.261	3.295
3.20	3.861 <sup>a</sup>	.243	3.344	4.378
3.40	2.583 <sup>a</sup>	.257	2.035	3.132
3.60	2.083 <sup>a</sup>	.420	1.188	2.979
3.80	2.778 <sup>a</sup>	.243	2.261	3.295
4.00	2.361 <sup>a</sup>	.243	1.844	2.878

a. Based on modified population marginal mean.

\*Overall mean based on all 12 conjoint profiles.

We did not specifically develop hypotheses regarding the potential for interaction effects between fear of failure and each of the population level factors, we felt that it was worth briefly exploring these relationships. The results of this analysis revealed that there were no significant interaction effects between fear of failure and founding rates,  $F(15,15) = 1.65, p > .10$ ; between fear of failure and dissolution rates,  $F(15,15) = .250, p > .10$ ; nor between fear of failure and density levels,  $F(30,28) = 1.21, p > .10$ . Building on

our findings for the main effect, it appears that fear of failure has a general influence on the investment decision, but does not seem to influence the relationship between any one factor and the investment decision in a discernable way.

Finally, our fifth hypothesis argued that the individual difference of general self-efficacy would influence entrepreneurs' investment decisions. Descriptive statistics for the general self-efficacy variable revealed a mean of 4.48 (on a 5 point scale) and a standard deviation of .44. This seems to indicate that, in general, our sample of entrepreneurs' were quite confident in their abilities. We tested our final hypothesis by adding the general self-efficacy variable to the mixed model ANOVA as a between subjects factor (Field, 2000). For the main effect test our results indicated that, for our sample, there was not a significant relationship between self-efficacy and the investment decision,  $F(11,15) = 1.01, p > .10$ . Thus, our fifth hypothesis was not supported. However, an examination of the estimated marginal means (see Table 3) indicated that the entrepreneurs' who rated on higher on the self efficacy scale (5 on a 5 point scale) had an overall average investment response of 3.01 compared to those who ranked lower (3 on a 5 point scale) with an average investment response of 2.17. These mean values provide some support for the general logic of our final hypothesis; however these mean differences were not statistically significant. As such, we concluded that, in general, self efficacy played a rather limited role in the entrepreneurs' decisions to invest in an opportunity.

**Table 3: Estimated Marginal Means for Self-Efficacy**

Self- Efficacy	Mean*	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
3.00	2.167 <sup>a</sup>	.420	1.271	3.062
3.75	2.333 <sup>a</sup>	.420	1.438	3.229
3.88	2.885 <sup>a</sup>	.182	2.498	3.273
4.00	2.931 <sup>a</sup>	.221	2.458	3.403
4.13	2.750 <sup>a</sup>	.197	2.331	3.169
4.25	2.167 <sup>a</sup>	.420	1.271	3.062
4.38	2.917 <sup>a</sup>	.214	2.461	3.373
4.50	2.692 <sup>a</sup>	.178	2.312	3.072
4.63	2.711 <sup>a</sup>	.175	2.338	3.084
4.75	2.625 <sup>a</sup>	.210	2.177	3.073
4.88	3.069 <sup>a</sup>	.221	2.597	3.542
5.00	3.012 <sup>a</sup>	.136	2.723	3.302

a. Based on modified population marginal mean.

\*Overall mean based on all 12 conjoint profiles.

Here again we did not develop specific hypothesis that predicted interaction effects between self-efficacy and the investment decision. However, we felt that exploration of these relationships was warranted. Our results showed that there was no significant interaction between dissolution rates and general self-efficacy,  $F(11,15) = .55$ ,  $p > .10$ , nor between density and general self-efficacy,  $F(22,28) = 1.22$ ,  $p > .10$ . Interestingly, we did find a significant interaction between founding rates and general self-efficacy,  $F(11,15) = 2.62$ ,  $p < .05$ . Thus, it appears that self-efficacy may not have had an overall effect on the sum of the decision, but may have had a small influence as participants evaluated how they would respond to founding rates. When combining this finding with our findings for the main effect of founding rates, logic suggests that this finding implies that those with greater levels of self-efficacy may be even more likely to

invest when founding rates increase than those with lower levels of self efficacy. Of course, more research is needed to confirm and untangle the complicated interaction that may exist between self-efficacy and the signals founding rates provide to entrepreneurs.

#### **5.4 Factor Importance**

The results reported above for the testing of the main effect hypotheses (H1-H3) were accompanied by an Eta-squared calculation for each of factor. Eta-squared was calculated by dividing the sum of squares for the within subject effect and dividing it by the sum of squares for of the effect plus the interactions plus error (i.e., sum of squares total). The results of these calculations revealed that dissolution rates explained 41% of in the investment decision, founding rates explained 21%, density levels explained 15 %, and error explained the remaining 23%. These results are insightful because the ANOVA analysis revealed that there was a significant main effect for each factor, but we wanted to be sure that these effects were of a meaningful proportion and to determine which factor was the most important in the decision to invest in an entrepreneurial opportunity. We see from the Eta-squared analysis that participants used the dissolution rates as the most important factor when looking to population rates as signals of entrepreneurial opportunity availability. This finding is consistent with the work of Jackson and Dutton (1988) who found that strategic decision makers were much more likely to detect and respond to threats rather than opportunities. A complete summary of results for all of the hypotheses tests, post-hoc analysis and the Eta-squared values are provided for review in Table 4 below.



**Table 4: Summary of Hypotheses Tests and Eta-squared Calculations**

<b>H1:</b> High founding rates = more likely to decide to invest	Supported $p < .001$								
<b>H2:</b> Low dissolution rates = more likely to decide to invest	Supported $p < .001$								
<b>H3:</b> Moderate density levels = more likely to decide to invest	Not Supported* $p > .05$								
<b>H4:</b> Less afraid of failure = more likely to decide to invest	Supported $p < .05$								
<b>H5:</b> Higher self-efficacy = more likely to decide to invest	Not Supported $p > .05$								
<b>Post Hoc:</b>									
Interaction between founding rates & density levels	Non-significant $p > .05$								
Interaction between dissolution rates & density levels	Non-significant** $p > .05$								
Interaction between founding rates & dissolution rates	Non-significant *** $p > .05$								
Interactions between fear of failure, self-efficacy, and founding rates, dissolution rates, density levels.	All Non-significant $p > .05$								
<b>Eta Squared (N<sup>2</sup>):</b> % of variance in D.V. explained	<table> <tbody> <tr> <td>Dissolution rates</td> <td>41%</td> </tr> <tr> <td>Founding rates</td> <td>21%</td> </tr> <tr> <td>Density levels</td> <td>15%</td> </tr> <tr> <td>Error</td> <td>23%</td> </tr> </tbody> </table>	Dissolution rates	41%	Founding rates	21%	Density levels	15%	Error	23%
Dissolution rates	41%								
Founding rates	21%								
Density levels	15%								
Error	23%								
<p>*Entrepreneurs were more likely to decide to invest when density was low or moderate than when it was high (<math>p &lt; .01</math>).</p> <p>** Entrepreneurs were more likely to decide to invest when density levels were low &amp; dissolution rates were moderate (<math>p = .09</math>).</p> <p>*** Entrepreneurs were more likely to decide to invest when founding rates were high &amp; dissolution rates were low (<math>p = .06</math>).</p>									

## CHAPTER SIX

### DISCUSSIONS, IMPLICATIONS, AND LIMITATIONS

#### 6.1 Effects of Foundings, Dissolutions, and Density

The main objective of this thesis was to explore the influence of population level conditions on entrepreneurs' decisions to invest in an entrepreneurial opportunity, and to understand how the individual differences of fear of failure and general self-efficacy might alter that influence. To that end, we developed a series of hypotheses that identified the potential impact of population level founding rates, dissolution rates, and density levels on the entrepreneurs' decisions to invest. We also developed hypotheses that identified the role that the individual trait differences of fear of failure and general self-efficacy may play in altering the influence of the population level condition on the investment decision. We tested these hypotheses using a conjoint experiment with a sample of experienced entrepreneurs serving as participants in our experiment. The results provide several interesting points for discussion.

First, we considered the impact of differential levels of founding rates on entrepreneurs decisions to invest in an entrepreneurial opportunity. Hannan and Carroll (1992) used an ecological perspective and the assumption of a fixed resource space to argue that high founding rates are likely to constrain entrepreneurial activity by sending a signal to entrepreneurs that the resource space is overcrowded. However, the existing entrepreneurship literature challenges this argument and suggests that high entry rates are likely to reduce uncertainty in the mind of the entrepreneur resulting in an increase in entrepreneurial activity (Choi and Shepherd, 2004; McMullen and Shepherd, 2006). We selected the latter perspective in the development of our founding rate hypothesis and argued that entrepreneurs would be more likely to decide to invest in an opportunity

when founding rates were high rather than low. Our results supported our hypothesis and indicated that there was a significant main effect for founding rates on the investment decision in the hypothesized direction.

From an ecology standpoint, this finding is counter to the negative opportunity signal direction that Hannan and Carroll (1992) argue, but is consistent with the general idea that population rates may provide opportunity signals to entrepreneurs. For example, in the Aldrich (1999) branch of ecology it is implied that the rate of new firm foundings may have a significant effect on the willingness of entrepreneurs to enter the population. Similarly, another group of ecologists have posited that founding rates may provide a perceptual signal about the opportunity structure and the current drain on important resources (Delacroix. and Carroll, 1983; Dowell and Swaminathan, 2006). Our results provide empirical support for the ecological notion that the rate of new firm foundings provides a signal to entrepreneurs regarding new venture viability. Moreover, we provide some insights into the directionality debate by revealing that in our sample of experienced entrepreneurs the condition of high founding rates resulted in greatly likelihood of investment in new venture creation. As such, one may infer that high founding rates are likely to be interpreted by entrepreneurs as a positive signal of opportunity availability, rather than a negative signal of resource scarcity.

Our results for the positive effects of new firm foundings on entrepreneurial action are also consistent with the entrepreneurship literatures suggestion that when entrepreneurs perceive lower levels of uncertainty they are more likely to engage in entrepreneurial action (McMullen and Shepherd, 2006). One significant source of uncertainty for entrepreneurs is demand uncertainty, which is the degree of value

customers will place on new product or service being offered to the market (Choi & Shepherd, 2004). Thus, as the number of new firm foundings increases, the amount of demand uncertainty is likely to decrease for the entrepreneur considering the formation of a new firm within that industry. Our results seem to suggest that the entrepreneurs in our sample felt less uncertain when founding rates were high than when they were low. Admittedly, we did not directly measure uncertainty. However, we feel that that the degree of uncertainty can be inferred from the entrepreneurs investment decisions. In any case, the central point is that entrepreneurs were more likely to decide to invest in an opportunity when founding rates were higher, and this is consistent with the logic contained in the entrepreneurship literature.

In addition to the discussion above, there may be an alternate explanation for the effects of founding rates that has been only loosely considered by ecologist and entrepreneurship scholars. Our results are consistent with a phenomenon that some in the finance and behavioral economics disciplines have called 'herding behavior' (e.g., Banerjee, 1992; Clement and Tse, 2005; Ariely, 2008). Herding behavior occurs when individual decision makers determine their optimal course of action based on the behaviors of others with little regard to private information (Bikhchandani, Hirschleifer, and Welch, 1992). Herding behavior is likely to take place under conditions of high uncertainty and when the decision maker has little information to base the decision on (Bikhchandani et al., 1992; DiMaggio and Powell, 1983). In our case, the nature of opportunity evaluation is inherently uncertain and we explicitly limited the opportunity information to population level rates. Thus, it is possible that the entrepreneurs in our study, whether consciously or unconsciously, may have chose to invest in an opportunity

simply because the population rates indicated others were doing so at high rates (e.g., high founding rates).

One of the major problems with herding behavior is that the decision to found a new venture may be irrationally based on the action of others and not on market realities. Thus, we would expect that as the ‘herd’ of entrepreneurs rush to market there would be an extraordinary, and potentially unnecessary, high rate of failure. This creates a rather interesting dichotomy in that the use of founding rate data may reflect a high degree of rationality and prudence, as suggested by existing ecology and entrepreneurship theory. However, founding rate data may also serve as an impetus for herding behavior which could be very dangerous for the entrepreneur. Our research was not designed to capture the existence or effects of herding behavior, but future research could seek to untangle the behavioral psychology behind the entry rates – investment decision relationship that we have supported with our data. The existing literature on herding behavior may serve as a logical theoretical basis for such an investigation. The substantial literature on neo-institutional theory may also serve as a theoretical foundation for exploring herding behavior in entrepreneurship. Neo-institutional theory speaks to the mimetic (a.k.a., isomorphism) behavior reflected by the herding phenomena, but does from an organizational perspective (DiMaggio and Powell, 1983; Haunschild and Miner, 1997; Mizruchi and Fein, 1999). As such, researchers would have to carefully apply neo-institutional theory concepts to the individual level of analysis, but use of this perspective could provide novel insights into the decision making of entrepreneurs as they engage in new venture creation activities.

Another main point of discussion is our finding of a significant main effect for dissolution rates on the opportunity investment decision. More specifically, we found that entrepreneurs were less likely to decide to invest in an opportunity when dissolution rates were high, as opposed to low. This finding was consistent with our hypothesis and the existing ecology based perspective that asserts a direct relationship between dissolution rates and the creation of new ventures within a given population (e.g., Barnette and Amburgey, 1990). Moreover, Aldrich and Wiedenmayer (1993) have argued that dissolution rates may influence the creation of new firms in two ways: (1) existing firms tie up valuable resources that can only become available for new firm creation if existing firms dissolve, and (2) high exit rates may serve as a signal to entrepreneurs that the population has exceeded capacity, thereby turning away potential founders. However, to the best of our knowledge, the relationships that Aldrich and Wiedenmayer (1993) suggest have not been subjected to an empirical test using the individual or the individual's decisions as the unit of analysis. Our research takes a step in this direction and our results revealed that the entrepreneurs in our sample perceived high dissolution rates as threat signals (Jackson and Dutton, 1988) and not as opportunity signals based on enhanced resource availability. Thus, our data indicates that even though dissolutions may free-up key resources, these resources are likely to be ignored by entrepreneurs because of the negative perception of the availability of opportunities within the population (Aldrich and Wiedenmayer, 1993).

In a similar vein, Barnett and Amburgey (1990) also explored the impact of dissolution rates on new venture creation using population level data. They examined a number of telephone companies and found that as dissolution rates increased the number

of new firm foundings decreased. Their subsequent assessment of this finding implied that as the number of dissolutions increased potential new entrants became discouraged. However, this conjecture was made using data and results at the population level and the researchers did not collect data at the individual level, calling into question the validity of their conclusion. In contrast, our study provides data at the level of the individual entrepreneurial decision and shows that, consistent with Barnett and Amburgey (1990) findings, the entrepreneurs in our sample were less likely to decide to invest in an opportunity when dissolution rates were high. Thus, we provide additional support for the conjectures made in Barnett and Amburgey's (1990) population level study.

Further exploration of the dissolution rate signals discussed above reveals another potential explanation for the relationship between dissolution rates and entrepreneurial opportunity investments. Based on the entrepreneurial cognition research, we previously argued that dissolution rates would influence perceptions of opportunity related uncertainty, desirability, and feasibility (Krueger, 2000). We adopted the perspective that increased levels of uncertainty would lead to negative perceptions of opportunities, thereby constraining entrepreneurial action (McMullen and Shepherd, 2006). Our findings suggest that as dissolution rates increase, it is likely that negative perceptions of the opportunity also increase. Thus, despite the fact that entrepreneurs may be able to readily acquire resources, perhaps at substantially discounted prices, the resource advantage is likely to be overwhelmed by increased perceptions that the opportunity is not desirable or feasible (Krueger, 1993). In this way, our results suggest that entrepreneurs are likely to consider high dissolution rates to be a signal to avoid entrepreneurial action. Because entrepreneurs often use data classification systems to

simplify information (Dutton and Jackson, 1987) it appears that high dissolution rates tell the entrepreneur that “there is no opportunity here” and that investments in attention, time, and capital should be focused elsewhere.

A third major point of discussion is our finding of a significant main effect for the effects of density levels on the opportunity investment decision. Specifically, we found that entrepreneurs were more likely to invest in an opportunity when density was low or moderate than when it was high. This finding is relatively consistent with the ecology literatures argument that population density influences entrepreneurial activity by way of legitimation and competition (Hannan, 1986). The argument is that in the early stages of the population an increase in density provides increased legitimacy, thus attracting entrepreneurs. However, as the population grows, resources become more difficult to obtain and the effects of legitimacy give way to competitive forces, thereby dissuading entrepreneurial action. Our results provide some support for the general logic of the ecologist argument, but there are few areas where our findings diverge from the ecology arguments. First, ecology theory suggests that at low levels of density the population lacks legitimacy and entrepreneurs will be discouraged from entering the market (Hannan and Carroll, 1992). However, our results showed that entrepreneurs were more likely to invest when density levels were low or moderate, indicating that the legitimacy issue associated with low density may not be the entrepreneurial deterrent that ecologists think it is. Second, the ecology logic implicitly suggests that the highest level of investment should occur when density levels are moderate, as this level may serve to represent a balance between the competing forces of legitimation and competition (Carroll and Hannan, 1992). However, we did not find support for this logic. Rather, we found that



the entrepreneurs in our sample were equally likely to invest in an opportunity when density was low as when it was moderate. But, when density became high the entrepreneurs had a much more negative view of opportunity based investing within the population. Thus, it appears that low and moderate levels of density provide entrepreneurs with signals that indicate reasonably fertile ground for entrepreneurial action. Alternatively, it appears that high density levels constrain entrepreneurial action by signaling that there are limited opportunities for new venture creation within the population.

Moving from the ecology literature to the entrepreneurship literature provides us with another potential explanation for the impact of density on the opportunity investment decision. Here again, the entrepreneurial cognition literature suggests that different levels of population density are likely to impact the perceived level of uncertainty, desirability, and feasibility associated with an opportunity (e.g., Krueger, 1993; Mitchell et al., 2007; McMullen and Shepherd, 2006). When population density is low, entrepreneurs are likely to perceive that there is an unfulfilled market need and the opportunity space is abundant. Alternatively, high levels of population density may increase the perceptions that a new venture may not be desirable or feasible because the current competitive landscape is placing heavy resource constraints on new entrants. The results of our study seem to be generally consistent with the logic suggested by entrepreneurial cognition researchers (e.g., Krueger, 2000; Mitchell et al., 2007). By this we mean that our findings suggest that entrepreneurs are likely to perceive low and moderate density levels as a situation in which entrepreneurial action is warranted. In contrast, these same entrepreneurs indicated that as density levels increase these

perceptions change to a more pessimistic view. When density is high entrepreneurs seem more likely to perceive high density levels as an indicator of a crowded resource space with few reasons to engage in new venture creation activities. When taken in the broader opus of the study the density findings are especially interesting given the founding rate findings. High founding rates encouraged entrepreneurial action, but high density discouraged it. However, high founding rates are likely to lead to higher density levels (holding dissolution rates relatively constant). As such an interesting avenue for future research could be to examine the transition point between when the positive effects of founding rates are overpowered by the negative effects of density.

A fourth point of discussion is our finding that there was relatively little evidence for interaction effects between founding rates, dissolution rates, and density levels. Based on the ecology and entrepreneurship literature one could argue that entry rates, dissolution rates, and density levels may interact to impact the opportunity investment decision, but this was not the case in our study. These findings suggest that entrepreneurs may closely consider each of these rates as independent information and seek to make a judgment based on the level of each rate. This seems to fit with the work of Dutton and Jackson (1987) and Krueger and Dickson (1994) who have found that strategic decisions are influenced by the way the decision maker categorizes new information. It is also possible that the participants were primarily basing their decisions on only one factor and paying little heed to the other factors. Our data provides some support for this explanation as the results of our Eta-squared calculations revealed that 41% of the variance in the investment decision was explained by dissolution rates. Thus, it is possible that as a way to filter information participants primarily based their investment

decisions on dissolution rates, which resulted in the lack of significance of the interactive relationships. Further replication research using a diverse set of methodological tools is needed before we can confidently conclude that the interactions between the various population rates have little influence on the decision to invest in an opportunity.

## **6.2 Effects of Individual Differences**

The results of our study revealed a significant effect for the individual differences of fear of failure and a non-significant effect for general self-efficacy on the investment decision. This finding is interesting given the substantial amount of social psychology research that shows that both of these individual differences are likely to influence decision making processes in a variety of context (Atkinson, 1957; Birney, et al., 1969, Elliot and McGregor, 1999, Bandura, 1997; Krueger, 2000). However, our findings are consistent with the entrepreneurship literature that has found mixed support for the influence of individual differences, especially in the context of entrepreneurial action (Stewart and Roth, 2001; Zhao and Siebert, 2006; Rauch and Frese, 2007; Wood & Pearson, 2009). One possible explanation comes from our samples previously reported descriptive statistic for the fear of failure and general self-efficacy scales. These statistics indicated that our sample was generally biased to the positive side on the self-efficacy measure and to the negative side on the fear of failure measure. More importantly, the standard deviation of for the fear of failure variable was .92 and for the self-efficacy variable it was .44. This means that there was rather limited variance for the self-efficacy variable within our sample of experienced entrepreneurs. This finding is consistent with other samples of experienced entrepreneurs, who have generally perceived themselves as quite competent (e.g., Chandler & Jansen, 1992; Mitchell, 2006). This suggests that we

need to look beyond sample bias as an explanation for the individual difference findings in our study.

Sarasvathy et al.'s (1998) work on the categorization of opportunity based information and Dutton and Jackson's (1987) work on opportunity versus threat perceptions as determinates of strategic behavior seems to offer some additional insights on our individual difference findings. More specifically, in the Dutton and Jackson (1987) study the researchers found that strategic decision makers often categorize information into threats or opportunities and this categorization process impacted strategic decision making outcomes. Kruger and Dickson (1994) further tested Dutton and Jackson's (1987) opportunity model and found that self-efficacy influenced opportunity and threat perceptions, but did so in an indirect manner. More specifically, they identified that self-efficacy influenced perception by altering the degree of risk-taking that the decision makers felt they would be involved in given a specific course of action. Thus, risk-taking became the key mediating variable.

If the Dutton and Jackson (1987) model holds in the context of entrepreneurial action, their work provides one possible explanation for the limited support for the effect of self-efficacy in our study. Because our research methodology did not require the entrepreneurs to actually take risks, then the key mechanism by which individual differences influence decision making may have been absent from our model. A similar conjoint study by Wood and Pearson (2009) lends some support to this argument as their study also found negligible support for the influence of self-efficacy in the investment decision given differential levels of uncertainty, knowledge relatedness, and richness of information. Thus, future research needs to do a better job of incorporating the risk

variable before we can confidently argue that the individual difference of general self-efficacy plays a only a limited role in the decision to invest in an entrepreneurial opportunity given specific population level conditions.

### **6.3 Implications for Theory and Practice**

This study has several important implications for organization theorists, entrepreneurship scholars and practicing entrepreneurs. First, ecology theorists have implicitly (Hannan and Carroll, 1992) and explicitly (Aldrich and Wiedenmayer, 1993; Aldrich, 2002) assumed that population level rates influence entrepreneurial activity by providing signals regarding the availability of entrepreneurial opportunities within a given population domain. More specifically, they assume that the entrepreneur's decision to engage in entrepreneurial action will be impacted by the entry rates, dissolution rates, and density levels of the target industry. Interestingly, the ecologists do not collect data at the individual level and thus are unable to credibly speak to the impact that these rates actually have on entrepreneurial decision making. Essentially, for the ecologist the behavior of the entrepreneur is a "black box" and we sought to open that box in our study. In so doing, we are better able to understand the true relationship between population rates and the entrepreneur's decision to invest in opportunities within a given population. Our results suggest that, as the ecologists have implied, these rates do have the ability to influence the entrepreneur's decision to invest attention, time, and capital into new venture creation activities.

In addition to the "black box" issue, ecology scholars who work in the density dependence branch of the ecology stream often assume that density levels are a key consideration for entrepreneurs looking to enter the population (Carroll and Hannan,

1989). In this perspective it is traditionally assumed that density levels influence entrepreneurship via the forces of legitimation and competition (Hannan, 1986). However, our study found that it was dissolution rates that were the most influential of the population level rates. Based on the traditional perspective discussed above, it seems unlikely that an increase in dissolutions would influence the legitimacy of the population, but rather they may reduce competition and free up valuable resources (Delacroix and Carroll, 1983). If this were true, then we would expect dissolutions to enhance entrepreneurial activity. Interestingly, we found the opposite to be true for our sample of entrepreneurs. This finding appears to be more consistent with the arguments of a limited number of researchers who have suggested that it is not necessarily population density, and its associated the legitimation and competitive forces, that influence entrepreneurship, but rather it may be the degree of change (i.e., population dynamics) taking place within the population (Aldrich, 2002). In this perspective entrepreneurs are better able to recognize important population level changes than the density effects of legitimation or even competition. So, regardless of population density levels, a sharp increase in foundings or dissolutions is likely to provide a recognizable signal to entrepreneurs. Our research provides some preliminary support for this argument over the traditional density dependence perspective.

In addition to ecology theory, our study has important implications for the entrepreneurship literature. Entrepreneurship scholars have paid scant attention to the relationship between population level rates and the behavior of entrepreneurs (Carroll and Khessina, 2005). However, ecology theory suggests that these factors are an important determinate of entrepreneurial activity. As such, our research takes an important first

step in the investigation of the population rates – entrepreneurial action nexus. The results of our study revealed that population level rates can have a significant effect on entrepreneurs decisions to engage in entrepreneurial action. This means that when entrepreneurs scan the environment in search of opportunities, population level data may potentially provide a key source of opportunity signals. As such, entrepreneurship scholars may wish to pay closer attention to the relationship between ecology theory tenets and entrepreneurial activity.

Another interesting implication of our research stems from our use of conjoint analysis. One of the unique features of conjoint analysis is it provides the researchers with a method for determining the importance of each manipulated factor in the investment decision. We found that, for our sample, dissolution rates explained 41 % of the variance in the investment decision, followed by founding rates at 21% and density levels at 15%. These findings are important because ecology theorists have placed the influence of population rates on entrepreneurial activity in a black-box and suggested that all three of these population rates may influence entrepreneurial behavior, but have not provided any insight regarding the weight each of these factors might play (e.g., Aldrich and Windenmayer, 1993). In fact, it is implicitly suggested in this literature that each of the population level rates is likely to have an equal influence on new venture creation activities. However, our results suggest that this is not the case. Moreover, our findings remind theorists that some aspects of the environment are likely to be more important than others as entrepreneurs engage in investment decisions. In the case of population rates, it appears that dissolution rates are preferred as a signal of opportunity availability. While we cannot definitively conclude that low dissolution rates will spur new venture

creation, it seems clear that high dissolution rates certainly dissuade entrepreneurial action.

Finally, our study provides important insights for practicing entrepreneurs. First, the results of our study suggest that entrepreneurs may want to pay close attention to population level rates, as these rates may provide opportunity signals. Moreover, it appears that high entry rates, low dissolution rates, and low or moderate density levels are likely to attract entrepreneurial activity. As such, entrepreneurs looking to reap the rewards of first mover advantage (Peteraf, 1993) may be well served by understanding the effects these rates have on attracting or discouraging new entrants. Second, our finding that entrepreneurs were more likely to decide to invest in an opportunity when founding rates are high is very interesting. Based on this finding we have previously argued that ‘herding behavior’ may be at work in these situations. Thus, entrepreneurs must carefully consider the role of population rates and the activities of fellow entrepreneurs when evaluating a potential opportunity. By placing the population rate signals within the broader context of the entire information set available one may be able to use population rates information in a discerning way, rather than simply following the actions of others. Finally, our study revealed that our sample of entrepreneurs placed a great deal of weight on dissolution rate information. This finding suggests that this group of experienced entrepreneurs looked heavily at the number of firms leaving the industry as a signal of opportunity availability or scarcity. This implies that nascent and potential entrepreneurs may want to closely consider the number of dissolutions within the population when considering the viability of new venture creation.



#### **6.4 Future Research Directions**

Our research provides an impetus for future opportunity focused research. First, we found mixed support for the effects of individual differences in the decision to engage in entrepreneurial action. This finding was somewhat surprising and may be the results of the limited variance associated with the self-efficacy measure of a function of conjoint methodology utilized. As such, future research should explore the impact of individual differences on entrepreneurial action using a diverse set of methodological tools. One suggestion may be to follow the work of Jackson and Dutton (1988), Kruger and Dickson (1994), and Sarasvathy et al. (1998) who use a variety of experimental research methodologies to understand how decision makers categorize information into opportunity versus threat schemas. Use of these types of approaches may allow researchers to consider the idea that environmental factors provide not only signals of opportunity, but also of threats, and these signals may foster or impede entrepreneurial action.

Future research should explore the inclusion of a broader set of individual difference characteristics into action based models of entrepreneurship (Romanaelli, 1989; Shane 2003; McMullen and Shepherd, 2006). For example, perceptive ability (Bhide, 2000), creativity (Schumpeter, 1934; Harper, 1996) and imagination (Shackle, 1979) have all been suggested as important individual differences that are likely to influence the entrepreneurial process. Each of these individual differences has a small group of studies that provide support for their potential role in the new venture creation process (e.g., Robinson, et al., 1991; Caird, 1991) However, the existing scholarship primarily relies on samples of entrepreneurs verse non-entrepreneurs to show that these

groups of individuals rate differently on a specific set of traits. Although informative, these studies provide little guidance as to whether or not these differences translate into an increased (or decreased) propensity for entrepreneurial action (Shane 2003). Thus, we believe that these and similar individual difference variables should be included in future research that explores entrepreneurial decision making and entrepreneurial action.

Our findings that high founding rates provides a positive opportunity signal to entrepreneurs provides another interesting opportunity for future research. Our study revealed that as entry rates increased entrepreneurs were more likely to invest in an opportunity. As previously discussed, one potential explanation for this decision is herding behavior (Banerjee, 1992). We could find little evidence that entrepreneurship scholars have considered the role of herding behavior as a potential influence on the entrepreneurial process. However, we feel that our study provides some preliminary evidence that could be used to explore the relationship between herding and entrepreneurial action. By integrating existing herding behavior theories (Bikhchandani et al., 1992) into theories of entrepreneurial action (McMullen and Shepherd, 2006) researchers may begin to untangle the relationship between these cognitive processes and the decision to engage in new venture creation. It should be noted that the degree of uncertainty, as noted by both the herding and the entrepreneurship literatures, is likely to play a key role in this research. Thus, the degree of uncertainty would have to be carefully integrated into this potentially insightful stream of research.

A fourth avenue for future research is based on our use of the ecological perspective in our study. The ecological perspective assumes that populations, or industries, follow a lifecycle model and that different phenomena are at work during

various points in the lifecycle. For example, Carrol and Hannan (1992) assert that in the early stages of the lifecycle new entrants serve to legitimize the industry and attract further foundings, but at the later stages competitive forces prevail and new entrants are dissuaded from entering. Unfortunately, because of our research design we were only able to consider the influence of population level factors as rather static influences. This allowed us to show that the various population level rates did have an influence on the entrepreneur's decision to invest in an opportunity, but future research should seek to integrate the dynamic aspect of the ecology perspective. Naturally, there are many challenges to this type of research, including the measurement of competition and legitimation. However, this approach would provide new insights into the transition points between competitive and legitimating forces and whether or not entrepreneurs are able to identify those crucial transition points.

A final possibility for future research flows from potentially important variables that remained exogenous to the theoretical model developed in this thesis. Because our study focused on the effect of population level rates, and populations are commonly operationalized as industries, future research should consider the influence of additional industry level variables on entrepreneurial action. For example, researchers may consider the size of the industry, industry profitability, capital intensity of the industry, and average size of firms and other similar variables (see Shane, 2003 for a brief overview). Extant literature indicates that these variables are likely to be influential, but are primarily evaluated at the macro level. Our study provides some theoretical and methodological guidance as to how researchers may be able to explore the influence of these variables at the level of the entrepreneur or the entrepreneur's decision making.

## **6.5 Limitations to the Research**

As with all empirical research, the methodology used in our study has clear strengths and limitations. The use of a conjoint paradigm allowed the efficient manipulation of variables cleanly, providing initial insights into possible causal relationships. Yet, profile based research also raises questions regarding construct validity and generalizability. Conjoint profiles represent a simplified reality and can only simulate the complexity of real world conditions associated with an actual entrepreneurial opportunity. Moreover, an individual's actual behavior in such situations may differ from their predicted reactions and may also be subject to subconscious influences that the experimental design did not readily tap into. However, we sought to minimize the impact of the inherent weaknesses associated with the conjoint approach by recruiting experienced entrepreneurs, including repeat profiles as reliability indicators, and asking the respondents if they clearly understood the conjoint task and terms. As such, we feel that the careful design of our study helps to address, but does not completely resolve, these limitations.

A second limitation to this study is that population rates are dynamic in nature and vary across the lifecycle of the population. The competing forces of legitimation and competition are a prime example (Aldrich, 1979). In the early stages of the population lifecycle increased density provides legitimacy to the emerging industry, but as the population grows the effects of legitimacy are overwhelmed by competitive forces (Carroll and Hannan, 1992). Unfortunately, we were unable to include the population level rates as dynamic variables that change over time. Despite this limitation, our study provides an important first step of establishing that population level factors can play an

influential role in the entrepreneurial process. Future research, may seek to integrate the dynamic nature of populations in an effort to better understand the relationships we empirically identify in our study.

A third potential limitation to our research is that several assumptions were made in the research design phase. First, we assumed that entrepreneurs do engage in environmental scanning and would be likely to consider population rates as input data in the entrepreneurial decision making process. While there is some existing research to support this assumption more is needed (e.g., Stewart, et al., 2008; Jackson and Dutton, 1988). As such, future research needs to closely consider when and how entrepreneurs use different types of environmental data, including population rates, in their investment decisions. Second, we assumed that the venture was being founded by a single individual. We recognize that, in reality, there may be multiple team members involved in the new venture creation process. Third, we assumed that entrepreneurs engaged in opportunity exploration would be rational in their evaluation of environmental data. This means that we assumed that entrepreneurs react to whatever perceived opportunity signal the population level rates provided them in a rational way and not simply ignore them. We acknowledge that, in reality, some entrepreneurs may ignore signals that opportunities exist or that few opportunities are present within a given population. Unfortunately, little data exists to know how often, under what conditions, and what type of individual is likely to ignore opportunity signals and whether they are more likely ignore positive or negative opportunity signals (see Dutton and Jackson, 1987; Jackson and Dutton, 1988, and Krueger and Dickson, 1994 for work that speaks to some of these issues). Thus, future research may use the findings presented in our study as a basis for

the exploration of the rational actor assumption in the context of entrepreneurial opportunity signal perceptions.

A final limitation of our research stems from our study's inability to speak to the "why" question. Our study shows that founding rates, dissolution rates, and population densities all have a significant effect on the decision to engage in entrepreneurial action. The study also revealed that the individual difference of general self-efficacy played a limited role in these decisions. However, the conjoint methodology does not provide a clear explanation for why the entrepreneurs in our sample responded the way they did. For example, the participants were more likely to invest in an opportunity when founding rates were high rather than low. Is this because of the legitimation forces that ecologists describe (Aldrich, 1999) or because of reduced demand uncertainty as some entrepreneurship scholars would suggest (Choi & Shepherd, 2004)? We simply cannot definitively explore these types of 'why' questions using our research design and data. However, we feel that our study provides evidence that these relationships do indeed exist, thus creating a platform for future scholarship that attempts to address the why questions.

Despite the limitations discussed above, this thesis contributes to our understanding of the entrepreneurial process by submitting specific external and internal factors associated with exploration of potential entrepreneurial opportunities to an empirical test. The results of our test provided some promising insights into the dynamics of entrepreneurial decision making. In addition, the application of the conjoint methodology provided an avenue for capturing not only the effects of each factor, but also the importance each factor plays in the decision to engage in entrepreneurial action.

Finally, this study is unique in that it has revealed important insights that increase our understanding of how differential levels of founding rates, dissolution rates, and population densities are likely to affect the decision making of individual entrepreneurs who are contemplating entrepreneurial action.

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## APPENDICES

## APPENDIX A

### INSTRUCTION SHEET, DEFINITION SHEET, AND SAMPLE PROFILE

#### TASK INSTRUCTIONS:

Thank you for your participation! Completion of the entire study should take approximately 15 - 20 minutes.

In this part of the study you will be asked to evaluate opportunities for new venture creation in a series of profiles. Your task is to decide whether or not to invest in the creation of a new business given the environmental conditions presented in each profile. When making these decisions assume that:

- You have the financial resources (or access to the resources) to invest in an opportunity, if you so choose. However, access to the physical and human resources required to exploit the opportunity may be dependent upon the environmental conditions.
- You are making decisions about the creation of a new business in your current industry.
- The general economy is relatively stable (not trending up or down at the present time).
- Firms entering the industry may be completely new businesses or an existing business expanding into the industry for the first time.
- Firms exiting the industry may be going completely out of business or simply choosing to compete in a completely different industry.

Please consider each profile as a separate decision, independent of all the others, you will not be able to return to profiles already completed.

For each and every profile, refer to the term definition page and use your best judgment to make the requested decision.

Important Notes: **You must respond to all questions!** Incomplete surveys cannot be included in the statistical analysis. Please be assured that your individual responses will remain completely confidential. No reference to any individual response will be made in any report or publication in a way that would allow respondent identification.

This project has been reviewed and approved by the SIUC Human Subjects Committee. Questions concerning your rights as a participant in this research may be addressed to the Committee Chairperson, Office of Research Development and Administration, Southern Illinois University, Carbondale, IL 62901-4709. Phone (618) 453-4533. E-mail: [siuhsc@siu.edu](mailto:siuhsc@siu.edu).

**Do you fully understand the task described above?**

Yes

No



## **DESCRIPTION OF TERMS:**

The description of terms will be available to you as you make each decision

### **ENTRY RATES OF NEW FIRMS**

----LOW: There are very few new firms currently entering the industry.

----HIGH: There are a great number of new firms currently entering the market.

### **EXIT RATES OF EXISTING FIRMS**

----LOW: There are very few existing firms currently leaving the industry.

----HIGH: There are a great number of existing firms currently leaving the industry

### **DENSITY OF EXISTING FIRMS**

----LOW: There are a very few established firms currently competing in the industry.

----MODERATE: There are neither very few, nor a very large, number of established firms currently competing in the industry.

----HIGH: There are a very large number of established firms currently competing in the industry.

**Do you understand the description for each term?**

Yes

No

**SAMPLE PROFILE:**

**Environmental Conditions**

- 1. FOUNDING RATES OF NEW FIRMS ----- LOW** (there are very few new firms currently entering the industry.)
  
- 2. EXIT RATES OF EXISTING FIRMS ---- LOW** (there are very few existing firms currently leaving the industry.)
  
- 3. DENSITY OF EXISTING FIRMS ---- MODERATE** (there are neither very few, nor a very large, number of established firms currently competing in the industry.)

**LIKELIHOOD OF INVESTMENT**

Based on the attributes of the environment described above, how would you rate the likelihood that you specifically would invest in the creation of a new firm in this industry? (Select the number that best represents your response).

	Very Unlikely	Somewhat Unlikely	Neutral	Somewhat Likely	Very Likely
<b>Likelihood of Investment *</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## APPENDIX B

### POST-EXPERIMENT QUESTIONNAIRE

#### Self-Efficacy Scale:

Please answer the following questions about yourself using the following scale:

Not at all like me					Very much like me
1	2	3	4	5	

1. \_\_\_\_\_ I will be able to achieve most of the goals that I set for myself.
2. \_\_\_\_\_ When facing difficult task, I am certain that I will accomplish them.
3. \_\_\_\_\_ In general, I think that I can obtain outcomes that are important to me.
4. \_\_\_\_\_ I believe I can succeed at most any endeavor to which I set my mind.
5. \_\_\_\_\_ I will be able to successfully overcome many challenges.
6. \_\_\_\_\_ I am confident that I can perform effectively on many different tasks.
7. \_\_\_\_\_ Compared to other people, I can do most tasks well.
8. \_\_\_\_\_ Even when things are tough I can perform quite well.

#### Fear of Failure Scale:

Please answer the following questions about yourself using the following scale:

Do not Believe At All		Believe 50% of The Time		Believe 100% of The Time
1	2	3	4	5

1. \_\_\_\_\_ When I am failing, I am afraid I might not have enough talent.
2. \_\_\_\_\_ When I am failing, it upsets my “plan” for the future.
3. \_\_\_\_\_ When I am not succeeding, people are less interested in me.
4. \_\_\_\_\_ When I am failing, people who are important to me are disappointed.
5. \_\_\_\_\_ When I am failing, I worry about what others think about me.

**Demographic and Validation Information:**

1. How many total years of work experience do you have?
2. How many of these years have been in a different industry than your current firms industry?
3. Have you been directly involved with the start up of at least one business?
4. If you have started multiple businesses, please indicate how many.
5. Has at least one of the firms you started been intended as your primary source of income?
6. Would you classify yourself as an entrepreneur?
7. Have you experienced a previous business failure?
8. What is your gender?
9. What is your age?
10. What is the highest level of education you have completed?
11. Do you certify that this survey was completed by the person identified in the initial solicitation e-mail or letter?

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