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LETTER FROM THE EDITOR

We are extremely pleased to present the *Academy of Entrepreneurship Journal*, an official *journal* of the Academy of Entrepreneurship, Inc. The AOE is an affiliate of the Allied Academies, Inc., a non profit association of scholars whose purpose is to encourage and support the advancement and exchange of knowledge, understanding and teaching throughout the world. The *AEJ* is a principal vehicle for achieving the objectives of the organization. The editorial mission of this journal is to advance the knowledge, understanding, and teaching of entrepreneurship throughout the world. To that end, the journal publishes high quality, theoretical and empirical manuscripts, which advance the entrepreneurship discipline.

The manuscripts contained in this volume have been double blind refereed. The acceptance rate for manuscripts in this issue, 25%, conforms to our editorial policies.

As editors, we intend to foster a supportive, mentoring effort on the part of the referees which will result in encouraging and supporting writers. We welcome different viewpoints because in differences we find learning; in differences we develop understanding; in differences we gain knowledge and in differences we develop the discipline into a more comprehensive, less esoteric, and dynamic metier.

The Editorial Policy, background and history of the organization, and calls for conferences are published on our web site. In addition, we keep the web site updated with the latest activities of the organization. Please visit our site and know that we welcome hearing from you at any time, so feel free to contact us at the address below.

JoAnn C. Carland, Editor
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MANUSCRIPTS

CAN PERSONALITY DIMENSIONS INFLUENCE ENTREPRENEURIAL OCCUPATION PREFERENCE? AN EXPLORATORY STUDY OF DISPOSITIONAL INFLUENCES ON COGNITIVE PROCESSES

Jeff Brice, Jr., Texas Southern University

ABSTRACT

This study seeks to discern if there is a significant dispositional foundation for occupational preferences. Specifically, this paper seeks to determine if personality dimensions have any effect on an individual's cognitive expectancies (concerning perceived intrinsic and extrinsic occupational rewards) when considering an entrepreneurial career. Personality dimensions composing the Five-Factor Model of Personality are applied in this study and include Conscientious, Agreeableness, Extraversion, Neuroticism, and Openness to Experience. Conscientiousness determines responsibility versus inconsistency, Agreeableness measures sociability versus detachment, Extraversion determines assertiveness versus timidity, Neuroticism measures self-assurance versus insecurity, and Openness to Experience involves uniformity versus self-determination. Each of these dimensions is related to occupational preference for an entrepreneurial career and examined utilizing the Valence Model of the Expectancy Theory. The model consists of two variables, Instrumentality and Valence. Instrumentality (I) concerns the belief that the attainment of work-related goals will lead to rewards; and, Valence (V) refers to the value of those rewards to the individual.

Results indicate that individuals who are highly Conscientious are significantly attracted to an entrepreneurial career due to the intrinsic rewards of independence and a satisfying way of life. Further, individuals who are highly Open also prefer an entrepreneurial career due to the perceived satisfying lifestyle.

INTRODUCTION

A key question in the study of entrepreneurship is what factors increase the likelihood that an individual will decide to pursue an entrepreneurial career given a multitude of more traditional alternatives. Even though entrepreneurship has been recognized as a complex, multidimensional construct that has avoided stable definition (Palich & Bagby, 1995), interest in entrepreneurship education has increased dramatically around the globe. The many new hordes of entrepreneurial-

minded students seem to choose entrepreneurship as a major area of focus due to their perceptions about an entrepreneurial career and their estimated fitness for the craft of entrepreneurship. This study seeks to determine if there might be a dispositional basis (in the form of personality dimensions) to cognitions that form the preference for an entrepreneurial career (based on expected work rewards) and serves to influence prospective entrepreneurs.

Specifically, the purpose of this paper is to try to determine if there is a significant relationship between any of the personality dimensions in the Five-Factor Model of Personality and an individual's preference for an entrepreneurial career based on their cognitive estimation of perceived intrinsic and extrinsic rewards of the occupation. First, dispositional research in entrepreneurship is reviewed. Second, the Five-Factor Model of Personality is described. Next, cognitive process literature in entrepreneurship is reviewed and the expectancy theory and its possible relation to entrepreneurial career preferences is presented. Then, hypotheses are developed and the research methodology is described. Last, results are discussed and conclusions are elaborated.

LITERATURE REVIEW

This section addresses a number of the major studies contributing to the entrepreneur literature on personality traits and cognitive processes. Specifically, it will detail how the Five-Factor Model of Personality and expectancy cognitions may result in significant relations to entrepreneurial occupational preferences. To be succinct, it scrutinizes those topics that will be key variables in this study.

Personality Dimensions and Entrepreneurship

Personality traits have routinely been studied as possible differentiators of entrepreneurs from other individuals. The most common include a high need for achievement (McClelland, 1961), internal locus of control (Brockhaus & Nord, 1979), and risk taking propensity (Brockhaus, 1980; Sexton & Bowman, 1985). Unfortunately, the inconsistent results of trait-oriented research did not lead us to an authoritative conclusion of what encourages individuals to initiate entrepreneurial behavior (Shaver & Scott, 1991; Ripsas, 1998). However, the psychology literature has identified over 18,000 individual personality traits that can be used to explain human expression (Cattell, 1947). Over time this massive list has been compiled and reduced through the use of assumptions, factor analysis, and cluster analysis to as few as three higher-order personality dimensions (Buss & Finn, 1987). Personality dimensions represent distinct groupings of individual personality traits that network with each other and are expressed by repetitive patterns of human behavior. This study applies the Five-Factor Model of Personality (Fiske, 1949) as a basis for examination because it is the most broadly endorsed model in personality research (Barrick & Mount, 1991).

The Five-Factor Model of Personality

The Five-Factor Model of Personality (commonly called the Big Five) is a descriptive representation (typology) of the five major dispositional dimensions that encompass human personality. It has been used extensively in industrial psychology as a basis to measure job-related attitudes, person-organization fit, and other human resource inquiries. The personality factors comprising the Big Five are (1) Extraversion, which represents the inclination to be sociable, assertive, dynamic, and directive, (2) Agreeableness, representing the tendency to be friendly, cheerful, accommodating, and supportive, (3) Conscientiousness, comprised of two major subfactors, achievement and dependability, (4) Neuroticism, (also called Emotional Stability) which is the tendency to exhibit poor emotional adjustment and experience disparaging effects such as fear, anxiety, and rashness, and (5) Openness to Experience, which is the propensity to be inquisitive, creative, nonconforming and independent (Judge & Cable, 1997). Each dimension is scaled from high to low with high scores being representative of the most positive aspects of the dimension's characterization while low scores signify the reverse.

The origin of personality typing can be traced back to Galen's observations of Greek society in the Second Century A.D.. He framed his personality type designations on what was termed the four humors which were described as (1) Sanguine types (cheerful and upbeat), (2) Choleric types (hot-tempered and dramatic), (3) Melancholic types (fretful and worrying), and (4) Phlegmatic types (stolid and unflappable)(Hogan, 1990). While Galen's metaphors were advanced to suggest that personality types were stable and identifiable within ancient Greek culture, modern research on personality dispositions further generalizes this application to include individuals in all cultures. Staw & Ross (1985) and Staw, Bell, & Clausen (1986) performed several landmark longitudinal experiments and found that stable individual personality disposition is formed by the age of adolescence and, thereby, makes it possible to predict future behavior and attitudes in spite of key situational changes. More concisely, Staw, Bell, & Clausen (1986) showed that dispositional measures of personality significantly and reliably predicted occupational attitudes and employment behavior over a span of fifty years. The pattern of dispositional decay indicated that adolescent-stage dispositions set in motion a consistent set of behaviors and choices that later produced important consequences for the individual. Thus, it has been demonstrated that personality dimensions (traits) may be stable across time and this evidence should allow us to apply the Five-Factor Model of Personality to identify enduring occupational preferences for groups of individuals within the populous.

Cognitive Process Approach

Due to the inconclusive results in the individual personality trait-oriented research, scholars turned to studying the potential role of cognitive factors in stimulating entrepreneurship (Baron,

1998). The basic premise is that entrepreneurs differ from others based on how they think and that these differences can be modeled empirically (Das & Teng, 1997). In studying entrepreneurship, those taking this approach attempt to understand how perceptions (Cooper, Woo, & Dunkleberg, 1988), cognitive and decision-making styles (Kaish & Gilad, 1991), heuristics (Manimala, 1992), biases (Busenitz & Barney, 1997), and intentions (Bird, 1988) of entrepreneurs affect their behavior. Indeed, Shaver & Scott (1991) assert that any psychological approach to entrepreneurship must include the cognitive processes that occur within the individual entrepreneur.

The cognitive process approach allows researchers to gain insight into such inquiries as "How do entrepreneurs recognize opportunities in the market" and "What are the cognitive mechanisms that motivate entrepreneurs to pursue market opportunities?" (Baron, 1998). While both the personality-oriented and cognitive process approaches attempt to reveal something important about individual entrepreneurs, the cognitive process approach is currently much more popular in academic research (Das & Teng, 1997; Stewart, Watson, Carland, & Carland, 1998).

Contribution of the Cognitive Process View

The presence of appropriate personality dimensions that render an individual intrinsically suited for venturing does not guarantee entrepreneurial behavior. Kirzner (1973) stressed that entrepreneurs are not only those that discover market opportunities, but also that they must act upon these prospects whenever possible. Accordingly, the purpose of the cognitive process view is to explain the mechanism of consideration that results in such action.

It can be reasoned that a defining factor for entrepreneurs is the desire to pursue opportunities once they are exposed. In this context, only those individuals who are motivated enough to pursue entrepreneurial careers, in deference to other possible choices (e.g., traditional employment), can be considered entrepreneurs. The problem, however, is that there exists no consistent explanation of the mechanism of motivation for the exploitation of these tenuous opportunities (Ripsas, 1998). Therefore, this study advances the idea that a possible contributing explanation for entrepreneurial motivation is the occupational preference for an entrepreneurial career as specified by the valence model component of the expectancy theory (Vroom, 1964).

Expectancy Theory and Occupational Preference

According to the expectancy theory of motivation, individuals are rational, they understand the possible consequences of their actions, and make selections among options based on a merger of the value of the outcomes and the probability that the outcomes will be achieved (Gatewood, 1993). It is proposed, in this study, that the cognitive process of forming occupational preferences outlined by the valence model of Vroom's (1966) expectancy theory of motivation most closely identifies that which is practiced by prospective entrepreneurs. Entrepreneurs make rational

assessments, based on the satisfaction of their needs and potential outcomes of their efforts, which result in a decision whether, or not, to initiate entrepreneurial behavior or to seek safer, more traditional employment means.

Expectancy theory is divided into a multiplicative model containing four different constructs: effort-performance expectancy, performance-outcome expectancy, valence, and instrumentality (Campbell & Pritchard, 1976; Lawler, 1973; Nadler & Lawler, 1979). Effort-performance expectancy (E_1) refers to the individual's perception of the amount of effort required for successful task completion. Performance-outcome expectancy (E_2) refers to the belief that successful task completion will lead to desired outcomes. Instrumentality (I) is the belief that the attainment of outcomes will lead to other desired outcomes. Valence (V) refers to the value of the outcome(s) to the individual.

Self-efficacy is often compared with E_1 and E_2 of the expectancy theory because, at first glance, they seem to describe the same constructs. However, this is not the case. E_1 is concerned with the probability that reasonable effort will result in acceptable performance and E_2 is concerned with the probability that acceptable performance will lead to desired outcomes. Self-efficacy differs from both of these because it is a cognitive estimation; not of effort, performance, and outcomes, but of whether one has the required cognitive and emotional abilities to mobilize the effort that the expectancy theory takes for granted (Bandura, 1984). Therefore, low self-efficacy would signify that an individual may perceive that he or she cannot perform a task at any level while low expectancy would be interpreted as either the individual not being able to reach an acceptable performance-level for the effort expended (E_1) or not getting desired outcomes once the performance-level is reached (E_2). Clearly, these are different concerns but both are necessary for entrepreneurs to act on discovered opportunities.

Expectancy theory and parts of the expectancy model have a long history of having been used to explain the occupational preferences of individuals (Campbell, Dunnette, Lawler, & Weick, 1970; Lawler & Suttle, 1973; Mitchell, 1974; Wanous, Keon, & Latack, 1983; Baker, Ravichandran, & Ramarathnam, 1989; Van Eerde, & Thierry, 1996). As one of the two major initial expectancy model divisions presented by Vroom (1964), the valence model was described as being useful for the prediction of an individual's attraction (valence) for specified outcomes, which were identified as occupational preference and job satisfaction (Mitchell, 1974). As such, it is the part of the full expectancy model that revolves around a person's attractiveness for possible occupational outcomes and the perceived likelihood that one can attain these outcomes in the applicable occupation. As it relates to this study, preference for an entrepreneurial career is defined as the attractiveness of the possible rewards of entrepreneurship and the magnitude of one's belief that these rewards can be obtained (Vroom, 1964; Mitchell, 1974). Therefore, the valence model (*summation* VI) is a multiplicative function of the valence of possible entrepreneurial outcomes and the instrumentality that the occupational choice (entrepreneurship) will lead to these valuable outcomes.

Relevance of Occupational Valences to Entrepreneurship

While it has been demonstrated that the expectancy theory is a useful tool to measure situational motivation, it has never been used, empirically, to gauge the level of occupational preference (valence) for a sample of prospective entrepreneurs. This is curious considering the potential utility of the valence model for entrepreneurs. Olsen and Bosserman (1984) introduced the concept of expectancy theory to the field of entrepreneurship by stating that other approaches (hierarchy of needs and need for achievement theories) were too specific to be able to explain the motivating mechanisms for every entrepreneur. In their application of the expectancy theory, individuals were assumed to differ regarding needs and goals and people were expected to determine the course of their behavior based on satisfying those needs and desires. Since expected outcomes are considered when weighing choices about alternative career plans, individuals will be inclined to expend effort on those behaviors that are expected to result in the attainment of need-satisfying outcomes. What can be assumed, in a general context, is that an individual, who is attracted to the perceived outcomes of an entrepreneurial career, will be motivated to initiate entrepreneurial behavior if such effort is reasonably expected to result in their acquiring these valuable second-order rewards.

In this conception, the expectancy theory (valence model) is posited to be general enough to apply to all entrepreneurs. It does not attempt to delineate all of the specific needs that influence behavior because of the differences of each individual. It does, however, identify universal categories of considerations (valences and instrumentalities) that are cognitively processed to determine individual behavior over the course of time.

Generally, there are three potential reward categories that are posited to influence individuals to pursue entrepreneurial careers—the rewards of profit, independence, and a satisfying way of life (Longenecker, Moore & Petty, 2000). First, the reward of profit is the entrepreneur's expectation of earning a yield that will recompense them for the time and capital that they have devoted as well as for the risks and initiative they take in running the business. This reward is the primary basis for initiating any profit-making enterprise. Without the hope of profit, there exists no entrepreneurial opportunity (Kirzner, 1973). Second, the reward of independence is the expectation of freedom from supervision, rules, and bureaucracy (Longenecker, Moore, & Petty, 2000). This reward is symptomatic of an entrepreneur's desire to be one's own boss and experience the autonomy of pursuing whatever course holds personal interest. The reward for independence is attained and sustained as a result of profitable venturing. Lastly, the reward of a satisfying way of life is the expectation of freedom from a routine, boring, and unchallenging job and lifestyle (Longenecker, Moore, & Petty, 2000). This expectation is characteristic of entrepreneurs who view their businesses as tools of pleasure instead of work. This is a common sentiment among entrepreneurs who use their businesses as an instrument for self-expression and self-actualization (Scarbourough & Zimmerer, 2000) by using profits and products to contribute to important societal causes while

making a good living. Thus, it is proposed that these three categories of rewards are the active agents of expectancy theory (valence) cognitions within potential and actual entrepreneurs.

Personality Dimensions (Five-Factor Model) and Their Relationship to Extrinsic Work Rewards

While an individual's perception of the reward of profit may be a primary basis for initiating a profit-making enterprise (Longenecker, Moore, & Petty, 2000), the personal desire for profit or an individual's opinion about the ability of an entrepreneur to earn profits are clearly extrinsic considerations. Past research concerning the viability of utilizing, inherently intrinsic, personality dimensions to predict the attraction for extrinsic work rewards has not been fruitful (Davis-Blake & Pfeffer, 1989). While it has been demonstrated that Conscientiousness may positively, and Neuroticism negatively, predict extrinsic career success (income and occupational status) (Judge, Higgins, Thoresen, & Barrick, 1999), these results do not address the preferences that individuals hold for these work-related rewards. Nevertheless, Judge & Cable (1997) examined an individual's attraction for extrinsic rewards-oriented work cultures based on the Five-Factor Model personality dimensions. It is surmised that one's attraction for a work environment that stresses high pay for good performance and advanced career opportunities is indicative of a preference for these rewards (Judge & Cable, 1997). However, after an analysis of self-reported and peer-group surveys, it was determined that none of the Five-Factor Model dimensions could predict personal attraction for any extrinsic work-related reward oriented cultures. Accordingly, it is not theorized in this study that any of the personality dimensions will, positively or negatively, predict the preference for an entrepreneurial career based on the extrinsic reward of profit. Thus,

Hypothesis 1: *There will be no significant relationship between any of the Five-Factor Personality dimensions and Preference for an Entrepreneurial Career based on the extrinsic occupational reward of profit.*

Personality Traits (Five-Factor Model) and Their Relationship to Preference for an Entrepreneurial Career Based on Intrinsic Work Rewards

As a basis for this study, attitudes about intrinsic work-related outcomes, which may be driven by psychological dimensions (Judge, Higgins, Thoresen, & Barrick, 1999), are proposed to influence, significantly, entrepreneurial career preferences. The Five-Factor Model of Personality is a descriptive representation (typology) of the five major dispositional dimensions that encompass human personality. Personality researchers since Allport (1937) have maintained that individuals seek out situations that correspond with their personalities, and empirical research supports this contention (Judge & Cable, 1997). Consequently, the argument for any of the Five-Factor personality dimensions to predict preference for an entrepreneurial career is based upon the

correspondence of the characteristics of the intrinsic work-related rewards being considered to the characteristics of the personality dimensions that may be detected within the individual. Since personality dimensions have previously been used to predict the attitudes and behavior of humans (Barrick & Mount, 1991), it should be possible to forecast how they may contribute to individual preference for an entrepreneurial career.

Conscientiousness

Conscientiousness is comprised of three main lower-order facets (achievement orientation, dependability, and orderliness) and is indicative of persistence, responsibility, and self-control (Judge, Higgins, Thoresen, & Barrick, 1999). Therefore, it follows that individuals who are highly conscientious may be attracted to entrepreneurship based on the intrinsic reward of independence. In short, due to heightened performance abilities and tendencies for self-control, Conscientious individuals are likely competent and confident enough not to require, or desire, constant supervision.

In addition to being good performers, Conscientious individuals are also cautious and risk averse (Goldberg, 1990). Hence, conscientious individuals may be attracted to occupations that require prudent, detail-oriented individuals. It has been shown that prospective entrepreneurs attempt to mitigate the riskiness of new enterprises by business planning, market analysis, and meticulously estimating potential profits (Gatewood, Shaver, & Gartner, 1995), among other things. Since these tasks can be categorized as challenging and non-routine, Conscientious individuals may be attracted to an entrepreneurial occupation based on the reward of a satisfying way of life. As such, it is the desire and ability to perform these types of complex analyses accurately that is expected to have a positive influence on the decision to pursue entrepreneurship as a primary vocational occupation. Thus,

Hypothesis 2: *Conscientiousness is positively related to the Preference for an Entrepreneurial Career based on the intrinsic occupational reward perceptions of (a) Independence and (b) a Satisfying Way of Life.*

Agreeableness

Agreeable individuals are warm, generous, trusting, and selfless (Costa & McCrae, 1992b) people who place a premium on sociable interaction as a way of life (McManus & Kelly, 1999). This tendency manifests itself as a desire to cooperate, seek consensus and conformity, and to avoid conflict (Judge & Cable, 1997). As such, high agreeableness is associated with passivity, dependence, and tradition (Costa & McCrae, 1992b; Goldberg, 1992). Therefore, it follows that agreeable individuals may not be attracted to an entrepreneurial career based on the rewards of independence or a satisfying way of life. Since tradition and conformity is suggestive of a lifestyle that respects conventional routines (Costa & McCrae, 1992b), there is inadequate conceptual bases

from which to argue that Agreeable individuals might appreciate the reward of a satisfying way of life. Further, entrepreneurs are taken to be unconventional, risk takers (Begley & Boyd, 1987a; Chen, Greene, & Crick, 1998) who assertively use their abilities to pursue market opportunities that others either don't notice or choose to ignore (Kirzner, 1973; Chandler & Jansen, 1992). Because agreeable individuals are highly likely to reject the type of autonomous initiative that this market function suggests, it is also just as highly likely that they may be repelled by an entrepreneurial career based on the intrinsic reward of independence. Thus,

Hypothesis 3: *Agreeableness is negatively related to the Preference for an Entrepreneurial Career based on the intrinsic occupational reward perceptions of (a) Independence and (b) a Satisfying Way of Life.*

Extraversion

Entrepreneurs must be energetic, outgoing, and sociable (extroversive) when they forecast venture performance to prospective investors in ambiguous situations (Knight, 1921) or recruit and manage support personnel to see their venture to fruition (Chandler & Jansen, 1992) as opposed to being shy, unassertive and withdrawn (introversive). It is this characteristic of social leadership that is most distinctive of Extraverts (Judge & Bono, 2000). Further, individuals who score high for Extraversion tend to be bold, forceful, and surgent (Goldberg, 1990), which is in line with most traditional descriptions of the outgoing demeanor of the entrepreneur (Sexton & Bowman, 1985). It is, therefore, conceivable that Extraverts may prefer an entrepreneurial career based on the reward of independence, which personifies autonomous, directive propensities.

In addition to the tendency to become social leaders, Extraverts are attracted to excitement and stimulation (Costa & McCrae, 1992b), which may be associated with the preference for an entrepreneurial career based on the reward of a satisfying way of life. Also, past research has demonstrated the Extraversion is strongly correlated with interest in enterprising occupations (Costa, McCrae, & Holland, 1984), such as entrepreneurship. Thus,

Hypothesis 4: *Extraversion is positively related to the Preference for an Entrepreneurial Career based on the intrinsic occupational reward perceptions of (a) Independence and (b) a Satisfying Way of Life.*

Neuroticism

Individuals who score high on Neuroticism lack self-confidence and self-esteem (Costa, McCrae, & Dye, 1991). As such, it is a personality dimension that is wholly opposite to the orientation of entrepreneurs, as confidence has been argued to be a core characteristic (Knight, 1921). Neurotic individuals are prone to anxiety, making those high on it fearful of novel situations

and susceptible to feelings of helplessness (Wiggins, 1996). The vocation of entrepreneurship requires individuals to develop the independent ability to seek innovative opportunities in the environment and develop them for personal gain (Kirzner, 1973), which is distinctive in society. Part of this ability requires prospective entrepreneurs to venture into unknown territory by taking calculated risks, making decisions under ambiguous circumstances, and adapting to a changing state of affairs (Chandler & Jansen, 1992; Chen, Greene, & Crick, 1998). As such, it is not likely that highly neurotic individuals will develop an attraction for entrepreneurial work based on the rewards of independence or a satisfying way of life. Thus,

Hypothesis 5: *Neuroticism is negatively related to the Preference for an Entrepreneurial Career based on the intrinsic occupational reward perceptions of (a) Independence and (b) a Satisfying Way of Life.*

Openness To Experience

Openness to Experience is expected to be a valid differentiator of entrepreneurs from others. This dimension assesses personal characteristics such as curiosity, broadmindedness, intelligence (Judge & Cable, 1997) and independence of thought (Costa & McCrae, 1992b), which are reflected in an entrepreneur's venturesome spirit (Knight, 1921). Further, Open individuals are willing to entertain novel ideas and unconventional values (Costa & McCrae, 1992b) and may desire situations that are challenging in order to stimulate creativity. Because Open individuals are also nonconforming and autonomous (Goldberg, 1990), they should be less attracted to traditional employee roles and conventional organizational careers. Thus, it is likely that Open individuals will be attracted to entrepreneurial vocations more strongly than others based on the rewards of independence and a satisfying way of life. Thus,

Hypothesis 6: *Openness to Experience is positively related to the Preference for an Entrepreneurial Career based on the intrinsic occupational reward perceptions of (a) Independence and (b) a Satisfying Way of Life.*

METHODOLOGY

Sample Description and Data Collection

Krueger, Reilly, & Carsrud (2000) find that studies comprising samples of upper-division college students can uncover occupational inclinations at a time when respondents are wrestling with important career decisions. Such samples undoubtedly include subjects with a wide range of intentions and attitudes toward entrepreneurship. Due to the sensitivity of intentional processes to initial conditions (Kim & Hunter, 1993), it is important for researchers to study the onset of

entrepreneurial phenomena before they occur. More precisely, study samples should include individuals who have not yet made a conscious decision to initiate new ventures. The sampling of only successful, current, or openly prospective entrepreneurs (e.g., college students majoring in entrepreneurship) introduces biases that subjugate data unpredictably, especially for rare phenomena (Krueger, Reilly, & Carsrud, 2000). While the exact details of a business may have not yet come together in the minds of most general upper-level college students, global career intentions should have (Scherer, Adams, Carley, & Weibe, 1989). Therefore, it is acceptable and appropriate to investigate entrepreneurial intent utilizing a sample of upper-level college students.

Approximately 404 students from a large southeastern university participated in this study on a voluntary basis utilizing an online, self-report data collection methodology. Subjects consisted of upper-level business undergraduates and Master of Business Administration (MBA) students in the concentrations of marketing, management, and accounting and professional-degree students from the College of Veterinary Medicine (CVM).

Upper-level undergraduate students in business, along with those pursuing the MBA, were appropriate primarily because their academic concentration implied that they had serious interest in pursuing a business career. Also, they were likely to offer a more informed range of interest in terms of business careers than students majoring in the sciences, liberal arts, humanities, or education. Since the intent to become an entrepreneur is a business career-related decision process, these upper-level business students offered a sample that was currently involved in such a process.

Veterinary students were appropriate for this study because the nature of their intended profession lends itself easily to the practice of entrepreneurship. In fact, the norm for success in the field of veterinary medicine is the ownership of a private practice. A recent report compiled by the three major veterinary associations in the United States demonstrates that of the approximately 64,000 veterinarians employed in the year 1997, 82% worked in private practice (Brown & Silverman, 1999). Thus, the tendency for veterinarians to become independent business owners is well established.

The procedure for garnering participation in the study was that of offering financial incentives coupled with unobtrusive cooperation. The researcher contacted students directly via mass targeted e-mail messages originating from the office of their academic major department. A website was developed so that the students could complete the survey on-line. In all scenarios, the students were informed that if they participated in the study, they were included in a sweepstakes drawing for a number of cash prizes. The chance of winning a prize at any level was approximately one in ten. Each questionnaire contained an informed consent statement along with sufficient contact information (e-mail and phone number) for the researcher to be able to inform students of their prize winnings. There was no personal identifying information gathered on the survey instrument itself. E-mail addresses were gathered on the survey only as an option for those students wanting to participate in the random cash drawing (100%). Each questionnaire was designed to collect data on all of the proposed variables in the research model.

After exclusion of subjects with duplicate submissions and those whose survey questionnaires were only partially completed, the final sample totaled 351 individuals. This sample was equally represented between the genders, consisting of 175 (49.8%) males and 176 (50.2%) females. Subjects were primarily graduating undergraduate business seniors (71.2%) and 21 to 23 years old (71.1%). In fact, there were more CVM students (16%) than MBA students (12.8%). The majority of subjects were Caucasian (White) (83.7%) with the next significant representation being Black (11.4%), which is in accordance with national population percentage demographics.

Measures

Five Factor Model of Personality.

Conscientiousness, Agreeableness, Extraversion, Neuroticism, and Openness to Experience was assessed with the 60-item measure of the NEO Five Factor Personality Inventory-Form S (NEO-FFI-S)(Costa, McCrae, & Dye, 1991). The NEO-FFI-S was developed to evaluate the five major dimensions of normal personality: Conscientiousness (C), Agreeableness (A), Extraversion (E), Neuroticism (N), and Openness (0). Participants respond to sixty items on a five-point Likert-type scale ranging from strongly disagree (0) to strongly agree (4). The NEO-FFI-S was developed as a short version of the NEO Personality Inventory (NEO-PI; Costa & McCrae, 1995) by selecting the twelve items from the longer listing with the highest positive or negative factor loadings on each of the five resultant factors. Cronbach's alpha reliability estimates of .81, .72, .77, .86, and .73 were reported for the C, A, E, N, and O scales, respectively, for a sample of 1,539 adults (Costa & McCrae, 1992a). Construct validity of the NEO-FFI-S is indicated by correlations with self-report adjective factors of the Five-Factor Model (see Costa & McCrae, 1992b). Internal consistency reliability for personality dimensions in this study was measured as .83, .72, .77, .83, and .73 for the C, A, E, N, and O scales, respectively, which is consistent with prior research (Defruyt & Mervielde, 1999).

Preference for an Entrepreneurial Career.

Preference for an entrepreneurial career is defined in this study as the attractiveness of the possible rewards of entrepreneurship and the magnitude of one's belief that these rewards can be obtained as an entrepreneur. As such, this multidimensional construct is represented by the extrinsic reward of profit, and the intrinsic rewards of independence and a satisfying way of life. These perceptions are envisioned within the valence model of the expectancy theory (Vroom, 1964; Mitchell, 1974), which has been validated for use to discern occupational preferences. It is a multiplicative function of the valence of entrepreneurial outcomes and the instrumentality that the occupational choice (entrepreneurship) will lead to second-level outcomes.

$$V_j = \sum_{k=1}^{n} (V_k I_{jk})$$

where

V_j = the valence of outcome *j* (occupation *j* is a first-level outcome);
I_{jk} = the perceived instrumentality of outcome *j* for the attainment of second-level outcome *k*;
V_k = valence of outcome *k.* This outcome, which is the result of obtaining first-level outcome *j*, is defined as a second-level outcome;
n = number of outcomes.

The three scales that represent the multidimensional construct were examined in a pilot study that was conducted prior to the main analysis. Since the scales were developed from new measures, there exist no historical reliability indices to report. However, the pilot study demonstrated that the Cronbach's alpha reliability estimates of .78, .76, and .83 were reported for the rewards of profit, independence, and a satisfying way of life, respectively, for an unrelated sample of 349 business school students.

Valence of Outcomes.

Second-level outcome valence is defined as the strength of the individual's affective orientation (positive or negative) toward the outcome (Mitchell, 1974). Using scaling procedures adapted from Teas (1981) and Bartol (1976), eleven potential rewards (second-level outcomes) of an entrepreneurial career were measured on a 5-point Likert scale ranging from extremely undesirable (-2) to extremely desirable (+2). The list of potential second-level outcomes was adapted from previous research (Teas, 1981; Bartol, 1976) and theory (Longenecker, Moore, & Petty, 2000).

Instrumentality.

Instrumentality pertains to the degree to which the occupational choice alternative is instrumental in leading to, or detracting from, a second-level outcome. According to Vroom (1964) this variable can range from fully negative to fully positive. Consequently, this variable was measured by eleven items on a 5-point Likert scale ranging from extremely unlikely (-2) to extremely likely (+2).

Demographic and Background Information.

Information pertaining to each respondent's age, gender, ethnicity, and class was obtained to use as control variables in the analysis. Each of these control variables was recorded as noncontinuous, categorical predictors.

ANALYSIS AND RESULTS

Correlation Matrix

An examination of the correlation matrix reveals that although some variables are significantly correlated, no correlation coefficient is greater than .371. A contribution to the construct validity of items in this study is that some of the measures are correlated significantly, but not highly enough to signify that any of them are measuring the same constructs (Nunnally & Bernstein, 1994).

Significant simple correlations demonstrated that Conscientiousness and Extraversion were positively, and Neuroticism was negatively, related to the intrinsic occupational reward perception of a Satisfying Way of Life. Furthermore, Conscientiousness was positively, and Neuroticism negatively, related to the extrinsic occupational reward of profit. Last, Conscientiousness, Extraversion, and Openness to Experience were positively correlated to the intrinsic occupational reward of independence.

Hierarchical Regression Analysis

Hierarchical regression was the principal technique of analysis used to assess the hypotheses in the investigation. All relevant variables were standardized prior to regression analyses. Cohen & Cohen (1983) suggest this method is most important when independent variables possess a theoretically based casual priority, as in this study.

The hierarchical regression procedure was used to test the research model in three separate phases (Table 1). The first phase concerned the relationship between the dimensions of the Five-Factor Model of personality and preference for an entrepreneurial career based on the extrinsic reward of profit. The second phase included the relationship between the dimensions of the Five-Factor Model of personality and preference for an entrepreneurial career based on the intrinsic reward of independence. The final phase specified the relationship between the dimensions of the Five-Factor Model of personality and preference for an entrepreneurial career based on the intrinsic reward of a satisfying way of life. In all phases, gender, race, class, and age were included as the first step in the procedure to control for any effects they may have had on the proposed relationships. Principally, it was expected that some of the Five-Factor personality dimensions would predict an individuals affection for the intrinsic occupational rewards of independence and a satisfying way of life and none would predict an individuals preference for the extrinsic reward of profit.

Table 1: Outline of Phases 1-3 of the Hierarchical Regression Analysis		
Regression	Dependent Variable	Independent Variables Entered
All Phases		
Step 1	Preference for an Entrepreneurial Career	Gender, Race, Class, Age
Phase 1		
Step 2	Preference for an Entrepreneurial Career (Profit)	CONSCI, AGREE, EXTRA NEURO, OPEN
Phase 2		
Step 2	Preference for an Entrepreneurial Career (Independence)	CONSCI, AGREE, EXTRA NEURO, OPEN
Phase 3		
Step 2	Preference for an Entrepreneurial Career (Satisfying Way of Life)	CONSCI, AGREE, EXTRA NEURO, OPEN
CONSCI (Conscientiousness) AGREE (Agreeableness) EXTRA (Extraversion); NEURO (Neuroticism) OPEN (Openness to Experience)		

Results of the Phase One Analysis

The result of the Phase One analysis is presented in Table 2. Hypothesis H1 predicted that none of the Five-Factor personality dimensions would predict preference for an entrepreneurial career based on the extrinsic occupational reward of profit. The hypothesis was tested in Phase One of the analysis using two steps. In step one, the control variables of gender, race, educational classification, and age were regressed on preference for an entrepreneurial career based on the reward of independence. As exhibited in Table 2, the F statistic of 0.952 was not significant indicating that gender, race, educational classification, and age do not have a significant relation to entrepreneurial career preference based on the reward of profit.

Next, the Five-Factor Model of Personality dimensions were added to the previous equation (step 2). Again, the resultant model was not significant ($F = 1.476$, $p > .05$) and produced no significant change in R^2 (change in $R^2 = .27$, $p. > .05$). These results provide support for H1 by demonstrating that personality dimensions have no relation to an individual's preference for the extrinsic reward of profit.

Table 2: Phase One Analysis

Regression	Dependent Variable	Independent Variables	Beta (Standardized)	F	R^2	R^2 (Change)	Partial F
Step 1	Preference for an Entrepreneurial Career (Profit)			0.952	.011	.011	0.952
		Gender	.055				
		Race	(.026)				
		Class	(.014)				
		Age	(.079)				
Step 2	Preference for an Entrepreneurial Career (Profit)			1.476	.037	.027	1.885
		CONSCI	.067				
		AGREE	.017				
		EXTRA	.036				
		NEURO	(.091)				
		OPEN	(.072)				

N = 351
* p < .05
** p < .01
*** p < .001
( ) Negative relationships

CONSCI - Conscientiousness
AGREE - Agreeableness
EXTRA - Extraversion
NEURO- Neuroticism
OPEN - Openness to Experience

Results of the Phase Two Analysis

The result of the Phase Two analysis is presented in Table 3. Hypotheses H2(a), H4(a), and H6(a) predicted that Conscientiousness, Extraversion, and Openness to experience are positively and significantly associated with the preference for an entrepreneurial career based on the reward of independence. Specifically, the more that an individual is reliable, assertive and focused, and open to learn new things, the more he or she may prefer an entrepreneurial career based on the autonomy that it offers. Conversely, hypotheses H3(a) and H5(a) suggest that agreeable and neurotic individuals will be negatively associated with the preference for an entrepreneurial career based on the reward of independence. In other words, poorly emotionally adjusted and traditional individuals will not desire entrepreneurial careers because they are expected to be repelled at the idea of working independent of authority. These hypotheses were tested in Phase Two of the analysis using two steps. In step one, the control variables of gender, race, educational classification, and age were regressed on preference for an entrepreneurial career based on the reward of independence. As exhibited in Table 3 the F statistic of 1.138 was not significant indicating that gender, race,

educational classification, and age do not have a significant relation to entrepreneurial career preference based on the reward of independence.

Next, the Five-Factor Model of personality dimensions were added to the previous equation (step 2). The model was significant ($F = 2.989$, $p < .01$) and produced a significant change in R^2 (change in $R^2 = .06$, $p. < .001$). Results provide support for the proposed positive relation between Conscientiousness and preference for an entrepreneurial career based on the reward of independence (beta = .178; $p < .01$)(H2(a)). Results also supported the positive relationship between Openness to Experience and preference for an entrepreneurial career based on the reward of independence (beta = .125; $p < .05$) (H6(a)). However, the hypothesized positive relation between Extraversion (beta = .063; $p > .05$) and preference for an entrepreneurial career based on the reward of independence was not supported (H4(a)). Neither were the proposed negative relationships involving Agreeableness (beta = -.088; $p > .05$)(H3(a)) nor Neuroticism (beta = -.020; $p > .05$)(H5(a)) with entrepreneurial career preference (independence).

Table 3: Phase Two Analysis

Regression	Dependent Variable	Independent Variables	Beta (Standardized)	F	R^2	R^2 (Change)	Partial F
Step 1	Preference for an Entrepren-eurial Career (Independence)	Gender	(.096)	1.138	.013	.013	1.138
		Race	(.016)				
		Class	(.027)				
		Age	.039				
Step 2	Preference for an Entrepreneurial Career (Independence)			2.989**	.073	.060	.426***
		CONSCI	.178**				
		AGREE	(.088)				
		EXTRA	.063				
		NEURO	(.020)				
		OPEN	.125*				

N = 351
* p < .05
** p < .01
*** p < .001
( ) Negative relationships

CONSCI - Conscientiousness
AGREE - Agreeableness
EXTRA - Extraversion
NEURO- Neuroticism
OPEN - Openness to Experience

Overall, the results of Phase Two tests indicated that individuals who are highly reliable performers (Conscientious) and those who appreciate new experiences (Open) are attracted to entrepreneurship as a plausible career choice because they, most likely, don't want to be bound by the limitations imposed on them while working in subordinate occupations. It is possible that Conscientious individuals don't believe that they need supervising and Open individuals probably

prefer to be free to make their own decisions, including making potential mistakes, as part of the learning process.

Results of the Phase Three Analysis

The results of the Phase Three analysis are presented in Table 4. Hypotheses H2(b), H4(b), and H6(b) suggested that Conscientiousness, Extraversion, and Openness to Experience are positively and significantly associated with the preference for an entrepreneurial career based on the reward of a satisfying way of life. Specifically, the more that an individual is a reliable performer, assertive and focused, and open to learn new things, the more he or she will prefer an entrepreneurial career based on his or her perception of the exciting, challenging, and non-repetitive lifestyle that it promises. Conversely, hypotheses H3(b) and H5(b) suggests that Agreeable and Neurotic individuals will be negatively associated with the preference for an entrepreneurial career based on the reward of a satisfying way of life. In other words, individuals with Neurotic tendencies and those who would rather conform to tradition instead of doing something more creative (Agreeable) will not prefer an entrepreneurial career because they are possibly not well-suited for the originality (Kirzner, 1973) or innovativeness (Schumpeter, 1934) required of entrepreneurs.

The hypotheses were tested in Phase Three of the analysis utilizing two steps. In step one, the control variables of gender, race, educational classification, and age were regressed on preference for an entrepreneurial career based on the reward of a satisfying way of life. As exhibited in Table 4, the F statistic of .471 was not significant indicating that gender, race, educational classification, and age do not have a significant relation to entrepreneurial career preference based on the reward of a satisfying way of life.

Next, all of the Five-Factor Model of personality dimensions were added to the previous equation (step 2). Although the model was highly significant ($F = 3.493$, $p < .001$) and produced a significant change in R^2 (change in $R^2 = .079$, $p. < .001$), the results only provide support for the proposed positive relation between Conscientiousness and preference for an entrepreneurial career based on the reward of a satisfying way of life (beta = .198; $p < .001$)(H2(b)). The results do not support the proposed positive relationships between Extraversion (beta = .049; $p > .05$) (H4(b)) or Openness to Experience (beta = .084; $p > .05$) (H6(b)) and preference for an entrepreneurial career based on the reward of a satisfying way of life. Also, the hypothesized negative relationships between Agreeableness (beta = .014; $p > .05$)(H3(b)) and Neuroticism (beta = -.090; $p > .05$)(H5(b)) and preference for an entrepreneurial career based on the reward of a satisfying way of life were, similarly, not supported.

Overall, the results of Phase Three tests indicated that individuals who are highly Conscientious are attracted to entrepreneurship as a probable career choice because of the perceived exciting and challenging lifestyle. Since Conscientious individuals are strong performers, they would likely be discouraged performing remedial or monotonous day-to-day tasks.

Table 4: Phase Three Analysis

Regression	Dependent Variable	Independent Variables	Beta (Standardized)	F	R^2	R^2 (Change)	Partial F
Step 1	Preference for an Entrepreneurial Career (Satisfying Way of Life)			.471	.005	.005	.471
		Gender	.026				
		Race	.008				
		Class	.056				
		Age	(.041)				
Step 2	Entrepreneurial Career (Satisfying Way of Life)			3.493***	.084	.079	5.885***
		CONSCI	.198***				
		AGREE	.014				
		EXTRA	.049				
		NEURO	(.090)				
		OPEN	.084				

N = 351
* p < .05
** p < .01
*** p < .001
( ) Negative relationships

CONSCI - Conscientiousness
AGREE - Agreeableness
EXTRA - Extraversion
NEURO - Neuroticism
OPEN - Openness to Experience

DISCUSSION

In summary, the current research examined the association of personality dimensions (as embedded in the Five-Factor Model of personality) to preference for an entrepreneurial career based on intrinsic and extrinsic occupational rewards. As stated in hypothesis 1, it was expected that there would be no relation between an individual's personality dimensions and affection for the extrinsic reward of entrepreneurial profit. In fact, there was no justifying literature that would convince one to forecast this relationship. So, it is not surprising that no relationship was found.

In hypothesis 2, it was anticipated that Conscientiousness would be positively associated with preference for an entrepreneurial career (based on (1) the reward of independence and (2) the reward of a satisfying way of life) and (3) entrepreneurial intentions (direct effect). Basically, it was posited that individuals who are reliable, achievement oriented, purposeful, and strong-willed (Conscientious), would be more likely to prefer an entrepreneurial career, for the autonomy (independence) and challenge (satisfying lifestyle) that entrepreneurship offers. Both of the proposed relationships to the entrepreneurial career preference considerations (H2a-b)) were supported in this study.

There exist a few previous empirical inquiries that might shed some insight on the observed relationships. Judge & Cable (1997) demonstrated that Conscientiousness is negatively related to team-oriented work cultures. As such, the researchers determined that Conscientious people prefer individualism as opposed to collectivism. Hence, it follows that the current study would find that Conscientiousness is positively related to preference for an entrepreneurial career based on the reward of independence. Since Conscientious individuals value high achievement, reliability, and order (Costa & McCrae, 1992b), it appears that they would rather not have their performance diminished by forced reliance on others. Consequently, the idea of a vocation, like entrepreneurship, where Conscientious individuals can excel independent of, or at least in control of, others is appealing to them and is consistent with the findings of Judge & Cable (1997).

This study also found a significant relationship between Conscientiousness and preference for an entrepreneurial career based on the reward of a satisfying way of life. More specifically, the study found that Conscientious individuals are more likely to prefer entrepreneurial occupations because they value professional lifestyles of excitement, challenge, and stimulation as opposed to remediation, monotony, and boredom (Costa & McCrae, 1992b). This finding is similar to that found in Judge, Higgins, Thoresen, & Barrick (1999), which demonstrated that Conscientiousness was able to predict intrinsic job satisfaction, a construct similar in some characteristics to entrepreneurial preference based on the reward of a satisfying way of life. In their study, the observed positive effect of Conscientiousness on intrinsic job satisfaction was significant even after the investigators controlled for the contribution of general mental ability, another performance predictor. The researchers concluded that knowledge about one's personality proved to be an effective predictor about subjective and objective career success (Judge, Higgins, Thoresen, & Barrick, 1999). All things considered, it is apparent that Conscientious people are attracted to livelihoods that offer them opportunities to test their abilities and confront their limitations.

Based on hypothesis 3, it was predicted that Agreeableness would be negatively associated with preference for an entrepreneurial career (based on (a) the rewards of independence and (b) a satisfying way of life). That is, it was expected that individuals who are highly trusting and dependent (Agreeable) would be repelled by the task requirements involving personal challenge, forcefulness, and independent activity that entrepreneurs must execute in the course of founding and developing new ventures (Chandler & Jansen, 1992).

The results of the current study did not support the envisioned negative associations between Agreeableness and preference for an entrepreneurial career based on the reward of independence (H3(a)) or the reward of a satisfying way of life (H3(b)). A possible explanation for this finding might be since Agreeable individuals value support, cooperation, and conflict avoidance whenever possible (Costa & McCrae, 1992b), they may be unconcerned with the expected rewards related to entrepreneurial careers. Being that they might not want to be viewed as untraditional, it is wholly plausible that highly Agreeable individuals may be fundamentally repulsed by the idea of entrepreneurship as a career option so they do not bother to form opinions about the specifics of the

vocation at all. This is consistent with the findings of Judge & Cable (1997). The researchers found that job seekers who scored high on the dimension of Agreeableness were significantly less attracted to aggressive, outcome-oriented, and decisive organizational environments. Since entrepreneurial careers have been described as requiring achievement oriented (McClelland, 1961), independent thinking (Kirzner, 1973), self-starters (Knight, 1921), it is a reasonable suggestion that highly conforming (Agreeable) individuals may not significantly consider the rewards of a vocation that they find distasteful.

According to hypotheses 4 and 5, it was anticipated that there would be significant associations for extraversion (positive associations) and neuroticism (negative associations) with entrepreneurial career preferences based on intrinsic entrepreneurial work rewards. However, none of the hypothesized relationships were supported in this study.

The fact that there were no significant findings between Extraversion and any other study variables was unanticipated. However, these non-findings are not unique due to the inconsistent evidence involving Extraversion and occupational variables in previous research. While Extraversion has been strongly correlated with interest in enterprising occupations (Costa, McCrae, & Holland, 1984), some researchers have noted (after regression analysis) that Extraversion displays no significance for favoring enterprising jobs (Judge, Higgins, Thoresen, & Barrick, 1999) like that of entrepreneurship. Accordingly, both of these previous findings are consistent with the results in this study. In the current examination, Extraversion was highly correlated with entrepreneurial career preferences based on independence and a satisfying way of life. However, regression analysis demonstrated that the dimension is not significantly related to preference for an entrepreneurial career based on either of the intrinsic entrepreneurial career rewards. Thus, the results of this study are consistent with previous findings.

Similar to Extraversion, Neuroticism also was not found to hold any significant relation to any of the variables of interest in this study. Neuroticism was expected to relate negatively to entrepreneurial career preferences based on the rewards of independence (H5(a)) and a satisfying way of life (H5(b)). It was predicted that since Neurotic individuals are anxiety-driven, fearful of novel situations, and vulnerable to feelings of helplessness (Wiggins, 1996), they would neither value the independence nor the challenge of an entrepreneurial career and, thus, refrain from forming entrepreneurial career preferences. While Neuroticism has been termed the most pervasive domain of all personality scales (Costa and McCrae, 1992b: page 14), it has failed to register significance for occupational preferences in previous studies (De Fruyt & Mervielde, 1999; Judge, Higgins, Thoresen, & Barrick, 1999).

Since both Extraversion and Neuroticism have failed to significantly explain vocational preferences and attraction for differing types of occupational environments in past research, the findings of nonsignificance in this study are not inconsistent. However, correlational support for Extraversion's positive relation to preference for an entrepreneurial career based on the rewards of independence (H4(a)) and a satisfying way of life (H4(b)); and, Neuroticism's negative relation to

entrepreneurial career preference based on the reward of a satisfying way of life, does offer hope that these associations will be corroborated in future research.

In hypothesis 6, it was posited that Openness to Experience would prove to be a valid predictor of preference for an entrepreneurial career (based on the rewards of (a) independence and (b) a satisfying way of life). In fact, it was suggested that this personality dimension might, possibly, be the most significant predictor of entrepreneurial career preference. Principally, it was predicted that individuals who are willing to entertain novel ideas and unconventional values (Costa & McCrae, 1992a), nonconforming and autonomous (Goldberg, 1990), inquisitive, open-minded, and intelligent (Judge & Cable, 1997) would appreciate the intrinsic rewards of an entrepreneurial career significantly more than others. The findings of this study affirm the hypothesis that Open individuals significantly value the entrepreneurial career reward of independence, resulting in a preference for an entrepreneurial career. Not supported in this study was the projected positive relation of Openness to Experience to preference for an entrepreneurial career based on a satisfying way of life.

The fact that Open individuals were attracted to an entrepreneurial career because of the perceived independence that the vocation of entrepreneurship affords is consistent with prior research. Judge, Higgins, Thoresen, & Barrick, (1999) empirically determined that Open individuals are negatively related to conventional occupations. As such, it appears that an Open individual's abhorrence of conformity and desire for self-reliance makes him or her an ideal match for autonomous entrepreneurial work (Knight, 2001; Kirzner, 1973). In addition, the finding that Openness is positively and directly related to entrepreneurial intentions affirms several previous investigations. Judge and Cable (1997) found that Open individuals are strongly attracted to innovative and detail oriented organizational cultures. Since entrepreneurial occupations revolve around innovative (Schumpeter, 1934) and detail-oriented (Gatewood, Shaver, & Gartner, 1995) activity, the findings of the current study are consistent. Further, Openness to Experience has been found to significantly predict whether, or not, individuals choose to become employed in enterprising occupations (De Fruyt & Mervielde, 1999) like entrepreneurship. Taken together, these studies provide additional support for the results of the current examination.

The lack of a significant relation between Openness to Experience and the preference for an entrepreneurial career based on the reward of a satisfying way of life is curious. The reward of a satisfying way of life was described in this study as freedom from a non-challenging, routine, and boring occupational lifestyle (Longenecker, Moore, & Petty, 2000). Since Open individuals are known for independence of thought, intellect, curiosity, and creativity (Costa & McCrae, 1992b; Judge & Cable, 1997), it was expected that the challenge and excitement of an entrepreneurial career would be appealing. However, this expectation was not affirmed. A possible explanation for this finding may exist in the possible perception that Open individuals may hold concerning their assessment of the reward of a satisfying way of life. Since there exists many other occupations, in addition to entrepreneurship, that consist of challenging and non-routine job characteristics, it is

possible that a career that assures a satisfying way of life is too conventional (common) to appeal, in particular, to, highly unconventional (Costa & McCrae, 1992b), Open individuals. In other words, there is nothing unique, in itself, about a career that may be considered exciting and challenging. Since Open individuals are attracted to uncommon work situations as opposed to the ordinary (Judge & Cable, 1997), it is feasible that people who score high for Openness to Experience may not be swayed to prefer entrepreneurial careers based, solely, on the reward of a satisfying way of life. Further research is warranted to determine if this variable serves as a mediator of some other relationship.

CONCLUSION

The results of the current study provide practitioners, such as entrepreneurs, vocational educators, and public policy administrators, a number of practical implications that may assist in the expansion of the entrepreneurship agenda. By discerning how entrepreneurial career preferences are formed, policy makers may be able to form programs that take advantage of robust interest in entrepreneurial rewards to help promote new business creation initiatives.

The current study demonstrated that the value that people designate to these potential rewards was shown to be strongly influence by some of their personality dimensions. Better education to enhance knowledge about the likelihood of realistically attaining these rewards should provide valuable perspective from which to form career-related judgments. Essentially, the more that people understand that entrepreneurial work requires long hours and dedicated effort (Chandler & Jansen, 1992) instead of focusing, solely, on potential rewards and accolades should help to decrease the notoriously high failure rates of new ventures (Cromie, 1994) that are initiated by unsuspecting entrepreneur novices. For example, the results suggest that people who Conscientious and Open to Experience may attracted to the independence and challenges that are an entrepreneurial reality. Therefore, any entrepreneurial training that Conscientious or Open individuals receive should include in-depth analyses about which rewards may reasonably be attained and in what timeframes for particular types of businesses. In this manner, prospective entrepreneurs can develop realistic business plans based on pragmatic working lifestyles and realistic compensation expectations.

These indications suggest that one way to identify people who are compatible, and those who are incompatible, with the prospect of becoming entrepreneurs is to locate individuals who are open and conscientious. It is suspected that some may doubt the practical feasibility of utilizing personality tests to discriminate between potential, and improbable, entrepreneurs. This reservation is particularly understandable when one reasons that much of the past entrepreneurship research failed to find consistent relationships between personality and behavior (Gartner, 1988; Shaver & Scott, 1991; Ripsas, 1998). However, the results of this study may provide some new insights for the development of inventive approaches to vocational counseling. Given that personality

dimensions are related to entrepreneurial career preference and potential entrepreneurial behavior, efforts in this direction are warranted.

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URBAN vs. RURAL: HUMAN RESOURCE MANAGEMENT IN SMEs

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ABSTRACT

Human resource management (HRM) practices, support systems and personnel profiles were examined in urban and rural enterprises. The investigation is an exploratory descriptive study employing a discussion of the results of a questionnaire. The authors' hypotheses are that urban and rural small and medium sized enterprises (SMEs) would differ significantly in HRM practices, support systems, and personnel profiles. Data were analyzed using t-tests and chi-square tests, as appropriate, to detect statistically significant differences between urban and rural SMEs. No interventions were performed; data were self-reported responses to questions on a survey instrument. The research findings suggest the authors' hypotheses are generally incorrect. The results from the study may advance the concept that technology and information availability have developed equity in HRM activities and functions in both urban and rural enterprises. Moreover, rural firms are performing at a higher level of sophistication and experience in HRM practices, support systems and personnel profiles.

INTRODUCTION

The research study was developed to determine whether rural businesses, with smaller employee labor pools from which to recruit, use the same human resource management (HRM) functions and have a comparable amount of expertise to attract the necessary numbers of appropriately skilled prospective employees. The investigators will illustrate the current state of HRM practices, support systems, and personnel profiles in firms that typify the urban and rural American business climate. Webster (1979) defines urban as "characteristics of the city or constituting a city," while explaining rural as "of, like, or living in the country." This investigation begins with the question, "what is the state of HRM in rural America?" To further the goals of discovering differences between urban and rural enterprises, the investigation will include only small and medium sized enterprises (SMEs) to remove the effects which may be distorted by the inclusion of larger organizations. SMEs (small enterprises are defined as 0-49 employees and

medium enterprises 50-250 employees for this study) have been recognized as forming an important component of our modern knowledge-based economies, but are different from large enterprises in many aspects (De Kok, 2003). It is the authors' contention that urban and rural firms are different in their HRM practices, support systems, and personnel profiles. This research instrument is the first step in the identification of human resource factors in urban and rural America in order to develop a collaboration of information for practicing managers.

Research on HRM and performance illustrates that HRM practices can impact performance, which further strengthens the need for HRM investigation (Boselie, 2002; Boselie, Paauwe & Jansen, 2001). Due to a number of trends (e.g., layoffs) and occurrences (e.g., threats of terrorism in larger cities) that have encouraged individuals to both leave urban areas and to begin their own businesses, it is somewhat discouraging and problematic to discover the dearth of research concerning HRM practices in rural organizations. Further, information regarding these same practices in SMEs are unclear (Heneman, 2000). This investigation of HRM personnel and practices in urban and rural enterprises proceeds as follows: the literature review; methodology; results; discussion; implications, limitations and future research directions; and conclusion.

LITERATURE REVIEW

An estimated one-fourth (22.5 percent) of the United States population lives in rural areas, defined as all places outside of metropolitan statistical areas (Fratoe, 1993). Rural communities have been depicted by such ideals as independence, freedom, self-reliance and life style traits which typically characterize the individuals that reside in rural America [Office of Advocacy-U.S. Small Business Administration (OA-USSBA), 2001].

Small businesses are the primary core of economic activity in rural areas (OA-USSBA, 2001) while urban areas are typically composed of a more diverse core of micro, small, medium, and large organizations. Miller (1990) indicates that smaller firms contribute more to the labor markets in rural areas than in urban areas (Bruce, 2000). A larger labor force exists in urban areas (Henry & Drabenstott, 1996), which provides a competitive advantage to firms that reside in these areas, while small businesses tended to cite labor force problems as a disadvantage due to their rural location (Strong, Del Grosso, Burwick, Jethwani & Ponza, 2005).

It would appear that rural areas suffer serious deficiencies in individual human resource capacity (human capital) compared to their urban counterparts. Additionally, educational attainment rates remain lower, dropout rates are higher, schools are chronically under funded, and training in entrepreneurship or other business subjects is limited in rural communities (Fratoe, 1993). Many businesses and individuals located in rural settings are significantly disadvantaged in terms of their access to and use of suitable training. (Bennett & Errington, 1995).

A review of human resource management related literature for the past twenty years indicates that some scholars realize the importance of the role of HRM practices in SMEs (Deshpande &

Golhar, 1994; Heneman, 2000; Hornsby & Kuratko, 1990; Katz et al., 2000). Research findings have demonstrated that managers of small firms have ranked personnel management as the second most important management pursuit behind general management activities (Hornsby & Kuratko, 1990). A review of the literature indicates a substantial lack of information in a number of areas: the extent of the utilization of traditional human resource management functions; the level of support systems; and the education, experience and expertise of the employee(s) responsible for human resource actions in small and medium sized enterprises. Consequently, the goals of this study are (1) to identify the breadth that traditional human resource practices are currently being utilized by urban and rural SMEs; (2) to ascertain the support that urban and rural SMEs provide to HRM as reflected by the number of full and part-time employees assigned to human resource activities and by the use of support systems such as formal communication processes, management information systems (MIS), employee handbooks, and legal advice employed by the firms' HRM personnel; and (3) to survey the level of education and experience of the human resource workforce, and to establish the employees' self-perceived levels of expertise in selected human resource practices in urban and rural SMEs.

Researchers have only recently initiated the examination of human resource management in SMEs. Empirical data has generally demonstrated that smaller organizations do not have formal HRM departments nor do they adopt traditional HRM paradigms or practices (Barron et al., 1987; De Kok & Uhlander, 2001; De Kok et al., 2003; Heneman & Berkley, 1999; Hornsby & Kuratko, 1990; Katz et al., 2000). Research to date has concentrated on SME determinants of HRM practices, such as firm size (De Kok & Uhlander, 2001; De Kok et al., 2003; Kotey and Slade, 2005; Ram, 1999), sector of the economy in which the firm competes (Curran et al., 1993; Mowday, 1998; Ram, 1999), business strategy employed (Lengnick-Hall & Lengnick-Hall, 1988; Schuler & Jackson, 1987; Youndt et al., 1996), family firm governance (Aldrich & Langton, 1997; Cyr et al., 2000; De Kok et al., 2003; Fiegener et al., 1996; Reid & Adams, 2001), performance and HRM practices (Barron et al., 1987; Boselie, 2002; Boselie et al., 2001; De Kok, 2003; Heneman & Berkley, 1999; Hornsby & Kuratko, 1990; Huselid et al., 1997; Kotey & Meredith, 1997; Management Services, 2001; McEvoy, 1984; Patton & Marlow, 2000; Zheng, 1999), recruitment (Aldrich & Langton, 1997; Carroll et al., 1999), training and development (Boocock et al., 1999; Carr, 1999; Hendry et al., 1991; Koch & McGrath, 1996; Marlow, 1998; The Nottinghamshire Research Observatory, July 2002; The Nottinghamshire Research Observatory, December 2002; Westhead & Storey, 1997; Westhead & Storey, 1999), performance appraisals (Jackson et al., 1989), specialists employed (Bacon et al., 1996; Heneman & Berkley, 1999; Jackson, et al., 1989; Wagner, 1997) and the development of a business plan (De Kok et al., 2003).

Despite these determinants as well as others, an escalating body of research findings would conclude that smaller organizations have less formal HRM practices, but variation among these practices is fairly dispersed (De Kok & Uhlander, 2001). Hill and Stewart (1999) demonstrated this variation by the different levels of the HRM taxonomy of practices and sophistication exhibited by

smaller firms. Hill and Stewart (1999) also suggest that smaller businesses need flexibility and less formality to compete in an environment of uncertainty. Hornsby and Kuratko (1990) discovered that HRM practices were more sophisticated than predicted among smaller organizations. Deshpande and Golhar (1994) illustrated that HRM practices in small manufacturing companies were as sophisticated as large organizations. Hendry, Jones, Arthur and Pettigrew (1991) purport that poor planning for the future or inadequate resources are the rationale for informal HRM practices.

A longitudinal study of Australian manufacturing SMEs administered by Jones (2001) depicted a positive correlation between SME growth and certain industrial relation components as well as HRM practices. Results of a survey conducted on HRM practices and policies in Northern Ireland demonstrates that SMEs are more likely to employ and retain younger individuals with few qualifications (University of Ulster International HRM Research Group [UUI], n.d.). The findings indicated training and development activities are vital for growth and sustainability in the market place (UUI, n.d.). Other research outcomes from the survey are as follows: recruitment/staffing and appraisal functions are highly developed; approximately half of the companies have dedicated HRM departments operated by the owner, managerial director, or a member of the board of directors; typically the HRM department employs one or two people; only one-third of the companies have a HRM plan; employee relations are exceptionally strong; training and development is one of the greatest challenges faced by SMEs; and, most firms are committed to employee development (UUI, n.d.).

Summarizing and providing generalizations of the prevailing research regarding HRM practices of small and medium sized enterprises is difficult. Information focused exclusively on HRM practices, support systems and personnel is severely deficient when evaluating urban and rural firms. Accordingly, the goal of this research investigation is to extend the knowledge about HRM by developing or confirming information related to HRM personnel, support systems and practices employed in urban and rural enterprises through information gathered from SMEs in those geographic area designations.

Research hypotheses

Regardless of the lack of research evidence to support the supposition of differences between urban and rural enterprises, arguments can be postulated for reasons why this may be the case. The reasons why significant differences in formal communication systems are expected is partly due to the fact that rural firms are located in less populated areas where employees are more likely to have known each other for longer periods of time and perhaps even be related to a number of people who live and work in the area. It is expected that these employees would be more likely to communicate informally rather than using formal communication systems. Variations in the utilization of MIS systems are expected to some degree because of the availability (or lack thereof) of personnel who have the expertise to design and operate such a system. The use of handbooks is consistent with a

more formalized communication system. It was anticipated that rural enterprises would have fewer or less formalized communications and that they would be less likely to make use of employee handbooks for presenting policies and procedures to their personnel. It is expected that employees in urban firms would be less committed to the enterprise and have fewer prior long-term relationships with employees. Thus it is likely that an employee in an urban firm might be more inclined to file a lawsuit whereas an employee in a rural firm would not due to familial and familiar relationships. These arguments lead to the first hypothesis:

Hypothesis 1: *Differences exist between urban and rural SMEs in the HRM support functions utilized.*

If rural firms operate on a more informal basis, it is likely that there will be differences in the number of personnel dedicated to HRM activities. Informality of operations may lead to one of two situations: the owner/manager performs the HRM functions as a part of the overall job; or, individuals perform HRM-related activities as skills and time allow. In either case, it is doubtful that a rural enterprise would have one or more full-time personnel dedicated to implementing the functions of HRM. It is more probable that HRM will be performed on a piecemeal basis. Thus, the second hypothesis is advanced:

Hypothesis 2: *Differences exist between urban and rural SMEs in the number of personnel dedicated to HRM activities.*

If rural personnel performing HRM activities are doing so in an ad hoc fashion, it is improbable that they will accumulate any substantial level of experience. Further, if the HRM activities are distributed among personnel or accomplished on a rotating basis, it is conceivable that there will be substantial differences in the amount of experience amassed by rural HRM personnel. Thus, the following hypothesis is put forward:

Hypothesis 3: *Differences exist between urban and rural SMEs in HRM experience of the primary HRM personnel.*

In order to receive a HRM-related degree, it is likely that travel and time away from home and the job will be required for rural personnel. It is implausible that an employer would dispatch one or more employees to obtain such a degree. It is more credible that an individual would have coincidentally received a degree related to HRM before moving to the rural area. Similarly for certificates, a rural employee is likely to be required to travel or engage in correspondence (or other long distance learning), in order to receive a certificate. In both education and certificate acquisition, urban employees are more inclined to have the opportunity as well as the support to pursue such

endeavors. It is suggested in the fourth hypothesis that these differences will be substantial between urban and rural HRM employees.

Hypothesis 4: Differences exist between urban and rural SMEs in HRM-relevant education and certificates obtained by the principal HRM personnel.

Formal schooling in HRM-related areas should increase perceptions of expertise. Since it is anticipated that rural HRM employees will have lower levels of formal education and certificates, it may also be presumed that perceptions of expertise will be lower in rural HRM employees. However, if there is no perceived need for formality in HRM practices, it is possible that there are fewer or less complicated HRM activities being performed in rural enterprises. It would not be unrealistic to assume that degrees of expertise would be reported at lower levels in rural firms. Thus, the fifth hypothesis is submitted:

Hypothesis 5: Differences exist between urban and rural SMEs in the perceptions of expertise reported by the organizations' primary HRM personnel.

METHOD

Design and Procedures

The research employed the use of a single administration of a survey. The data are self-reports of the participants' own perceptions and experience. The survey asked respondents to reply to questions about practices and functions, education and experience, and perceptions of expertise with regard to HRM in their organizations. These responses will be used to gain a better understanding of differences between urban and rural organizations on these inquiries.

The data for this paper were collected as a comprehensive research project of HRM practices in firms of various sizes in a 26-county area of the Texas Panhandle. A cover letter requested that the person responsible for HRM activity complete the instrument. The mailing list was provided by the local Better Business Bureau and included both members and non-members of the bureau. Criteria for this study were (a) 250 or fewer employees and (b) operational independence (independent firms are not components or extensions of larger organizations). There were 138 respondents that satisfied the established criteria for this study. Ninety-one were located in the urban area and 47 in the rural area.

Characteristics of the sample

A total of 64.6% of the participants identified their organizations as either retail (28.3%) or service businesses (36.2%). The remaining sample was 19.6% industrial, 9.4% health care, and 6.5%

financial services. Of the 138 respondents, 91 (65.9%) of the firms were located in the survey area's SMA (population 174,000) and 47 (34.1%) were in the surrounding rural area.

Measures

The questionnaire contained five major divisions: (a) the firm's demographic data, (b) HRM management employee demographics, (c) personal data about the primary HRM individual, (d) perceptions of HRM expertise by the principal HRM employee, and (e) HRM support processes. Demographic data included size as measured by the number of employees, type of business (e.g., retail, service), and whether the firm was independent or functioning as an extension of another organization.

Data were collected concerning each firm's use of management information systems (MIS), formal employee communication processes, use of employee handbooks, and the solicitation of legal advice. In addition, respondents were queried about the firm's time commitment of personnel to HRM activities. For the employees who perform part-time HRM functions, participants were requested to estimate the percentage of time allocated to HRM activities. In addition, the principal HRM employee was asked about his/her years of experience, education level, and whether he/she had any HRM certificates.

The principal HRM employee was requested to rate his/her level of expertise in 15 separate HRM areas such as strategic HRM planning, recruitment, job design, and employee relations. The range of expertise ratings was from 1 (very little expertise) to 5 (extensive expertise).

All data were analyzed using a t-test or a chi-square test, as appropriate, to determine statistically significant differences between HRM support activities, personnel, and perceptions of expertise in rural and urban small and medium sized enterprises. The results of the analysis are presented in the following section.

RESULTS

HRM support functions

Firms were asked the extent to which they used formal employee communication processes, MIS systems, employee handbooks, and outside legal advice. The findings are presented in Table 1.

There is a significant difference between rural and urban firms with respect to the use of handbooks and utilization of outside legal advice. Urban firms tended to use handbooks (58.0%) and seek legal advice (53.4%) more than rural firms (38.6% and 23.9%, respectively). There were no differences encountered in the use of formal employee communication activities or formal MIS systems when all firms were included in the analysis.

Table 1. Differences between Urban and Rural Enterprises on HRM Support Functions						
	Urban		Rural			
	Observed	Expected	Observed	Expected	c2	p
Formal communication system	50	46.8	21	24.2	1.393	.238
MIS system	56	52.9	24	27.1	1.319	.251
Employee handbook	51	45.3	17	22.7	4.383	.036
Outside legal advice	47	38.1	11	19.9	10.706	.001

HRM personnel dedicated to HRM activities

Respondents were queried about the deployment of full-time and part-time personnel to HRM functions. Also, the percent of work-time each week that part-time personnel devoted to HRM activities was requested. Table 2 presents the findings.

There was no variation noted between urban and rural organizations with regard to the number of full-time HRM personnel. Part-time employees of urban firms devote a larger percentage of their time per week to HRM activities (M = 19.2, SD = 16.7) than do those of rural firms (M = 10.6, SD = 10.1). There were no differences encountered in the number of full-time or part-time personnel when all firms were included in the analysis.

Table 2. HRM Employee Demographics							
	Urban			Rural			
	N	M	SD	N	M	SD	t
Full time employees devoted to HRM	87	0.43	0.58	44	0.48	0.63	-0.469
Part time employees devoted to HRM	84	1.29	1.37	41	0.88	1.65	1.462
Percent of part time employee's work time devoted to HRM	63	19.24	16.67	33	10.64	10.08	2.713***
*p < .10. **p < .05. ***p < .01							

Years of HRM experience

The person primarily responsible for HRM functions was asked to provide information about years of experience. There was no significant difference among primary HRM personnel in rural and urban firms (Table 3).

Table 3. Years of HRM Personnel Experience							
	Urban			Rural			
	N	M	SD	N	M	SD	t
Years of experience	84	15.08	11.61	44	18.59	12.51	-1.546

Level of HRM personnel education

The person primarily responsible for HRM functions was asked to provide information about college degrees and HRM certificates. There was no significant difference among primary HRM personnel in rural and urban firms (Table 4). The percentage of rural HRM personnel obtaining college degrees is 21.3% and 11.3% have HRM certificates, While 22.0% of urban HRM personnel have college degrees and 9.3% have HRM certificates.

Table 4. Level of HRM Personnel Education						
	Urban		Rural			
	Observed	Expected	Observed	Expected	c2	p
College Degree	29	19.8	10	10.2	0.009	.925
HRM Certificate	8	8.6	5	4.4	0.137	.711

Perceptions of expertise

HRM personnel were requested to rate their levels of expertise for a variety of HRM functions. Table 5 provides a list of the functions and the results of the self-ratings. There is no substantial variation in perceptions between rural and urban HRM personnel on any HRM function.

Table 5. HRM Personnel Perceptions of Expertise							
	Urban			Rural			
	N	M	SD	N	M	SD	t
Strategic HRM planning	85	2.19	1.18	44	2.30	1.17	-0.490
Recruiting	88	2.84	1.14	44	2.82	1.13	0.108
Selection	88	3.30	1.14	44	3.09	1.05	0.999
Orientation	88	3.22	1.21	44	2.95	1.10	1.207

Table 5. HRM Personnel Perceptions of Expertise							
	Urban			Rural			
	N	M	SD	N	M	SD	t
Employee training	88	3.51	1.13	45	3.49	1.10	0.109
Employee development	88	3.20	1.20	44	3.27	1.15	-0.313
Career development	88	2.85	1.26	43	2.70	1.19	0.670
Job design	87	3.07	1.25	44	3.05	1.26	0.101
Performance appraisals	87	3.28	1.27	44	3.25	1.24	0.112
Compensation	88	3.33	1.20	44	3.07	1.13	1.202
Employee benefits	88	3.34	1.26	43	3.07	1.35	1.102
Safety and health	88	3.36	1.19	44	3.32	1.18	0.209
Communications	88	3.61	1.13	44	3.39	1.10	1.106
Employee relations	88	3.65	1.14	43	3.63	1.16	0.093
Personnel records	88	3.36	1.31	43	3.28	1.26	0.350
*p < .10. **p < .05. ***p < .01							

DISCUSSION

HRM support functions

It was hypothesized that there would be differences between urban and rural firms in the use of formal communication processes, MIS systems, employee handbooks, and solicitation of outside legal advice

The authors expected that there would be significant differences in the use of formal communication systems between rural firms and urban firms. The reasons why significant differences were expected was partly due to the fact that rural firms are located in less populated areas where employees are more likely to have known each other for longer periods of time and perhaps even be related to a number of people who live and work in the area. It was anticipated that these employees would be more likely to correspond informally rather than using formal communication systems. However, these differences did not materialize. It seems that a large majority of firms realize the importance of careful documentation and the use of formal communications systems to correspond with their employees to prevent misunderstandings regardless of the community in which the company is located.

The authors suspected that employees in urban firms would feel less committed to the enterprise and have fewer prior long-term relationships with employees. Thus, it was postulated that an employee in an urban firm might be more inclined to file a lawsuit whereas an employee in a rural firm might be less inclined to file a lawsuit since they may be related to other employees in the firm or have known them since childhood. Additionally, an underlying rationale was the utilization of formal communication systems could be a means of documenting disclosure to provide proof of intent in the event a lawsuit was filed.

The authors anticipated that there would be significant variations in the use of MIS systems between rural firms and urban firms. A rationale of why the researchers did not discover any of the anticipated discrepancies may be due to the availability as well as access to robust software packages currently available that do not require specialized programming support. If access to such software is the reason for the findings of no significance, it is reasonable to assume that such software could be purchased as easily by rural enterprises as by urban enterprises through the Internet.

There are differences in the use of employee handbooks and the solicitation of legal advice. The utilization of employee handbooks and the solicitation of outside legal advice may represent the existence of a more litigious environment for urban firms. The discrepancies expected in the application of formal communication systems and MIS systems is not significant, although trends follow in the forecasted direction with a larger percentage of urban than rural firms reporting use of these systems. It is possible that the proliferation of standardized programs as well as increased intranet and internet usage has created increasingly similar internal operating environments for both urban and rural firms.

HRM personnel dedicated to HRM activities

The researchers envisioned that there would be differences in the use of full-time and part-time employees dedicated to HRM activities in urban and rural firms. A comparable number of full-time employees were reported by both urban and rural enterprises. However, a larger number of part-time HRM employees as well as a higher percentage of part-time employees' work hours were dedicated to HRM activities in urban enterprises. Several potential explanations exist for such a pattern. Employers could employ a larger number of part-time employees throughout the organization as a form of cost control (assuming that only full-time employees receive healthcare and other benefits). Moreover, employers in an urban area could require additional employee time for HRM activities because of the need to furnish HRM support similar to that provided by other employers in the same urban area. That is, employees in urban principalities may have higher expectations of more formalized HRM functions within the firm. This may require increased employee time for HRM activities than would be needed in a firm of comparable size located in a

rural region. In a rural area, many of the HRM functions may be more informal and provided as needed by individual employees.

Level of HRM personnel experience

Differences in HRM personnel experience were expected between urban and rural firm employees. Rural HRM personnel reported more years of experience than did urban HRM employees, although not enough to be statistically significant. It is likely that turnover in rural settings is relatively low and that many employees have chosen to remain in the town in which they were born and raised. Employees in urban areas may have similar amounts of HRM personnel experience but it may or may not be with the same firm. Employees in rural geographic areas appear to have most of their HRM personnel experience with the same firm or a limited number of firms.

Level of HRM personnel education

Variations in HRM education were contemplated between urban and rural firm employees. It was hypothesized that a higher percentage of urban HRM employees would have acquired relevant education and certificates than rural HRM employees. Approximately equal percentages of urban and rural HRM employees reported possessing a human resource management college degree. Currently in the area surveyed for this research project, the universities and community colleges do not offer specialized HRM-related degrees. Specialized training in preparation for HRM certification is available at one of the community colleges and HRM classes are offered at all higher education campuses in the survey geographic area. While HRM-related degrees are not currently available locally, certainly such degree programs could be accessed through online programs and from a wide variety of educational sources. When queried if the primary HRM person has any human resource management-related certificates, employees in both urban and rural reported similar levels of certificates.

Perceptions of expertise

Differences in perceptions of expertise were expected; few were realized. If experience levels, education levels, and certificate levels are similar for both urban and rural HRM personnel, it may be unrealistic to expect differences in perceptions of expertise. Urban HRM personnel report more expertise concerning pay and promotion, whereas rural HRM personnel have higher ratings of expertise on employee development. This is consistent with rural enterprises being more individually-focused and urban enterprises being more organizational-focused. Rural enterprises are concerned with the person, the individual, and his or her development, whereas urban organizations appear to have a greater emphasis on pay and advancement. Perhaps there is more opportunity for

advancement and greater resources (and competition) in urban organizations. For rural organizations, pay and promotions cannot be as easily offered; therefore, they must resort to other enticements, such as personal betterment.

IMPLICATIONS, LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

This research adds to the knowledge base in the field of HRM practices in rural and urban areas. Both urban and rural firms take actions regarding employees that are required to assist the firm's competitiveness. It appears that in rural firms, those actions are more employee-centered than policy-centered. That is, the rural firms are more likely to make adjustments as needed for individual employee situations. Firms in urban areas are more likely to use policy-centered approaches that are based on standardized policies and practices.

Employees in firms located in rural areas are likely to have longer tenure with one firm. There is a greater likelihood for employees to have stronger personal relationships with co-workers in rural areas and to pursue career growth by staying with one company for longer periods of time. This can be valuable to the employer because the labor pool from which they recruit is considerably smaller than urban areas.

This research contains some limitations. First, the information gathered for this project is self-reported data. It would be helpful in future inquiries to acquire data in addition to self-reported data. The size of the sample respondents in the study could have precluded the researchers from discovering differences because of the statistical power associated with a sample of this size. This issue could be addressed by developing a larger sample population in future studies.

It is recommended that this study be replicated in several other geographical regions with a rural/urban mix to determine if these findings are consistent across different regions. Additionally, future research could investigate the extent to which HRM practices do (or do not) influence a particular company's success. Finally, it is recommended that future investigations examine specific industries to determine if utilization of HRM varies by industry.

CONCLUSION

Urban and rural SMEs necessarily perform the same basic HRM practices and functions as large organizations. Moreover, they appear to have a surprisingly more sophisticated approach to HRM functions than has been previous speculated. Urban and rural enterprises had a greater number of employees performing HRM functions than one may have suspected. Further, there is a surprisingly large HRM experience tenure in both urban and rural organizations. Overall, this indicates a lack of HRM differentiation between urban and rural SMEs and points to a higher level of sophistication and experience than expected.

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DO MEN AND WOMEN ENTREPRENEURS DIFFER IN THEIR RELIANCE ON SOURCES OF INFORMATION IN OPPORTUNITY RECOGNITION IN TECHNICAL FIELDS?

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ABSTRACT

To date research into women entrepreneurs' opportunity recognition and firm formation, particularly in technology sectors, where women are underrepresented, is limited. A better understanding of how women entrepreneurs in technology sectors recognize opportunities and what influence that recognition has on firm formation may make it possible for more women to become successful entrepreneurs in technology sectors. This conceptual paper shows the ways in which women and men may differ in their perceptions of technology and identifies some of the differences in their reliance on sources of information. It proposes several research areas for future research.

INTRODUCTION

One of the most elusive topics in entrepreneurial research is to understand how opportunities are discovered and what the consequences are for firm formation (Shane & Venkataraman, 2000). Although considerable research has been done on opportunity recognition (Hills, Lumpkin & Singh, 1997; Singh, 2000; Shane, 2000; Baron, 2004), to date there is not much research on how men and women entrepreneurs in technology sectors recognize opportunities and form firms. While there is a strong research stream on the social, cultural influences and challenges faced by women in their careers, it has not been effectively linked to the literature on opportunity recognition and firm formation to help to understand what influence these factors have on the career trajectories of women with technical degrees.

In this paper, we summarize what is know to date about this important topic and propose a research agenda that would help improve our understanding of how women recognize opportunities and what are the factors that influence them in forming companies. This is an important topic as there is a good deal of concern about the technical and scientific workforce in the US and the recognition that women will need to play a more prominent role if the US is to maintain it leadership in high technology industries.

WOMEN IN TECHNOLOGY BASED FIRMS

The Proceedings of the Organization for Economic Cooperation and Development (OECD) (1998:156) have noted that to better understand the phenomenon of entrepreneurship, populations of women need to be included or studied separately in both academic and government investigations and this research must be grounded in theory. It is hoped that this will lead to a better understanding of the needs of women entrepreneurs, as well as identify areas where public policy could be beneficial. The OECD report also points to a need for more knowledge about technical industries and for surveys focusing on women entrepreneurs in these fields.

According to the National Women's Business Council, NWBC, (2003), there are an estimated 6.2 million privately-held women-owned firms in the U.S., accounting for 28% of all businesses. Businesses women own at least 50 percent of the company employ 19.2 million people and generate $2.5 trillion in annual revenues (NWBC, 2005). The NWBC (2003) reports that despite the fact that women entrepreneurs are entering technology sectors at a faster rate than ever before, the largest share of independent women owned ventures (as for men) is still in the service sector with 53% of firms in services, 16% of firms in retail trade and 9% in finance, insurance and real estate. Moreover, while there are more women with the proper education in technology fields, especially IT, who are starting new ventures, they are not doing so in the fields in which they are trained or developing businesses with high growth potential.

According to the Internet World magazine's annual report, men business owners still represent an overwhelming number of top slots among the top 50 Internet companies (48 men versus 2 women chief executives) (Lorek, 2000). To date, Weinstein (2001) reports that although women business owners are increasing in technology sectors they still represent a small minority in technology leadership roles. The National Science Foundation studies (NSF, 2002; NSF, 2003) indicate differences between men and women in technical fields with regard to self employment and education. NSF (2002, 2003) reporting that males with technical degrees are more likely than females with technical degrees to be in the labor force, employed full time and to have started new ventures. In particular, according to the NSF report (2002, 2003), women with technical degrees are less likely than men to start new ventures in technical fields.

For example, the NSF (2003) report indicates that among entrepreneurs with technical degrees, 75% of women and 24.3 % of males with technical degrees started ventures in non-technical fields whereas 35.1% of males and 2.9% of women with technical degrees started ventures in engineering and 24.7% of males and 12.6% of women with technical degrees started ventures in computer/math science. In sum, despite the fact that there are more women with proper education in technology fields they are not starting new ventures in the technical fields in which they are trained.

To date, most research on women entrepreneurs has focused on the factors influencing performance, profitability, survival and growth of employees and equity financing (Anna, Chandler,

Jansen & Mero, 1999; Greene, Brush, Hart & Saparito, 1999; Brush et al. 2001; Brush et al. 2002; Carter et al 2003). Studies of individual factors influencing performance are also prevalent (Anna, et al. 1999; Greene, Brush, Hart & Saparito, 2003); yet research on how individual factors influence women entrepreneurs' recognition of business opportunities is inconclusive due to the lack of comparative studies that control for industry sector and other factors (Brush & Hisrich, 2000).

To date most prior research sampled women from various industrial sectors as a homogeneous group (Brush & Hisrich, 1999; Brush & Hisrich, 2000; Mitchell & Weller, 2001). In fact, the respective environments of technical and non-technical sectors are different as technical environments are more complex, uncertain, and dynamic. The changing pattern of environmental factors creates waves of technological uncertainty stimulating entrepreneurial opportunities (Tushman & Anderson, 1986). Technological markets create great competitive intensity through rapid advances in technology and opportunity for the rapid creation and destruction of firms (Bourgeois, 1985; Bourgeois & Eisenhart, 1988).

In this paper we first review prior research on cultural differences between men and women in how they view technology and show that women and men may differ in their perception of technology. Then we focus on the sources of information in entrepreneurial opportunity recognition and suggest that women's under representation in technical fields may provide them with less exposure to the information in technical sectors that allows them to develop skills or confidence to handle the various level of technological complexity in the environment in their entrepreneurial pursuits. As a result, women and men entrepreneurs in technical sectors may differ in their reliance on certain sources of information in opportunity recognition and face obstacles to developing firms in those fields. We propose avenues for fruitful future research that may help to understand the important factors that influence opportunity recognition of women entrepreneurs in technology sectors.

The concepts presented here provide insights for the future entrepreneurship research and in advising women who are potential business owners in technology domains. It may also help in the development of training programs that will empower women and provide access to resources that could lead them to the recognition of entrepreneurial opportunities in technical sectors.

CULTURAL DIFFERENCES IN HOW MEN AND WOMEN VIEW TECHNOLOGY

There is an important dimension to opportunity recognition and firm formation that has received little attention in entrepreneurship studies but is well recognized in the disciplines of sociology and in the literature in gender studies, as well as in the popular press. Recently reported research on how men and women who have entered the fields of technology differ in their interests and perceptions has thrown new light on the cultural dimensions that may also play a major role in which opportunities women choose to pursue.

Margolis, Fisher and Miller (1999) studied gender difference in how computer science majors perceive the field. They found that the attraction to computers for males comes early in life and seems to be focused on the computer itself, as they find satisfaction in controlling and mastering a machine and enjoy hacking for hacking's sake. Females, by contrast, are more likely to place a high value on the context of computing, the links between computers and other fields, and the contribution to society that computers can make. The researchers suggest that these cultural differences in the way men and women students perceive computer science and the way it is taught in universities, with a focus on the narrow technical aspects of the discipline taught in the early years and applications and multidisciplinary projects deferred to the very end of academic programs, if they are present at all, is one reason that women have tended to eschew the field. Even when women complete degrees in computer science, they are less likely than men to be interested in accepting jobs where they are "narrowly focused" on technology.

Several studies have attempted to study women business owners in technical fields. Hill (2005) found that while women tend to report the need for challenging work and have the similar ambitions as their male IT worker counterparts, some aspects of their lives simply make achieving a balance and keeping up in the fast moving field, more difficult. Riemenschneider, Armstrong, Allen, & Reid (2004) found that women face more difficulties and barriers in technical fields compared to men. For male workers, the challenges inherent in technology jobs have basically one dimension. For women, however, the very job qualities that strong entrepreneurs in technology crave -- challenging projects and rapid, successive skill acquisition -- are causing even more stress. Women are forced to balance not only job and family, but also contradictions within their relationship to technology work itself. They too, like to keep their skills well-honed and take on interesting and high-profile projects. But those very characteristics of high demand technology jobs may be the ones that finally push them out of the field.

As cultural differences may pose an obstacle in women entrepreneurs' starting new ventures in technical sectors we suggest studying the differences between men and women entrepreneurs in their entrepreneurial opportunity recognition in technical sectors. Such a study will be helpful in our understanding of the women's firm formation in technical sectors.

THEORETICAL BACKGROUND

Opportunity recognition has long been regarded as a core attribute of entrepreneurship and an essential step in entrepreneurial ventures (Venkataraman, 1997; Kirzner, 1979). Opportunity recognition has been described as perceiving the possibility of creating new businesses or significantly improving the position of existing businesses with a profit potential (Christensen et al., 1989). Carland, Hoy, Boulton and Carland (1984) pointed out the distinction between small business owners and entrepreneurs and characterized entrepreneurial ventures as motivated by innovative behavior and strategic practices with the goals of profitability and growth. Thus defined,

entrepreneurship involves seizing opportunities and converting these opportunities into workable/marketable ideas, adding value through time, effort, money or skills; assuming the risk of the competitive marketplace to implement these ideas and realizing the rewards from these efforts (Kuratko & Hodgetts, 1998, pp.672). Most scholarly definitions suggest that opportunity recognition is a process influenced by many contextual factors in the external environment (Long & McMullan, 1984; Gaglio & Taub, 1992; Singh, 1998), most importantly the availability of resources (Timmons, 1994) and the creative attributes of an individual (Hills et al., 1999).

Various theories and empirical studies have converged on the idea that recognizing opportunities for viable new ventures are related to having access to specific kinds of information. Entrepreneurial opportunities depend on asymmetries of information and beliefs (Shane & Venkataraman, 2000) and "successful creations are generally preceded by investigation and information gathering" (Kuratko & Welsch, 2001, pp.153).

The Austrian theory of entrepreneurship, a major theoretical perspective on the entrepreneurship process, developed within the economic framework is based on the perfect information hypothesis (Hayek, 1945; Kirzner, 1973). The Austrian theories define entrepreneurship based primarily on asymmetry of information and argue that in a competitive market economy information gaps exist and knowledge is unevenly dispersed (Hayek, 1945). The Austrian theories stress the importance of market arbitrage in identifying opportunities (Kirzner, 1973) and argue that marketplace inefficiencies create disequilibrium profit opportunities (Kirzner, 1979; Kaish & Gilad, 1991). Entrepreneurs' contribution to economic development stems from their ability to both identify and exploit market opportunities. These theories suggest that "entrepreneurs have the ability, based on their knowledge, to exploit the identified opportunity" (Westhead & Wright, 2000, pp.xiv). They suggest that entrepreneurs exploit opportunities through learning and knowing things that others do not (Kirzner, 1973; 1979) and only those who have specific information can discover entrepreneurial opportunities (Kirzner, 1973). Therefore, knowing where to look for information is more useful than merely having some market knowledge (Kirzner, 1973). Austrian theories emphasize that individuals cannot identify all opportunities but possession of information allows them to recognize particular opportunities (Hayek, 1945; Kirzner, 1997).

Creative destruction theory, introduced by Schumpeter, also stresses the role of information in discovering opportunities and bringing innovations to market (Schumpeter, 1942). Entrepreneurs develop innovative processes to find combinations of new products, production or organizational methods, markets, sources of input or market structures (Schumpeter, 1934; 1942). Schumpeter's theory regards the role of an entrepreneur as an innovator who brings innovations to the market and creates a new supply and demand curve for new products or services that replaces outdated products or techniques and thereby resulting in creative destruction (Schumpeter 1934). Creative destruction theory stresses the importance of active search for information in seizing entrepreneurial opportunities and in bringing innovations to the market. Creative destruction theory emphasizes that opportunities are not accidental events but the result of an active search for information that leads

to new and radical entrepreneurial possibilities for new markets, products, methods or techniques (Schumpeter, 1934; 1942).

Prior empirical research also found that exposure to information coming from various sources leads to creativity, innovation and new knowledge and is found to be significantly related to opportunity recognition (Julien & Vaghely, 2001). Bhave (1994) proposed that in externally stimulated opportunity recognition during the pre-venture phase, individuals identify entrepreneurial opportunities through learning from various external sources. McMullan and Long (1990) stressed that recognition of opportunities is linked to physical and social reality and suggested that opportunity identification is a learnable skill. In other words, having access to or searching for information is critical for recognizing opportunities (Busenitz & Barney, 1996; Kaish & Gilad, 1991; Bhave, 1994).

As information is perceived to be so important in opportunity recognition, a number of earlier studies focused on possible sources of information in opportunity recognition. Some individual level variables such as social networking (Singh, Hills, Hybells & Lumpkin, 1999), prior knowledge (Shane, 2000), cognitive skills (Baron, 2003) were found as important sources of information in discovering opportunities. Although these findings are valuable contributions to research on opportunity recognition and aid in our understanding this process, earlier research mostly used heterogeneous samples with no controls of the industry sector.

SOURCES OF INFORMATION IN ENTREPRENEURIAL OPPORTUNITY RECOGNITION

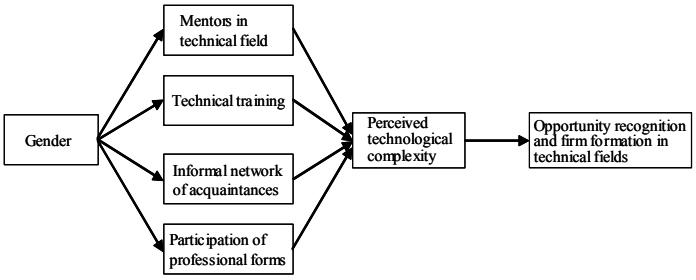
Previous research found that reliance on mentors (Kuratko & Welsch, 2001; Ozgen & Baron, 2006), technical training (Knudsen et al., 2001), informal network of acquaintances (Singh, 2000) and participation in professional forums (Ozgen &Baron, 2006) are important sources of information in entrepreneurial opportunity recognition. To date we do not know whether women and men have equally access to these sources of information or differ in their reliance on these sources in opportunity recognition in technical fields. We also do not know whether men and women entrepreneurs differ in their reliance on these sources of information in opportunity recognition when the technical status of the environment is perceived to be complex. The proposed model is shown in Figure 1.

MENTORS IN TECHNICAL FIELDS

Mentors refer to people who provide advice, guidance, knowledge, coaching as well as access to social and business networks (Darwin, 2000). Mentors are older and more experienced individuals with long years of experience (Darwin, 2000) who actively assist protégés in their careers and guide them technically and professionally (Ragubsm & Scanruda, 1999). In other

words, in mentor-protégé relationships the younger and less experienced person is guided by a mentor who provides with relevant information that is gathered over long years of experience (Darwin, 2000). Mentoring is the establishment of a personal relationship for the purpose of professional instruction and guidance. Mentors help protégés acquire useful skills and knowledge (Clutterbuck & Ragins, 2002). Previous literature implied that mentoring relationships play a significant role in entrepreneurial pursuits. Baron (2002, pp. 19) argued that "it seems possible that some entrepreneurs, at least, choose to start new ventures because they have been exposed to mentors, older and more experienced persons who have already started new ventures and can serve as a mentor who helps them to avoid important pitfalls in this process."

Figure 1



Mentors are part of the environment that could assist or impair new venture creation (Bruyat & Julien, 2001) and broaden potential entrepreneurs' perception of opportunities (Kuratko & Welsch, 2001) providing advice, guidance, knowledge and coaching in managerial and industry specific areas of the business, support (Whitley, Dougherty, & Dreher, 1991; Boyd & Vozikis 1994; McVey, 1997) and access to various networks. Kuratko and Welsch (2001, pp.180) suggest that "Mentors are vital for innovation development in particular" and can provide "multiple perspectives and multiple schema that could broaden protégés' perceptions of desirability and feasibility. Previous empirical research found that mentors can have beneficial effects for entrepreneurs, assisting them in their efforts to identify opportunities for new ventures (Ozgen & Baron, 2006).

Therefore, having a mentor in a similar industry may assist the individual in making contacts in the field, such as with financiers, suppliers, and customers, increasing industry specific knowledge and access to experience based and informed decision-making. Having access to a pool of experience and expertise through a mentoring relationship in a certain field may provide relevant resources and information to potential entrepreneur that will increase the probability of discovering an entrepreneurial opportunity. Mentors were found very useful in helping women develop management skills and coaching them up the corporate ladder (Ragins, 1999).

Prior researchers have shown that women entrepreneurs use more external business support, such as advice, guidance and coaching, compared to men entrepreneurs (Mitchell & Weller, 2001).

For instance, 46% of women entrepreneurs versus 37% of men entrepreneurs reported the role of having a mentor or role model in their entrepreneurial pursuits (Break The Glass Ceiling Foundation, 2003). Previous research also found that women entrepreneurs seek out others' opinions, inputs and help more than men entrepreneurs when making business decisions (NFWBO, 1999). In a similar vein, previous studies identified some critical factors, such as less business experience and a lack of role models that may affect women's tendency to pursue entrepreneurial activities (Chell, 2002; Mitchell & Weller, 2001).

Further in research among Scandinavian entrepreneurs, it was found that women entrepreneurs are less likely to write business plans and to be less educated than men entrepreneurs (Alsos &Lungren, 1998). Some previous studies on business start-ups indicate performance differences between men and women owned ventures due to different levels of business experience. Thus, grounded in prior empirical research, we assume that women entrepreneurs may show more willingness than men to seek business guidance, advice and coaching from mentors that will equip them with the necessary skills for the exploitation of entrepreneurial opportunities.

Proposition #1: *Women and men entrepreneurs differ in their reliance on mentors in entrepreneurial opportunity recognition in technical fields.*

TECHNICAL TRAINING

Previous research found that an individual's background equips them with necessary skills and competencies to link the individual to resources and discovery of opportunities (Knight, 1921). Vesper (1990) identified four elements in venture creation: a profitable business opportunity, technical knowledge of the entrepreneur, and the business knowledge of the entrepreneur and entrepreneurial initiative (Vesper, 1980). Using field studies and survey methods, Christensen and Peterson (1990) found that profound market or technological knowledge, are often a source of venture ideas. Davidsson (1991) suggested that a low level of technical and business skills could prevent individuals from starting a venture.

Shepherd and DeTienne (2001) found that knowledge and experience play an important role in identifying opportunities. To identify an idea and recognize an opportunity in a specific technical field, it is crucial to be knowledgeable about the domain and have a solid understanding of the knowledge base. The role of training and education is central in identifying, assimilating and absorbing new knowledge (Knudsen et al., 2001). Formal education may provide prior mental programming, which is positively correlated with venture start-up success (Vesper, 1990). Knowledge embedded in individuals shapes their capacity to create new knowledge (Cohen & Levinthal, 1990). Knudsen et al. (2001, pp.4) indicated: "the role of training and education must necessarily be central to the process of absorption since it requires some level of knowledge to identify, assimilate and absorb new knowledge."

Information acquisition presupposes that the entrepreneur is "uniquely prepared" and is actively looking, or at least listening for, specialized information (Julien & Vaghely, 2001). Shane (2000) found that prior knowledge prepares the mind and increase the ability to detect and synthesize information related with that background and plays a crucial role in the opportunity recognition process. As a result having technical training may help individuals filter signals from the environment, adapt complex technical developments and utilize available information processing in identifying profitable opportunities for viable new ventures. Previous research found that the low level of technical and business skills could prevent individuals from starting a venture (Davidsson, 1991). Therefore, entrepreneurs with technical training may recognize more entrepreneurial opportunities in a related technical sector since knowledge, information, and skills obtained from prior training could facilitate seizing opportunities in technical domains. Cross cultural research results from different countries such as Eastern Europe and Hungary, also indicate that women's low level of technical knowledge restricts their ability to succeed in entrepreneurial activities (OECD, 1993).

According to NSF report 2002, although women with technical degrees increased 50% over the course of two decades, women are still less likely than men to have technical degrees. Moreover, according to the NSF report among employed individuals with technical degrees women are less likely than men to be employed in business or industry but more likely to be employed in educational institutions. The NSF report reveals that representation of self-employed females and males with technical degrees differ by field of occupation. Among the total self-employed individuals with technical degrees, females are more likely than males to be self-employed in social science and less likely than males to be employed in engineering and computer/math science fields. For example, in 1999 75% of females and 24.3 % of males in the business sector were self-employed in social science whereas 35.1% of males and 2.9% of females in engineering and 24.7% of males and 12.6% of females in computer/math science (NSF, 2002). Therefore we think that women's lack of technical training may pose obstacles in their recognition of opportunities in technical fields compared to men entrepreneurs. Hence, we suggest Proposition #2.

Proposition #2: *Women and men entrepreneurs differ in their reliance of technical training as a source of information in entrepreneurial opportunity recognition in technical fields.*

INFORMAL NETWORK OF ACQUAINTANCES

Social Network Theory suggests that resources from an individual's social network heavily influence the decision to create an entrepreneurial start-up. Social capital theory emphasizes that network ties provide potential or possibilities of access to resources and information that is critical to venture formation. Prior empirical research found the significance of social structure and networks in shaping the entrepreneurial process (Aldrich & Zimmer, 1986; Butler & Hansen, 1988; Singh, 2000). Personal networks play an important role in new venture development since they

provide opportunities to manage information, values and resource flexibility to overcome barriers (Johannisson, 1990; Johannisson, 1996; Ostgaard & Birley, 1996; Singh, 2000).

Informal networks of acquaintances in technical fields include, among others, current or past customers, current or past suppliers and employees of financial institutions with whom entrepreneurs deal. Prior research suggests that the broader entrepreneurs' informal networks, the more likely they will gather relevant information (Singh, 2000). Hills et al. (1997) reported that entrepreneurs who used social network sources to get information on identifying new venture ideas and recognizing possible opportunities identified significantly more opportunities than those who did not use social network sources. Further, Hills et al. (1997) also found that social network contacts allow individuals to learn from a wide range of information that leads them to assess ideas that they did not think before. The size of an entrepreneur's social network is significantly associated with the identification of a number of new venture ideas (Hills et al, 1997). Therefore, networks and informal network of acquaintances play a key role in linking entrepreneur to resources and recognition of opportunities (Sexton & Bowman-Upton, 1991; Ozgen &Baron, 2006).

Past studies suggested that women business owners have less executive experience and fewer financial assets than their male counterparts when they start up new ventures (Carter & Allan, 1997) and therefore they (60%) consult with outside sources for information more than their male counterparts (44%) (Schatz, 2001). Technical fields are complex, intensive and changing rapidly and therefore may pose obstacles and create more need for consultation for information with outside sources. If women entrepreneurs have more information gaps than men entrepreneurs they may need for consultation for information more than men in the recognition of entrepreneurial opportunities in technical fields. Therefore, we suggest Proposition #3.

Proposition #3: *Women and men entrepreneurs differ in their reliance of informal network of acquaintances in entrepreneurial opportunity recognition in technical fields.*

PARTICIPATION OF PROFESSIONAL FORUMS IN TECHNICAL FIELDS (CONFERENCES, SEMINARS AND WORKSHOPS)

Shepherd and DeTienne (2001) found that knowledge and experience play an important role in identifying opportunities. To identify an idea and recognize an opportunity in a specific technical field it is crucial to be knowledgeable about the domain and have a solid understanding of the knowledge base. Therefore, having specific information is crucial both in evaluating a venture idea (Shane, 2000) as possession of information related to a particular opportunity leads to opportunity discovery (Hayek, 1945; Kirzner, 1997).

Entrepreneurs also seek information about developments in their fields through more formal channels than their industry networks (e.g., Bhave, 1994). The frequency and intensity of exchanged information may lead individuals to learn new possibilities, form ideas and identify opportunities. Liao and Welsch (2001, pp.319) stated "Technology ventures, particularly in knowledge-intensive

sectors, in general place more emphasis on information and knowledge accumulation and learning than non-tech ventures which largely focus on access to relatively static external resources, such as financing, manufacturing capacity and distribution channels".

Since knowledge acquisition has a significant role in creating opportunities, keeping industry-specific knowledge up to date by attending advanced training programs, instructional seminars and professional workshops may provide for diffusion of knowledge. Individuals in technical fields often seek information about current developments in their field through more formal channels (Bhave, 1994). For instance, they attend conferences, seminars or workshops as they can be a valuable source of information in their recognition of viable entrepreneurial ventures. Nascent entrepreneurs attend such meetings and gather information on current developments in their field presented by knowledgeable individuals. This information, in turn, can assist them in identifying entrepreneurial opportunities. Recent empirical research found that the greater the extent to which nascent entrepreneurs participate in professional forums, conferences, seminars, etc., the more likely they will be to recognize opportunities for new ventures (Ozgen & Baron, 2006).

Previous studies found that women use information channels slightly more often than men in their entrepreneurial pursuits (Aldrich, Brickman & Reese, 1997). According to NFWBO's (1998) research, it was found that 85% of women entrepreneurs give greater importance to information flow, workshops and training in business related issues compared to 78% men. Other studies found that women have more information gaps (Chell, 2002; Mitchell & Weller, 2001) and that lack of business information may restrict women's ability to succeed in their entrepreneurial pursuits (Allen & Truman, 1993). Previous studies emphasized differences between men and women entrepreneurs regarding their need of information, yet previous studies did not control the industry sector. Do men and women entrepreneurs differ in high demand technology sector regarding their need of information? We think that they do. If women have more information gaps than men they may rely more on participation in professional forums, conferences and seminars in gathering information that will help them in their recognition of opportunities. Therefore we suggest Proposition #4.

Proposition #4: *Women and men entrepreneurs differ in their participation in professional forums, conferences and seminars, in entrepreneurial opportunity recognition in technical fields.*

PERCEIVED TECHNOLOGICAL COMPLEXITY

Previous research found that opportunity recognition is a process influenced by many contextual factors in the external environment (Gaglio & Taub, 1992; Long & McMullan, 1984). The level of technological complexity involves the technical status or difficulty of the environment. To date, much previous research and theory converge on the thought that technological uncertainty stimulates waves of innovation creating entrepreneurial opportunities (Schumpeter, 1934). Particularly in technology ventures, the ever-changing pattern of environmental factors creates

technological uncertainty stimulating entrepreneurial opportunities (Tushman & Anderson, 1986). Technological uncertainty involves an individual's ambiguity or vagueness about the technical status and perceived incapability to completely understand some aspects of the technical environment (Milliken, 1987). Therefore, as the technological uncertainty increases, the level of technological complexity or the technical status of the environment increases. Based on the previous research which links technological uncertainty to opportunity recognition (Bourgeois, 1985; Bourgeois & Eisenhardt, 1988), it is logical to assume that perceived technological complexity plays a role in entrepreneurial opportunity recognition.

Prior research found that environmental uncertainty influences the extent of information gathering for innovation (Burns & Stalker, 1994). Therefore, as technological uncertainty increases, perceived technological complexity increases. This, in turn, influences the need for the information gathering and impacts entrepreneurial opportunity recognition. Thus, as the technical environment gets more complex, entrepreneurs need more information to handle the complexity. As they gather more information they increase their confidence and capability to completely understand some aspects of the technical environment. Hence, they increase self-efficacy and become more proactive in searching for opportunities in that environment. Previous research found that individuals high in self-efficacy believe that they can successfully develop the opportunities they discover (Gaglio & Katz, 2001; Ozgen &Baron, 2006).

In sum, perceived technological complexity moderates the extent of entrepreneurs' reliance on technical training and informal network of acquaintances as a source of information in their recognition of opportunities in technology domains. In other words, we assume that reliance on such sources will be significantly related to the perceived technological complexity and technological complexity in turn, will be significantly related to discovering opportunities for new ventures in technical fields.

Because of the complexity of this issue, further research that explores the relationship between perceived technological complexity and some sources of information would be timely and worthwhile. For instance, among the important research questions to explore are whether there are any difference between men and women entrepreneurs in their reliance on the sources of information in recognizing opportunities in complex environments and to what extent does their reliance on the sources of information vary? Which sources of information do women entrepreneurs rely on the most in recognizing opportunities and which sources of information do women entrepreneurs have the most difficulty of gaining access? Does this lack of access to information pose barrier to women entrepreneurs?

CONCLUSION

At present, although women business owners are increasing represented in technology sectors they still represent a small minority in technology leadership roles in larger, more established

firms. Technology markets are complex, intensive and are changing rapidly changing. Therefore, understanding the process by which new ventures emerge in technology domains is clearly one of the key challenges for entrepreneurship researchers. It is particularly important to understand how women entrepreneurs recognize opportunities in technical fields. Such a study would be very timely and helpful in our understanding the challenges women face with in starting new ventures in technical fields as well as assuring that their talents are being used effectively. Some future avenues of research could be:

> How to increase women's participation in technical programs and encourage their starting up new ventures in technical fields?
> What are the appropriate policy interventions that might help women in technical fields?
> Are there training and support programs that could be designed to help women entrepreneurs in technology ventures have a larger impact in business, achieve success, and foster new ventures?

Studying opportunity recognition and firm formation will clearly have implications both for training nascent entrepreneurs in high tech domains and for entrepreneurship education that might be expanded in the nation's schools and universities. Joining in programs that facilitate peer interaction may also assist women in developing networking and opportunity recognition skills. Programs that include the match up of mentors with the participants may provide on-going support to women who are potential entrepreneurs in networking skills and assisting them in identifying and finding various resources that would help them to recognize opportunities. To better teach opportunity recognition to prospective women entrepreneurs in technical sectors, it is necessary to study this process further.

In sum, we believe that the concepts presented in this paper offers a perspective into the nature of opportunity recognition and firm formation of women entrepreneurs in technology domains and provides insight to both theory and practice in the field of entrepreneurship. Further study and more empirical research will be necessary if we are to fully understand the dynamics of this vital issue and this research survey helps to identify some of the important factors that influence women entrepreneurs.

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SMALL BUSINESS GROWTH: EXPANSION OF THE WORKFORCE

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ABSTRACT

While growth of sales, profits and geographic expansion of small businesses have been examined in numerous studies, little research exists examining when a small business should increase the size of its workforce. The present study attempts to address this gap in the literature by examining if organizational planning, communication, human resource management problems, and trusting employees might indicate when a small business should increase its number of employees. The findings indicate that as human resource problems begin to emerge, increasing the size of the workforce might begin to resolve some of these problems.

INTRODUCTION

Over the past 20 years, interest and research in small business has grown considerably (Barringer & Greening, 1998; Davidson, 1987; Kotey & Slade, 2005; Nicholls-Nixon, 2005). In addition to increased interest in small business, small business represents more than 75 percent of the nation's new jobs, employing more than 50 percent of the private sector workforce (Scarborough & Zimmerer, 2003). These numbers have increased while big business and corporate America continues to shrink their workforces (Holt, 1993; Howard, 2001). Even though the evidence indicates that small businesses are a big player in the U.S. economy, most of the research to date has focused on profits and sales, with little focus on growth of the workforce in small businesses. Additionally, most of the research on the growth of the workforce has been largely descriptive and exploratory, not providing much insight into when the conditions might be right for a small business to expand its workforce (Howard, 2001).

The present study attempts to extend the research to date by attempting to identify factors that might indicate when a small business should consider expanding its workforce. Recently, scales designed to measure organizational planning, communication, trust and human resource management problems have been developed specifically for small business (Howard, 2006). These scales will be used to determine the influence of these concepts as antecedents of small business growth. Additionally, sales, profits, market share and organizational size will be controlled to determine the independent effects of planning, communication, trust and human resource management problems on growth of the number of employees. First, this study will discuss the literature on growth of small businesses, planning in small businesses, communication in small

businesses, trust of employees in small businesses, and human resource management problems in small businesses. Relationships between planning, communication, trust and human resource management problems with growth in employees will be presented. A brief statement concerning the control variables will also be presented. Second, the research methods will be described. Third, the results of the study will be presented. Finally, a discussion of the results and their implications on future research will be presented.

SMALL BUSINESS GROWTH

There exist many different definitions of small business. Additionally, numerous conditions that apply to different definitions exist, further influencing what is considered to be a small business. While one could spend endless amounts of time trying to develop their idea of a perfect definition of a small business, the definition to be used in the present study is "one that is independently owned, operated, and financed" (Hatten, 1997, p. 5). Additionally, the business is one that would not be dominant in its field of operation, having little impact on its industry (Hatten, 1997; Hodgetts & Kuratko, 1995). Finally, the following criteria are also considered as they pertain to the present study (Hodgetts & Kuratko, 1995):

Manufacturing firms employ fewer than 250 employees;
Annual sales of less than $22 million in the wholesale sector;
Annual sales of less than $7.5 million in the retail sector;
Annual sales of less than $10 million in the service sector.

Historically, most of the literature on small business focuses on firm growth, with a specific examination of either revenues and profits or challenges facing small businesses as they grow (e.g., Box, Crouch & Clow, 1998; Covin, Slevin & Covin, 1990; Gray, 1999; Hambrick & Crozier, 1985). More recently, additional factors such as planning, communication, trust and human resource problems have been examined as factors that might influence small business growth (e.g., Dyer, 1996; Howard, 2001; Kotey & Slade, 2005; Nicholls-Nixon, 2005). In the following sections of this paper, the literature associated with firm growth will be presented. Following this information, the literature associated with planning, communication, trust and human resource problems will be presented. Hypotheses regarding the relationship of these factors on firm growth will be presented as each factor is discussed. Finally, a brief discussion of control variables will be presented prior to moving on to the research methodology.

Firm Growth

The growth of small businesses has been studied and modeled for a considerable time, with books dedicated to the process that firms go through as they grow (e.g., Flamholtz, 1990). Much

of the research has focused on firm growth based on sales, revenues, profits and market share (Boardman, Bartley & Ratliff, 1981; Roper, 1999). Certainly, without sales and profits, an organization will likely have a short life, and this is widely known fact to small business owners and students of small business issues (Johnson, Conway & Kattuman, 1999; Kuratko & Hodgetts, 2001; Stephenson, 1984).

Over the years, there has been increasing interest in the growth of small business in areas other than sales and profits. An area that might relate to the size of the firm in terms of the number of employees focuses on geographic expansion (Barringer & Greening, 1998; Greening, Barringer & Macy, 1996). As one expands into new markets, typically additional employees are required to service those new markets. Given this, these studies, while focusing on geographic expansion, begin to address growth of the number of employees in the firm. However, more recently there have been attempts to examine the growth of the organization specifically in terms of the number of employees (Howard, 2001). While this research was largely exploratory, it begins to address a gap in the research. Specifically, the actions an organization should take when expanding the workforce occurs are addressed. While this is information that small business owners and managers need to be aware of when they expand, it could also be interpreted as the conditions that exist when a small business is ripe for increasing the size of its workforce.

Planning

As organizations grow, it is common for the organization to develop plans (Flamholtz, 1990). In some cases these plans will be formalized, while in others the plans will be informal, focusing on employees sharing a common understanding about the direction of the organization and the actions that need to occur as the organization moves forward. For example, approximately 21 percent of successful businesses have been found to have formal business plans (Bhide, 2000), indicating that the majority of successful businesses do not have formal, written plans. While many businesses do not have formal plans, it has been found that shared business logic does exist among growing small businesses (Nicholls-Nixon, 2005). This might indicate that even though formal plans do not exist, small business owners are thinking about and considering the business decisions and moves that they need to consider, since planning can take many forms and may not always be in written form.

Small business research has begun to incorporate human resource management concerns into the research issues, such as planning in small business (Howard, 2006). This research has begun to examine the question of when a small business should expand its workforce (Hodgetts & Kuratko, 1995; Howard, 2001; Tucci, Wyld & Cappel, 1997). Given that only a small percentage of business owners have formal business plans (Bhide, 2000), it is very likely that human resource planning does not occur either (Howard, 2001). This indicates that many businesses move forward without a sound business plan, let alone a developed plan of when to increase the size of their workforce.

While not having a written, formal plan is not an earth shattering finding, there exists evidence that planning does influence the success of small businesses. When examining businesses that have formal plans, the evidence indicates that these businesses grow at faster rates than businesses that do not have formal plans (Morrison, Breen & Ali, 2003). Many reasons might exist causing businesses with plans to grow faster than businesses without plans, and one of these reasons could be that these businesses understand that there is a relationship between increasing the number of employees and increasing the revenue of the firm (Box et al., 1998; Gray, 1999). Specifically, it has been found that in order to successfully expand the workforce in small businesses, planning for growth needs to be undertaken carefully, so that human resource practices and policies are adjusted appropriately, and in some instances formalized (Barringer & Greening, 1998; Greening et al., 1996; Kotey & Slade, 2005). This provides evidence that these businesses understand that planning in small business might be one indicator of when the business should expand its workforce (Howard, 2001).

Considering the research to date, while formal planning is not conducted in the majority of small businesses, efforts appear to be made to ensure that as small businesses move forward that everyone understands the direction of the organization (Bhide, 2000; Nicholls-Nixon, 2005). Nonetheless, evidence exists that growth is faster among firms with formal business plans, and that the decision-making of the small business owner and managers has a significant effect on small business growth (Morrison et al., 2003; Packham, Brooksbank, Miller & Thomas, 2005). Specifically, a lack of planning and development of a strategic direction has been found to inhibit growth among small firms (Beaver & Price, 2004; Hankinson, Bartlett & Ducheneaut, 1997). Given this, the following hypothesis is proposed:

H1: Planning in small businesses will exhibit a positive relationship with growth of the number of employees.

Communication

Communication within an organization is essential if the organization is going to survive. Communication as a firm expands its workforce might be even more important, given that communication difficulties have been found to exist as organizations grow (Greening et al., 1996). It is important to understand that communication will experience challenges during growth, and one way to address these challenges is to be proactive. This can be accomplished by ensuring that employees understand what is occurring, the implications of what is occurring, and being involved through communication (Dyer, 1996; Nicholls-Nixon, 2005). In other words, involving employees in the changes so that they understand what is happening and how the changes tie into the organization's objectives might be critical as a small business grows. Quality communication in organizations has been found to influence the empowerment of employees, job commitment, and

the ability to achieve organizational goals (Brunetto & Farr-Wharton, 2004). As a result, effective communication can enable employees to better assist the organization as it grows.

While increased communication can assist organizations as they grow, communication has also been found to have a positive relationship with organizational profits (Howard, 2001). However, the question remains as to how communication might begin to indicate when a business should consider expanding its workforce (Howard, 2006). When members of an organization communicate more, they are more likely to clearly understand the entire situation that faces them, since they have more information (Dyer, 1996; Nicholls-Nixon, 2005). Specifically, small business owners and managers should not only communicate more often, but they should also provide more detail of the direction of the organization, and its processes, when communicating with employees. Additionally, employees need to increase the amount of their communication so that small business owners and managers can ensure that they understand the organization's direction. Given this, the expectation is that as the amount and quality of communication increases, members of an organization will have a better idea of the resources they have, as well as the resources they need to support the achievement of their objectives. In some cases, this might mean more productivity, more material resources, or even more human resources. As it pertains to the number of employees, the expectation is that as communication increases, small businesses will have a better idea of when they need more employees (Howard, 2001). However, one must remember that it is both the quality and the quantity of the communication that is important, as that influences job commitment and the ability to achieve organizational goals (Brunetto & Farr-Wharton, 2004). Thus, the following hypothesis is proposed:

H2: Communication in small businesses will exhibit a positive relationship with growth of the number of employees.

Trust

Trust can be defined as "terms of confident positive expectations regarding another's conduct" (Lewicki, McAllister & Bies, 1998, p. 439). In order to develop trust, a positive history needs to exist between the parties, so that the positive expectations have time to develop, leading to trusting behavior (Tzafrir & Dolan, 2004). Trust has been found to reduce conflict within organizations, as well as allowing employees to work together, building on each other's strengths, resulting in positive situations as businesses are started (Perren, 1998; Sharif, Kalafatis, & Samouel, 2005). Small business owners need to develop trust in their employees if their employees are going to be effectively utilized. By trusting employees to do their jobs and step in as needed, small business owners and managers create a situation that allows them to attend to organizational issues that come with owning a small business. A lack of trust in employees can create situations where small business owners and managers fail to delegate tasks, creating an overload for themselves, since they will still need to attend to other issues, such as marketing, bookkeeping and managing

their personnel (Gomez & Rosen, 2001). Additionally, failing to delegate tasks to employees leads not only to their underutilization, but also might lead to small business owners and managers burning out (Howard, 2006).

Trust has been found to have a number of positive effects on organizations, to include increased productivity among employees with managers who trust them (Ferres, Connel, & Travaglione, 2004). Trust also has been found to have a positive relationship with profits (Howard, 2001). While no research has examined the potential influence that trust might have on increasing the number of employees, it is plausible that as small business owners and managers increase the trust in their employees, these owners and managers might be more likely to increase the size of their workforce, given that employee productivity, and potentially profitability, benefits from trusting owners and managers. Given this logic, the following hypothesis is proposed:

H3: Trusting employees in small businesses will exhibit a positive relationship with growth of the number of employees.

Human Resource Problems

Any organization that has employees needs to effectively manage their human resources if they want to succeed. Regardless of the amount of technology or the quality of the product being sold, employees are the critical difference in organizations. Without quality employees, no product can sell itself, and while technology can assist in decision-making, technology follows rules, while employees exercise judgment. It is important that small business owners understand this, ensuring that they address human resource management issues when running their small business.

In terms of human resource management practices, small businesses have been found to rely on techniques that are not formalized. For example, hiring decisions have been found to be based largely on the decisions of owner-managers, focusing on how well the applicant might fit into the organization, rather than on experience, education and skills (Kotey & Sheridan, 2004). Additionally, training is largely on the job, and does not focus on the overall development of the employees (Kotey & Sheridan, 2004). By not formalizing policies and procedures, if the manager-owner steps away from the business for an extended period of time, there is the chance that the organization will not move forward in a direction consistent with the owner-manager's vision, given that no else might know what this vision is.

Some small businesses have been found to proactively address human resource management concerns as they grow, formalizing human resource policies and increasing their recordkeeping of human resource management issues as they grow (Kotey & Sheridan, 2004; Kotey & Slade, 2005). These businesses have recognized that addressing these concerns will only help the business as it continues to grow, since legal regulations addressing discrimination exist in the United States with which organizations must comply once they reach a certain number of employees, most notably, 15 employees (Sovereign, 1994). Even though some businesses might attempt to proactively address

human resource problems, it is still possible that as small businesses grow some of the challenges they face will be associated with human resource management. Problems can develop, and have been found to center around having the right number of people for the job, having employees with the right skills for the job, as well as being able to provide salaries high enough to attract quality employees (Howard, 2001). This might indicate that the number of human resource challenges or problems facing organizations might possibly indicate that the organization is in need of increasing the number of employees, since there might not be enough employees to do the job, or employees might not have the right skills. Thus, the following hypothesis is proposed:

H4: Human resource problems in small businesses will exhibit a positive relationship with growth of the number of employees.

Control Variables

While the discussion thus far has focused on preliminary investigations which indicate that planning, communication, organizational trust in employees and human resource management problems appear to be consistent concerns for small businesses as they expand their workforce, there are certainly a wide variety of other influences on growth in small businesses. In order to effectively ascertain the influence of planning, communication, trust and human resource problems as indicators of when a firm should expand its workforce, other variables with known influences on increasing the number of employees need to be controlled.

Growth in sales, market share and profits have all been found to be related to firm growth in terms of the number of employees (Kuratko & Hodgetts, 2001; Stephenson, 1984). Unless goods or services are sold to consumers, organizations cannot survive, let along grow. Given the historical data supporting this relationship, these three variables will be controlled for when examining the hypotheses presented in this study.

The size of the organization will be controlled for as well. Because of the nature of the legal environment in the United States, organizations must seriously consider formalizing human resource management policies and procedures once they have 15 employees. This is because organizations must comply with Title VII of the Civil Rights Act of 1964, the Americans with Disabilities Act and the Civil Rights Act of 1991 once the organization has 15 employees (Sovereign, 1994). Because of the legal requirements associated with having 15 or more employees in the United States, it is reasonable to believe that once an organization has taken action to comply with these regulations, the mere fact of increasing the number of employees is not as daunting a task as it might be if an organization employs fewer than 15 employees. Organizations with fewer than 15 employees might be more reluctant to increase the number of employees, since it might not have the policies and procedures in place to ensure compliance with these regulations. Given this, size of the organization will be controlled for, such that a dummy variable for organizations with more than 15 employees will be included as a control variable.

METHOD

Sample

In order to test the proposed hypotheses, a systematic, random sample was drawn from a 10 county area in the Midwestern section of the United Sates. Two thousand small businesses were sampled from a list of 4000 small businesses that was obtained from the State of Illinois Department of Commerce and Community Affairs. In order to arrive at a sample of 2000 small businesses, a rule of selecting every other organization was utilized. Responding organizations ranged in size from 2 to 600 full time equivalent (FTE) employees, with a mean of 48.6 FTEs. Organizational sales ranged from $60,000 to $175 million, with mean sales of $9,373,840. Organizational profits ranged from -$450,000 to $50,000,000, with mean profits of $1,237,322, while organization's market share ranged from one percent to 100 percent, with a mean market share of 37 percent. One organization did report a market share of 100 percent, but this was the market share for one county, not the industry as a whole, consistent with the definitions used in this study. While a variety of definitions exist defining small business, when comparing these numbers to those of the definitions provided by Hatten (1997) and Hodgetts and Kuratko (1995), all of the numbers meet the criteria laid out in their definitions. In other words, the size, sales, profits and market share of the organizations was consistent with the type of business that the organization was in, whether that was manufacturing, wholesale, retail or the service sector.

Procedure

Surveys were sent to the owners of small businesses, if the owner could be identified. If the owner could not be identified, the surveys were mailed to the president of the small business. A cover letter describing the study, indicating that participation was voluntary and confidential, accompanied the surveys. Sixty days after the surveys were sent to small businesses, a follow-up letter was sent to encourage the organizations to complete the survey. Of the 2000 surveys mailed to small businesses, 154 usable surveys were returned, resulting in a 7.7 percent response rate. While the response rate is lower than desired, enough data was collected to test the proposed influences of planning, communication, trust and human resource problems on increasing the number of employees in small businesses.

Measures

As part of a comprehensive survey, participants evaluated several statements associated with their small business concerning planning, communication, trust and human resource problems. The participants rated these items on 5-point scales, ranging from 1 (strongly disagree) to 5 (strongly

agree). Additionally, the organization's size was measured based on information provided by the survey respondent. Finally, growth in the number of employees, profits, sales and market share over the past 5 years were all measures, using a 5-point scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Each measure is discussed below.

Planning.

Planning in small businesses was measured by a nine-item scale developed by Howard (2006). Scale items addressed a variety of planning concerns, and included the following two items: Planning is conducted in the business; the business ensures that all appropriate parties understand the business's plans. The items in the scale assess information regarding the level and type of planning in the organization, as well as how well understood the plans are by all parties in the organization. The alpha reliability of the scale was .88.

Communication.

Communication in small businesses was measured by a five-item scale developed by Howard (2006). Items in the scales addressed the amount and type of communication, and included the following items: Employees are informed of changes in the organization verbally; managers communicate verbally with employees on a regular basis. The items in the scale assess the different types of communication in the organization, the regularity and effectiveness of meetings in the organization in terms of communicating information. The alpha reliability of the scale was .79.

Trust.

Trust in employees in small businesses was measured by a three-item scale (Howard, 2006). The scale addressed the level to which the business trusts employees and manager's to do what is in the best interest for the business, and included the following item: The business supports managers and/or employees in the decisions they make. The items in the scale assess the level of trust of management in employees, as well as the trust that employees can step in as needed. The alpha reliability of the scale was .83.

Human resource problems.

The human resource problems in small businesses scale was measured by a four-item scale (Howard, 2006). Scale items focused upon human resource concerns that have been found to influence the success of small businesses, and included the following items: Some problems in the business are associated with hiring the right person; some problems in the business are associated

with having enough people for the job. The items assess the problems associated with proper staffing and compensation in the organization. The alpha reliability of the scale was .81.

Size.

The size of the small business was measured to ensure that the small businesses complied with the definitions of small business laid out by Hodgetts and Kuratko (1995). Once the data was collected, size was coded into a dummy variable, with 1 representing small businesses with 15 or more employees and 0 representing small businesses with 14 and fewer employees. The cutoff of 15 employees represents the point at which organizations must comply with a variety of employment legislation, as described earlier in this paper (e.g., Sovereign, 1994). Finally, organizations with 14 and fewer employees represented 48.4 percent of the sample, with organizations with 15 or more employees representing the remaining 51.6 percent of the sample. This item was constructed to control for the influence that the size of the organization might have on the increase of the number of employees in a small business.

Sales growth, profit growth, and market share growth.

Growth in these three categories was measured by a single item for each category (i.e., sales, profits, market share), and represents growth in these areas over the past five years. For example sales of the organization were measured with the following item: The business has experienced considerable growth in sales over the past 5 years. The items for profits and market share were identical to this item in structure. Each item was measured on a 5-point scale as described above (i.e., 1 = strongly disagree, 5 = strongly agree), in order to control for the influences that sales, profits and market share might have on the increase of the number of employees in a small business.

Employee growth.

This item serves as the dependent variable in the present study, and represents the growth of the number of employees over the past five years, and was stated as follows: The business has experienced considerable growth in the number of employees over the past 5 years. The item was measured on a 5-point scale as described above.

Analyses

Hierarchical regression was utilized to test the influence of planning, communication, trust and human resource problems on the growth of the number of employees over the past 5 years. In order to determine the influence of these variables on the increase of the number of employees over

a five year period, the organization's size, growth in sales, growth in profits and growth in market share were all entered into the regression equation in the first step. This allows for the influence of these variables known to influence the growth of the number of employees to be accounted for, prior to determining the influence of the variables of primary interest in this study.

In the second step of the hierarchical regression, planning, communication, trust and human resource problems were all entered into the regression equation. By entering these variables into the equation on the second step, the additional influence of these variables in explaining the variance of the dependent variable, growth of the number of employees over the past 5 years. Additionally, this also allows for the determination of which independent variables entered in this second step might significantly predict an increase in the number of employees in the organization over the past 5 years.

RESULTS

Table 1 presents the means, standard deviations, and zero-order correlations of the study variables. Growth in the number of employees was significantly and positively correlated with growth in sales ($r = .65$, $p < .01$), growth in profits ($r = .41$, $p < .01$), growth in market share ($r = .52$, $r < .01$), size ($r = .25$, $p < .01$), and human resource problems ($r = .19$, $p < .05$).

Table 1: Means, Standard Deviations, and Zero-Order Correlations

Variable	Mean	SD	Range	1	2	3	4	5	6	7	8	9
1 Employee growth	2.93	1.13	1 – 5	-								
2 Sales growth	3.41	1.09	1 – 5	.65**	-							
3 Profits growth	2.97	1.04	1 – 5	.41**	.62**	-						
4 Market share growth	2.95	0.97	1 – 5	.52**	.64**	.43**	-					
5 Size	0.52	0.50	0 – 1	.25**	.12	-.04	.13	-				
6 Planning	3.71	0.62	1 – 5	.15	.13	.14	.15	.27**	-			
7 Communication	3.92	0.55	1 – 5	.15	.20*	.13	.17*	.14	.49**	-		
8 Trust	4.05	0.59	1 – 5	.12	.05	.04	.08	.16*	.40**	.48**	-	
9 Human resource problems	3.68	0.70	1 – 5	.19*	.07	.07	-.01	-.06	.12	.11	-.06	-

Note: Diagonals are omitted. ** $p < .01$. * $p < .05$

The results of the hierarchical regression are reported in Table 2. The organization's size, growth in sales, growth in profits and growth in market share were entered in step 1 to control for the amount of variance explained by these variables, and these variables explained 45 percent of the variance in growth of the number of employees ($\Delta R^2 = .45$, $\Delta F = 27.41$, $p = .000$).

Table 2: Results of Regressing Employee Growth on the Independent Variables					
Step	Variable	B	ΔR^2	ΔF	p
1	Sales growth	.53**			
	Profits growth	.04			
	Market share growth	.17			
	Size	.36*	.45	27.41	.000
2.	Planning	-.08			
	Communication	-.11			
	Trust	.23			
	Human Resource Problems	.31**	.04	2.57	.041
$R^2 = .49$, $F = 15.63$, $p = .000$ Note: ** $p < .01$, * $p < .05$					

Planning, communication, trust and human resource problems were entered in the second step of the hierarchical regression in an attempt to determine the additional amount of variance explained by these variables ($\Delta R^2 = .04$, $\Delta F = 2.57$, $p = .041$). Human resource problems was found to significantly influence the growth of the number of employees ($b = .31$, $p < .01$), supporting hypothesis 4. These two findings indicate that these four variables collectively provide additional variance explained beyond the control measures of organization size, growth in sales, growth in profits and growth in market share, providing evidence of the influence of planning, communication, trust and human resource problems. Additionally, human resource problems exhibited a significant positive relationship with the number of employees, supporting the hypothesis that the presence of human resource problems in a small business is an indication of the size of the organization in terms of the number of employees.

DISCUSSION

Over the past several years, research on small business and entrepreneurship has begun to examine the influence of planning, communication, trust, and human resource management issues more closely (Bhide, 2000; Howard, 2006; Kotey & Slade, 2005; Morrison et al., 2003; Nicholls-Nixon, 2005). While this represents efforts to further understand the processes that need to exist in order for small businesses and entrepreneurs to succeed in their ventures, the influence of these areas on increasing the size of the workforce has been largely neglected. The present study was an attempt to address this need by determining the ability of each of these concepts to explain the growth of the workforce (Howard, 2001).

Hypothesis 4 received support, indicating that as human resource problems associated with staffing and compensation increased, so did the number of employees. This might indicate that

small business owners and entrepreneurs understand that in order to accomplish organizational goals in a manner that supports the survival and success of organizations, these same organizations need to consider investing in their workforce by increasing the number of employees in the organization. This is an important finding for both small business and entrepreneurship researchers and practitioners, since in many instances small businesses struggle with determining when they should expand the workforce (Howard, 2001). Often times the perception is that in order to expand the workforce, the organization needs to bring in additional capital to support such expansion. However, the results of the present study might indicate that when struggling with human resource problems, such as not having enough people to complete the job or not having the right number of people with the right skills in the right place at the right time, might indicate a need to increase the size of the workforce. It could even be the case that if the workforce is expanded, then the resulting increased efficiency of production might eventually lead to increased sales and profits. This is an interesting and important finding, since it could become an indicator of when to expand the workforce for small business owners and entrepreneurs.

Clearly, human resource problems and its significant relationship with the size of the organization represents a contribution of the present study. However, human resource problems was only one of four variables entered into the analysis during the second step. While this variable supports hypothesis four and is the only variable that is individually significant, it is the combination of this variable, along with planning, communication and trust that explained an additional four percent of the variance in employee growth in the organizations studied. While this is not a large amount of variance, it does indicate that this combination of independent variables does influence employee growth in organizations, and is worthy of additional examination in future research. For example, human resource problems may influence the planning, communication and trust in organizations. Furthermore, this might indicate the need to further refine the scale items in order to better identify the constructs of planning, communication and trust, so that the influence that these variables have on employee growth in organizations might be more fully understood (Howard, 2006). Another option would be to conduct a study that examines the influence of these variables on actual growth in small business, focusing on the numerical increase in employees in small business. While obtaining this type of data would be challenging, it would provide a more complete picture of the processes that are occurring in small business, benefiting both researchers and practitioners at the same time. Because of these possibilities, these variables deserve additional attention in order to determine the amount of variance that can be explained by them. This could reveal much about what influences growth in small business.

A third significant contribution of the present research is that employee growth can effectively be measured on a scale that requires small business owners, small business managers and entrepreneurs to make a judgment regarding how much they agree or disagree with the item. While the ideal situation would be to measure actual growth in terms of number of employees, as suggested in the previous paragraph, by utilizing a Likert-type of instrument, it is anticipated that small

business owners and entrepreneurs will be more likely to complete and return surveys to researchers. Measuring actual growth in terms of numbers of employees over a specific time would require small business owners and entrepreneurs to know specifically what the change was for the time period, possibly reducing the number of returned surveys, since some small business owners and entrepreneurs would need to research these numbers, imposing additional work on them. By being able to have small business owners and entrepreneurs use their judgment to indicate employee growth, the likelihood of returned surveys is increased. Additionally, the results of the study indicate that Likert-type items can begin to reveal the relationships influencing employee growth in small business, providing another avenue for which to study workforce expansion in small business.

Further examining the results of the study, it becomes clear that relationships exist between the size of the organization, planning, trust and employee growth. It could be possible that since organizations in the United States must comply with a considerable amount of employment legislation once an organization has 15 or more employees, they have taken necessary actions to ensure that they have effectively planned for and developed appropriate procedures and policies to ensure that they comply with this legislation (Kotey & Sheridan, 2004; Kotey & Slade, 2005; Nicholls-Nixon, 2005; Sovereign, 1994). Furthermore, once these policies and procedures are put in place in organizations, there is no longer the issue of worrying about being in compliance with the law, and as such, this would not be a reason holding an organization back from expanding its workforce (Morrison et al., 2003).

FUTURE RESEARCH

Hypotheses 1 through 3 did not receive support, indicating that planning, communication and trust did not significantly predict growth of the workforce in small businesses. While the results were not as expected, the results do reveal some potentially interesting relationships that might exist among these variables. First, the relationships among these variables need to be more closely examined in an attempt to determine if the relationships are correlational or causal in nature. For example, if the relationships are correlational in nature, then as organizations increase planning, communication and trust also increase at the same time. However, if the relationships are causal in nature, it could be the case that planning requires and causes increased communication and trust, and that this in turn might influence employee growth in small business. This represents an additional direction that future research should consider, as further understanding and accurately identifying the interrelationships among these variables could reveal important information for both researchers and practitioners (Howard, 2006).

A second area of future research should focus on the size of the organization and its relationship with planning. Specifically, once an organization has 15 employees, the legislation that the organization must comply with changes. Compliance forces organizations to ensure that they

are not discriminating against individuals protected by Title VII of the Civil Rights Act of 1964, as well as the Americans with Disabilities Act (Sovereign, 1994). This could potentially trigger additional planning within organizations. This could also influence the level of communication within the organization, and the trust between employees and managers. Given this set of relationships, it is important for future research to begin to identify any possible causality among these relationships, as well as the possibility that planning, trust and employee growth might systematically and significantly vary among small businesses, centered on the number of employees (15) which constitutes government compliance with various employment laws.

A possible limitation of the present study is that the organizations studied were from a 10 county area in the Midwestern section of the United States. While the sample did pull from all major SEC classifications, by surveying organizations from a larger region within the United States, or the entire country, differences that might exist between markets could influence the results, whereas the region that was surveyed might possess characteristics that are more, or less, conducive to successful, or unsuccessful, small businesses. These possible implications may never be known, but are acknowledged, and having a sample drawn from a larger region could effectively address this concern.

A second limitation of the present study is that the size of the organization was studied as a dummy variable; either an organization had 14 or fewer employees or it had 15 or more employees. While this cutoff is consistent with compliance with various pieces of legislation, by examining actual size of the organization, changes in the level of planning, communication and trust might become apparent as an organization increases its size. By examining the size of organizational at the ordinal level through the use of ranges of size (i.e., 0 – 14, 15 – 25, 26 – 50, etc.), the influence of size as organizations grow might be further revealed.

CONCLUSION

The present study demonstrates that researchers and small business owners might have available to them indicators of when small businesses should consider expanding their workforce. Human resource problems in small business, such as not having enough employees, might indicate when small businesses need to expand their workforce. This provides valuable information to both researchers and small business owners, and should be studies further to better identify the specific conditions that might indicate when a small business owner should expand his or her workforce.

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ONLINE MARKET INFORMATION AND ENVIRONMENTAL SCANNING ACTIVITY BY SMALL BUSINESS: THE CORRELATION BETWEEN FIRM'S CHARACTERISTICS AND ONLINE MARKET INFORMATION ACQUISITION

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ABSTRACT

One of the most significant marketplace changes in the last decade has been the advent of the Internet and its applications. It has altered the competitive landscape. This paper evaluates the correlation between the online market information and environmental scanning activity of small businesses and characteristics such as firm's size, industry sector, and firm's sales growth rate. It also reports the correlation between firm's characteristics and overall Internet usage. Larger enterprises are more likely to conduct online environmental scanning, and to use the Internet for business- related activities compared to smaller firms. There are also significant differences in online environmental scanning based on industry sector. Interestingly, firms with higher sales growth rate are more likely to report higher Internet usage and online environmental scanning activity. So, it appears that larger firms are more likely to use the Internet and conduct online environmental scanning, which in turn are correlated to higher sales growth, an important measure of success. Data was obtained from a national sample of small businesses.

INTRODUCTION

What has changed most radically in the last decade is the rate of change confronting small business and new ventures**.** Within a short span of time, the Internet and its affiliated innovations have revolutionized the way people think, work and play. It is an example where technological change has been compounded by the rapid adoption of this innovation by both businesses and consumers, which in turn has significantly altered the competitive environment. The Internet has permanently infected consumers and businesses with an expectation of speed, transparency and information search capabilities, which will only grow with time. There appears to be no immediate recovery from the increasing expectation of information access and applications the Internet continues to unleash. Even small firms can now have an online storefront, and expand their reach beyond any physical boundaries, which may have constrained them only a decade ago. Furthermore,

access to competitive information has been democratized in a manner, which creates tremendous transparency in information about a firm's product and service offerings and its competitors. What has not changed is the need for critical marketplace information, which is vital for firms to make more informed decisions, which impact directly on their success and survival.

LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

In 1992, Brush analyzed the marketplace information scanning activities of a sample of new ventures. Mohan-Neill (1995) extended Brush's study by evaluating whether there are differences in the environmental and marketplace information scanning activities of small businesses based on the firm's age and size. This current paper also focuses on the marketplace information and environmental scanning activities of small businesses. However, it does so in the context of the new technology-driven and technology-dominated external environment. The issues in this study focus on how have small businesses responded to this radically different external environment. How has the Internet impacted the marketplace information and environmental scanning activities of small businesses? Are the online market information and environmental scanning activities of small business correlated to firm characteristics such as size, industry sector and sales growth rate? Do other variables such as regional location and whether the business is home-based, also correlate with online marketplace information and environmental scanning activities?

Online marketplace information and environmental scanning activity was not addressed by either Brush (1992) or Mohan-Neill (19" b because it was not a viable method for gathering market information by most small businesses during the time period of those studies. The current study attempts to fill this research gap. It focuses primarily on the use of this new method of online marketplace information and environmental scanning activity, which has been created by Internet technology.

Mohan-Neill (1995) suggested that new ventures generally do not have a great deal of internal secondary data or historical experience to help fill their information needs, so in some ways new ventures may have a greater need for external marketplace information than more established ones. Research in entrepreneurship often describes the importance of scanning the marketing environment (Timmons 1985; Hills 1987; SBA 1987, 1988; Hills and Narayana 1989; Brush 1992; Mohan-Neill 1995). Research also suggests that the lack of marketplace information is a major problem for new ventures (Hisrich and Peters 1989; Chrisman and Leslie 1989; Kraft and Goodell 1989), and it is also a major barrier to new venture creation (Vesper 1990). Has Internet technology increased the marketplace information available to new and small firms, and more importantly, are they taking advantage of online market information resources?

Earlier studies also reported on the attitude of small business towards marketing research. Hills and Narayana (1989) reported that the perception by small business that formal marketing research is not valuable might contribute to the under-utilization of formal market research

(Robinson and Pearce 1984) by firms. So, even though marketing analysis was viewed as critical to the future of the venture, it ranked second lowest on the amount of time an owner/manager spends on it compared to other business activities such as financial analysis (Pelham and Clayson 1988). Recent studies have examined the relationship between environmental scanning and competitive strategy (Beal 2000), the technological aspect of environmental scanning (Raymond, Julien and Ramangalahy 2001), the relationship between uncertainty, environmental scanning and information sources (McGee and Sawyerr 2003), and the differences in environmental scanning based on organization size (Strandholm and Kumar 2003). This current research explores whether the online tools available to firms have increased their marketplace information and environmental scanning activity, and whether increased scanning activity is correlated with sales growth.

Brush (1992) categorized studies on marketplace information scanning in entrepreneurship into three groups: (1) business planning behaviors, (2) market research activities, and (3) environmental scanning. Fahey and King (1977) characterized environmental scanning as the process of seeking and collecting information about events and relationships in a company environment. Daft and Weick (1984) describe the process as formal or informal. Environmental scanning is the general process of information acquisition; market research activities are the methods utilized in the process (they can be formal or informal). Business planning behaviors are the utilization of the information acquired by the venture.

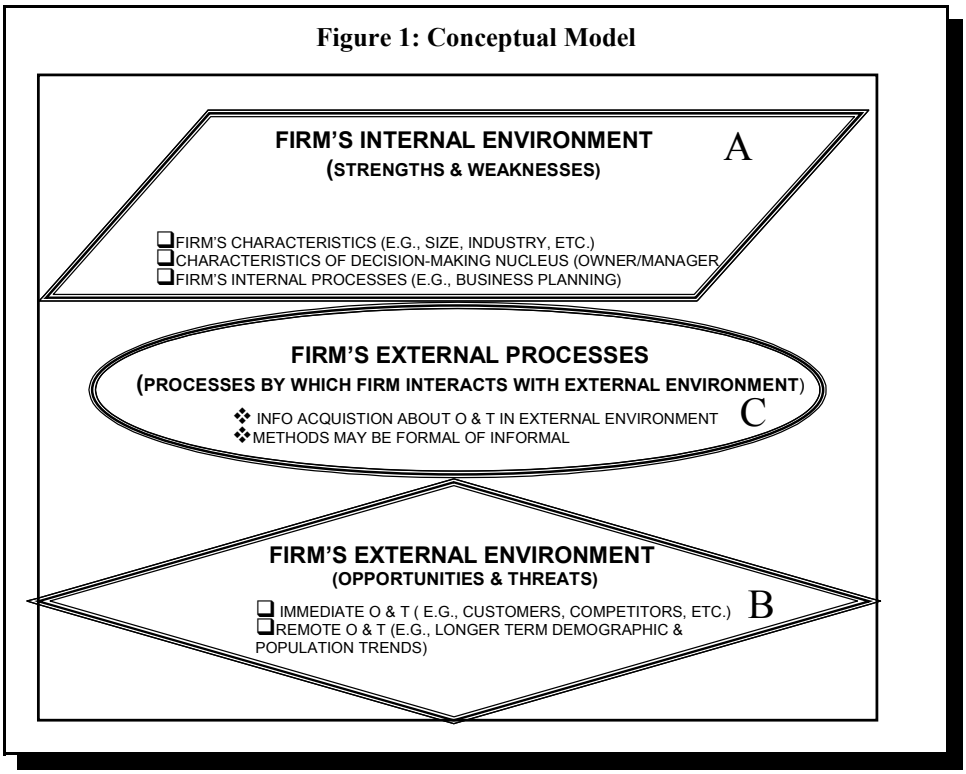
For the purpose of this study, a global or overarching construct called Online Marketplace Information and Environmental Scanning Activities (OMIESA) is utilized. It is a global and overarching construct or variable because it allows for the inclusion of any of the components described by previous researchers (Brush 1992; Daft and Weick 1984; Fahey and King 1997; Mohan-Neill 1995). In the current study, the focus is on the online component of the construct. Figure 1 illustrates the overall conceptual framework employed in this research. It is based on a framework initially proposed by Mohan-Neill, Hills, and Narayana (1990), and later utilized by Mohan-Neill (1995).

The early description of the conceptual model used a biological analogy of a single-cell organism, trying to survive in its external environment (Mohan-Neill, Hills, and Narayana 1990). Simply put any living organism has its internal characteristics, such structure and processes, which can be further classified as strengths and weaknesses (A). In order for the organism to survive, it must communicate and interact with its external environment. The external environment has elements, which can be classified as opportunities or threats (B). An opportunity may be food; a threat may be a predator. The external processes (C) are the means by which an organism interacts with its external environment. Not unlike small businesses, success of the organism is partially defined as survival in a competitive environment. This is accomplished by leveraging strengths, minimizing weaknesses, exploiting opportunities avoiding threats.

Similarly, a firm has its characteristics and internal environment (A), which contribute to its strengths and weaknesses. Examples of elements in A are firm's size, industry sector, owner's

education and attitude to use of technology. The firm's external environment (B) also has many elements, which impact on its success and survival. They can be further classified as opportunities or threats. Furthermore, there may be degrees of importance of the opportunities and threats in the external environment. Figure 1 illustrates that a further classification of these opportunities and threats into immediate and remote may be helpful. For example, a direct competitor cutting prices may be classified as an immediate threat. A long-term demographic trend affecting the firm's target market may be classified as a remote threat. Marketplace and environmental scanning is an example of an external process (C).

Figure 1: Conceptual Model



The specifics variables (Figure 1, A) addressed in this study are as follows: (1) Firm's size (based on number of employees), (2) Industry sector, and (3) Firm's Sales Growth. The disadvantages of these variables are that they are proxies for a firm's internal strengths and weaknesses. However, the significant advantage is that they are tangible and objective measures of a firm's profile. Firm size is often correlated with the firm's resources. Industry sector may provide a proxy for a number of other important characteristics of the firm. In some ways it captures elements in both the internal and external environment of a firm. It will also be very interesting to see whether there is a correlation between the firm's sales growth rate and its OMIESA. In order

words, is online environmental scanning activity correlated with a success measure such as a firm's sales growth?

The variables in B (Figure 1) represent the components of the firm's external environment, which are classified as opportunities or threats in the external environment. In this study, one variable is used to capture the information on opportunities and threats in the environment, Business related Information, for example, prices from competitors or suppliers. In the survey it was framed as a general question to capture whether firms gathered business information on competitors, customers, suppliers, etc. The question does not allow for distinction between immediate and remote information. However, based on previous research (Brush, 1992; Mohan-Neill, 1995), it seems logical to assume that online marketplace and environmental scanning activities would focus more on immediate opportunities and threats rather than longer-term or more remote threats. So a firm may collect pricing information (immediate impact), before it collects remote opportunities and threats in the environment (for example, demographic and population trends), which will impact the venture in the long term. Remote marketplace information is generally used for more long-term, strategic planning decisions.

In Figure 1, C represents the external processes, or the processes by which the firm interacts with its external environment. C represents external processes such as information acquisition methods. Immediate marketplace information is critical for many decisions, which affect a firm's survival and success in the short-term. Therefore, one would expect that all ventures (new and old) would view this type of information as very important. The methods employed can either be informal or formal (Brush 1992; Daft and Weick 1984; Mohan-Neill 1995). In 1995, Mohan-Neill suggested that since new ventures are less likely to have research expertise in-house or the resources to pay a research supplier, one can hypothesize that on average new ventures are less likely to use formal methods of data collection. Informal methods of data collection do not require research expertise, are inexpensive compared to formal methods, and can also be incorporated into the daily activities of small business owners/entrepreneurs. How has the current Internet technology changed the information acquisition process for firms?

An issue for the current study is how to classify online marketplace and environmental scanning. Is it a formal or informal method? One concedes that while it depends on the context, this study will classify it as an informal method for small firms. The second question is whether is requires more expertise than the traditional informal methods studied by Brush (1992) and Mohan-Neill (1995). One would argue here that although it is an "informal" method of scanning, it does require more expertise than traditional informal methods of data collection. The variables of interest in C are (1) Internet Usage (IU) and (2) Online marketplace information and environmental scanning activity (OMIESA).

RESEARCH METHODOLOGY

A descriptive survey research design was employed (Churchill 1995). The measurement instrument was a questionnaire administered during telephone interviews. Data was collected from a stratified random sample of U.S. small businesses. The sample size was 752 companies. The data was collected by the executive interviewing group at the Gallup Company, on behalf of the National Foundation of Independent Businesses (NFIB), and was funded by a number of corporate benefactors.

Sample Design

A national stratified random sample of small businesses was drawn from Dun and Bradstreet files in 2001. Since over 60 percent of employers have between one and four employees, a simple random sample would not yield a large enough representation of "larger" small employers. A disproportionate stratified random sample was drawn to provide an adequate number of firms in each size stratum. Small business is defined as any firm with 1-249 employees. The total sample of 752 firms is divided into three categories based on firm size.

Sample Profile

Firm size was measured by number of employees. The smallest firms have between one and nine employees and they represent a total of 352 firms (47 percent) in an overall sample. The intermediate size firms (those with 10-19 employees) comprise 200 (27 percent) of the overall sample. The largest of the small business in the sample (with 20-249 employees) comprised 200 or 27 percent of the overall sample (Figure 2).

Figure 2. Sample Distribution Based on Number of Employees

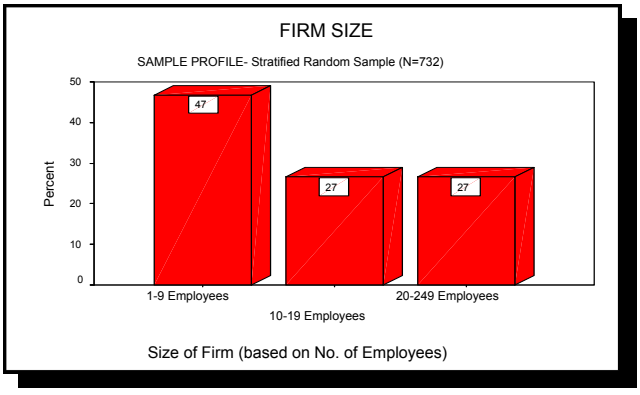


Table 1 illustrates the distribution of the sample based on industry sectors. Out of nine sectors, the largest is Services (41.5 percent of firms). The Services sector in this NFIB sample also represents 56 percent ownership by women (Mohan-Neill 2004a). Retail is the second largest sector and it constitutes 22.5 percent of the sample; Construction is third (10.1 percent), and Manufacturing is fourth with eight percent of firms (Table 1). The remaining sectors have less than five percent each (Financial services, Wholesale, Transportation and Agriculture).

Table 1. Distribution of Sample Based on Industry Sector (Ranked by Size).

Industry Sector	Rank	Frequency Number of Firms in Sector	Percent of *N*=752
Services	1	312	41.5
Retail	2	169	22.5
Construction	3	76	10.1
Manufacturing	4	60	8.0
Financial Services	5	29	3.9
Wholesale	6	25	3.3
Transportation	7	22	2.9
Agriculture, forestry or fishing	8	18	2.4
Communications	9	14	1.9
(Other)		14	1.9
Refused		13	1.7
Total		732	100.0

Table 2 illustrates the distribution of the sample based on sales growth rate. There are five categories of growth rate. The highest growth rate category is called SGR1 and it represents firms with a 30 percent or more increase in sales growth. Eighteen percent of firms in the sample are in SGR1, with a sales growth rate of 30 percent or higher. Firms in the second category, SGR2 category had the second highest increase in sales. SGR2 firms increased sales by 20 to 29 percent; they are 12.6 percent of firms in the sample. Firms in the third sales growth category are classified as SGR3 and they increased sales by 10 to 19 percent; they are 24.1 percent of firms in the sample, and SGR3 is the largest sales category in the sample. Firms in the fourth sales growth category are classified as SGR4 and their sales changed less than 10 percent one way or the other; they are 22.6 percent of firms in the sample. Firms in the fifth or lowest sales growth category are classified as SGR5, and their sales decreased by 10 percent or more; they are 7.6 percent of firms in the sample (Table 2).

Table 2. Distribution of Sample Based on Sales Growth Rate.		
Sales Growth Category (SGR)	Number Of Firms	% In Category
Increased by 30 percent or more (SGR1)	139	18.1
Increased by 20 to 29 percent (SGR2)	95	12.6
Increased by 10 to 19 percent (SGR3)	181	24.1
Changed less than 10 percent one way or the other (SGR4)	170	22.6
Decreased by 10 percent or more (SGR5)	57	7.6
Don't know	63	8.4
Refused	47	6.3
Total Firms	752	100.0

Eighteen percent of firms are located in the East; 20.3 percent are in the South; 20.9 percent are in the Mid-West; 19.9 percent are in the Central region and 20.9 percent are from the West. So, the regional distribution of the sample is relatively evenly distributed across the United States. Only 14.2 percent of firms in the sample reported that they operated their businesses out of their home. Approximately 56 percent of the sample (424 out of 752) owners are male, and approximately 44 percent or 328 are female business owners. There are six categories of highest level of education achieved. The modal category is owners whose highest level of education is a college diploma (35 percent or 260 business owners). The second largest group is owners with some college (24 percent or 182 owners). The smallest group is comprised of 10 owners who have not completed high school (1.3 percent). High school graduates are 20 percent (148 owners); graduates of technical or vocational school is the second smallest group (23 owners or 3.1 percent). About 12 percent of owners (93) have advanced or professional degrees.

Variables of Interest in Current Study

Multiple measures of Internet usage are examined in this study. The first measure (*"Do you use the Internet for business-related activities?" Nominal scale: Yes, No, Refused, Don't know*) captures overall Internet usage. The second measure (*"What business-related activities do use Internet for?" (Nominal scale: Yes, No, Refused, Don't know for each of the following options), (1) Email, (2) Gather business-related information, such as prices, (3) Purchase Goods or Services, (4) Conduct Financial Activities, and (5) Bid on Contracts.*) captures the specific uses of the Internet. Online Marketplace Information and Environmental Scanning Activity *(OMIESA)* is defined by ***"Gather business-related information, such as prices"*** *(Nominal scale: Yes, No, Refused, Don't know).*

The Sales Growth Rate variable was measured by asking the following question: *"Over the last two years, has your real sales volume…" (1) Increased by 30 percent or more, (2) Increased*

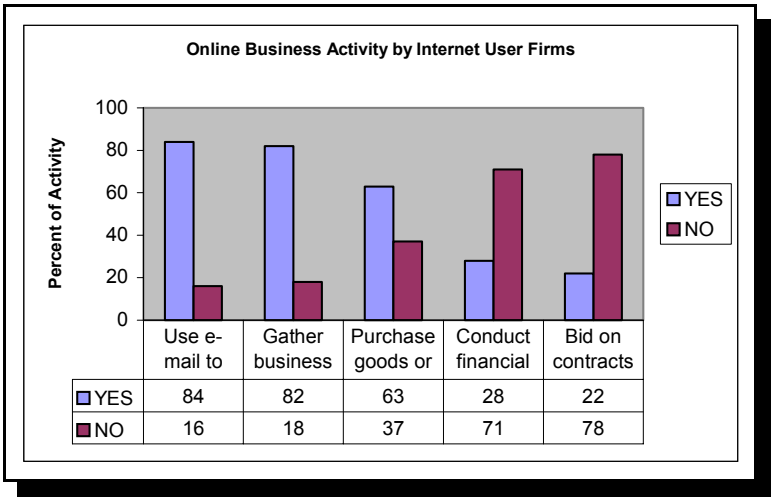
by 20 to 29 percent, (3) Increased by 10 to 19 percent, (4) Changed less than 10 percent one way or the other, or (5) Decreased by 10 percent or more?

RESULTS AND DISCUSSION

Overall Internet Usage

Mohan-Neill (2004b) previously reported a general description of Internet usage by firms in the NFIB sample. She found that 59 percent of all firms (n=752) use the Internet for business-related activity. Figure 3 illustrates the relative frequency of specific online business activities engaged in by the firms (n=444) that reported using the Internet. The highest overall Internet usage by firms in the NFIB sample is for email communication with customers, suppliers and other business contacts (84 percent of the entire sample reported email usage). The second highest online activity is described as ***"gathering business-related information such as prices***…" (82.2 percent of Internet user firms). In this paper this second activity is synonymous, and is used interchangeably with the terms "***online market information scanning", "online market scanning", and "online market information and environmental scanning activity" or OMIESA.*** Bidding on contracts online was the least frequent activity reported (21.6 percent).

Figure 3. Relative Usage of Specific Online Business Activities (n=444).



	Use e-mail to	Gather business	Purchase goods or	Conduct financial	Bid on contracts
YES	84	82	63	28	22
NO	16	18	37	71	78

Online Market Information and Environmental Scanning Activities (OMIESA)

Table 3 breaks out specific uses of the Internet, and it shows that 48.2 percent of the overall NFIB sample conducts OMIESA. When the number of firms using the Internet (*n=444*) is used as

the base, 82.2 percent of those firms use the Internet to conduct OMIESA or online market information scanning.

Table 3. Frequency of Specific Online Business-Related Activity.		
Online Business-Related Activity	Percent of Firms Using Internet *N*=444	Percent of All Firms *N*=732
Email	84.0	49.6
Gather Business-Related Information[a]	82.2	48.5
Purchase Goods Or Services	62.6	37.0
Conduct Financial Activities	29.9	16.5
Bid On Contracts	21.6	12.8
[a] Online Market Information and Environmental Scanning Activity (OMIESA)		

Correlation between Overall Internet Usage by Firm's Size

Hypothesis 1: Larger firms (firms with more employees) have higher overall Internet usage.

Mohan-Neill (2004b) reported that larger firms are more likely to use the Internet for business related activities. However, she did not test for statistical significance (Mohan-Neill 2004b). Table 4 illustrates the Internet usage by firms based on size, where size is defined by number of employees. SIZE 1 category has firms with one to nine employees; SIZE 2 category has firms with 10-19 employees, and SIZE 3 category has firms with 20-249 employees. SIZE 1 had 52.0 percent firms reporting overall Internet usage. SIZE 2 had 60.5 percent firms reporting overall Internet usage. SIZE 3 had 70.0 percent firms reporting overall Internet usage.

Table 4. Internet Usage Based on Firm Size.			
Firm Size	Number of Firms	Number Firms Using Internet	Percent Internet Usage
SIZE 1 (1-9 employees)	352	183	52.0
SIZE 2 (10-19 employees)	200	121	60.5
SIZE 3 (20-249 employees)	20	140	70.0
Total Firms	752	444	59.0

Table 5 presents the results for statistical significance tests for Hypothesis 1. In all cases, it appears that a greater percent of larger firms use the Internet for overall business-related activities (Table 4). However, the relative significance between groups differs in the magnitude of the statistical significance (Table 5). SIZE 2 firms (group with 10-19 employees) have a higher overall percent Internet usage than firms with 1-9 employees, in the SIZE 1 group ($t=1.95, p<0.05$). SIZE

3 firms (group with 20-249 employees) have a higher overall percent Internet usage than SIZE 2 firms (t=2.01, p<*0.05*).). SIZE 3 firms (group with 20-249 employees) have a higher overall percent Internet usage than SIZE 1 firms (*t=4.29*, p<*0.0005*). So the most significant difference is between the smallest and largest firms. There is about an 18 percent difference in Internet usage between SIZE 1 and SIZE 3 firms (70 percent vs. 58 percent). There is statistical support for Hypothesis 1. These results are consistent with previous studies, which show positive correlation between firm size and traditional market scanning activities by firms (Mohan-Neill 1995), and observed correlation between firm size and Internet usage (Mohan-Neill 2004b).

Table 5. T-test for Statistical Differences in Internet Usage based on Firm Size.

Comparison Of Internet Usage	*T*-Value
SIZE 1 (1-9 employees) < SIZE 2 (10-19 employees)	1.95**
SIZE 2 (10-19 employees) < SIZE 3 (20-249 employees)	2.01**
SIZE 1 (1-9 employees) < SIZE 3 (20-249 employees	4.29****
* $p < 0.05$, one-tailed **** $p < 0.0005$, one-tailed	

Correlation between Overall Internet Usage and Industry Sector

Hypothesis 2: There is a significant correlation between Internet usage and industry sector.

Mohan-Neill (2004a) reported that eight out of nine industries reported 50 percent or greater use of the Internet for business activities. The following is the top industry ranking based on percent of firms in the industry reporting use of the Internet for business activities (Table 6): 1-Financial Services (86 percent of firms use Internet for business activities); 2-Communications (79 percent); 3-Manufacturing (72 percent); 4-Construction (61 percent); 5-Transportation (59 percent); 6-Services (58 percent); 7-Retail (50 percent), and 8-Agriculture (50 percent). Only one out of nine industries reported less than 50 percent use of the Internet for business activities. It is the Wholesale sector (48 percent).

The two top groups using the Internet are niche sectors. Financial Services reported 86 percent Internet usage and it comprised about 4 percent of the overall sample. Communications reported 79 percent Internet usage and it comprised about 2 percent of the overall sample. The top two sectors in terms of size reported modest Internet usage, Services (41 percent of sample) had 58 percent usage and Retail (22 percent of sample) reported on 50 percent Internet usage. Manufacturing (72 percent) and Construction (61 percent) reported higher usage than Services and Retail (Table 6). Differences between sectors are tested for statistical significance in previous research (Mohan-Neill 2004a). There are some statistical differences between sectors (Hypothesis 2).

Table 6. Internet Usage based on Industry Sector			
Industry	Number of Firms in Sector	Percent Internet Usage	Rank by Internet Usage
Financial Services	29	86	1
Communications	14	79	2
Manufacturing	60	72	3
Construction	76	61	4
Transportation	22	59	5
Services	312	58	6
Retail	169	50	7
Agriculture	18	50	7/8
Wholesale	25	48	9
Other	14	79	-
Refused	13	62	-
Total	752		-

Correlation between Overall Internet Usage and Firm's Sales Growth

Hypothesis 3: *Firms with the highest sales growth rate have higher Internet usage than firms with lower growth rates.*

Table 7 presents the quantitative data, which allow for statistical testing to determine whether the observed differences are significant. Recall from the sample profile that 18.1 percent of all firms have increased sales volume by 30 percent or more (SGR1). As shown in Table 7, it is reported that 66.9 percent of those firms in SGR1 use the Internet compared to 57.9 percent SGR2 firms, 57.5 percent of SGR3 firms, 58.8 percent of SGR4 firms and 47.4 percent of SGR5 firms. Table 7 also presents the *t-test* results for statistical differences in Internet usage based on sales growth rate of firms (Hypothesis 3). When the difference in Internet usage is compared between SGR1 firms and the other growth categories, it is observed that there are statistical significant differences (Table 7). The results show that SGR1 firms (firms with 30 percent or more sales growth) have significantly higher Internet usage than SGR2 firms ($t=1.4, p<0.10$), SGR3 firms ($t=1.7, p<0.05$), SGR4 firms ($t=1.5, p<0.10$), and SGR5 firms ($t=2.5, p<0.01$). Also, when Internet usage of SGR1 firms is compared to the usage of firms in the overall sample, it is significantly higher ($t=1.8, p<0.05$). So there is a significant, positive correlation between sales growth rate and Internet usage. Firms with the highest sales growth rate have significantly higher Internet usage than lower growth rate firms. The most significant difference in Internet usage is between SGR1 (firms with 30 percent or more sales growth) and SGR5 (firms whose sales growth decreased by 10 percent or more). There is a

16.5 percent difference in Internet usage between SGR1 and SGR5 firms (*t=2.5, p<0.01*). There is statistical support for Hypothesis 3.

Table 7. Comparison of Internet Usage between the Highest Sales Growth Category and Other Growth Categories

Sales Growth Category (SGR)	Number of Firms	Percent Internet Usage	Compare SGR1 with other categories (t-value)
Increased by 30 Percent or more (SGR1)	139	66.9	-
Increased by 20 to 29 Percent (SGR2)	95	57.9	1.40*
Increased by 10 to 19 Percent (SGR3)	181	57.5	1.70**
Changed less than 10 Percent one way or the other (SGR4)	170	58.8	1.50*
Decreased by 10 Percent or more (SGR5)	57	47.4	2.50***
Don't know	63	60.3	-
Refused	47	57.4	-
TOTAL FIRMS	752	59.0	1.80**

* $p < 0.10$, one-tailed ** $p < 0.05$, one-tailed *** $p < 0.01$, one-tailed

Correlation between Online Market Scanning and Firm Size

Hypothesis 4: Larger firms (firms with more employees) have higher OMIESA than smaller firms.

Figure 4 illustrates graphically the relationship between Firm size and OMIESA. The group with the smallest firms, SIZE 1 had 40.3 percent firms reporting OMIESA. The larger firms in SIZE 2 had 50.5 percent of their firms reporting OMIESA. SIZE 3 (with the largest firms) had 61.0 percent of their firms reporting OMIESA. The overall sample reported 48.5 percent of its first conducted OMIESA or online market information scanning activity (Table 8).

Table 9 presents the results for statistical significance tests for Hypothesis 4. In all cases, it appears that a greater percent of larger firms used the Internet for OMIESA. However, the relative significance between groups differs in the magnitude of the statistical significance (Table 10). SIZE 2 firms (group with 10-19 employees) have a higher overall percent OMIESA than firms with 1-9 employees, in the SIZE 1 group (*t=2.31, p<0.05*). SIZE 3 firms (group with 20-249 employees) have a higher overall percent OMIESA than SIZE 2 firms (*t=2.13, p<0.05*).). SIZE 3 firms (group with 20-249 employees) have a higher overall percent OMIESA than SIZE 1 firms (*t=4.77, p<0.0005*). So the most significant difference is between the smallest and largest firms, and there is support for Hypothesis 4.

Figure 4. Cross-Tab between Firm Size and OMIESA[a]

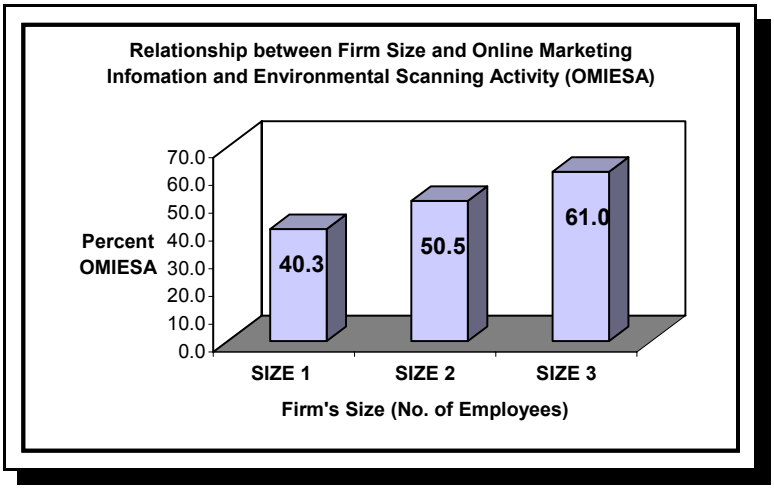


Table 8. OMIESAa Comparison Based on Firm Size.			
Firm Size	**Number Of Firms**	**Firms Conducting OMIESA[a]**	**Percent OMIESA**
SIZE 1 (1-9 employees)	352	142	40.3
SIZE 2 (10-19 employees)	200	101	50.5
SIZE 3 (20-249 employees)	20	122	61.0
Total Firms	752	365	48.5
[a] Online Market Information and Environmental Scanning Activity (OMIESA)			

Table 9. T-test for Statistical Differences in OMIESAa based on Firm Size.	
Comparison of OMIESA[a] Based On Firm's Size	*T*-VALUE
SIZE 1 (1-9 employees) < SIZE 2 (10-19 employees)	2.31**
SIZE 2 (10-19 employees) < SIZE 3 (20-249 employees)	2.13**
SIZE 1 (1-9 employees) < SIZE 3 (20-249 employees	4.77****
** $p < 0.05$, one-tailed **** $p < 0.0005$, one-tailed [a] Online Market Information and Environmental Scanning Activity (OMIESA)	

These results are consistent with previous studies, which show positive correlation between firm size and traditional environmental scanning activities by firms (Mohan-Neill 1995; Strandholm and Kumar 2003). For example, firms with more employees are also more likely to do database research ($p < 0.10$) (Mohan-Neill 1995). It is also consistent with the positive correlation between

firm size and overall Internet usage discussed earlier in this study. However, based on the *t-tests*, one can conclude that the correlation between Firm size and OMIESA is stronger than that between Firm size and overall Internet usage. In other words, firm size matters more for OMIESA than Internet usage even though overall Internet usage is greater than OMIESA. This may be due to the fact that OMIESA is a research activity and it requires a greater level of sophistication and effort than overall Internet usage (which includes activities such as email).

Correlation between Market Scanning and Industry Sector

Hypothesis 5: There is a significant correlation between OMIESA of firms and Industry sector.

Table 10 shows the percent of firms conducting online market information and environmental scanning activity (OMIESA) in each industry sector. It is sorted and ranked based on the percent conducting OMIESA. Six out of nine industries report 50 percent or greater use of the Internet for OMIESA. The following is the industry ranking based on percent of firms in the industry sector reporting use of the Internet for OMIESA: First -Financial Services (69.0 percent of firms in sector); Second -Communications (64.3 percent); Third - Transportation (59.1 percent); Fourth - Manufacturing (58.3 percent); Fifth - Construction (51.3 percent); and Sixth - Agriculture (50.0 percent). The bottom three sectors are seventh - Retail (46.2 percent); Eighth - Services (44.9 percent) and Ninth - Wholesale (32.0 percent).

The two top groups using the Internet for OMIESA are niche sectors (Table 10). Financial Services is ranked first in OMIESA but as a sector, it comprised about 4 percent of the overall sample. Communications is second, and it comprised about 2 percent of the overall sample. The two largest sectors in terms of size reported modest OMIESA, Services is ranked eighth (it is 41 percent of sample) and Retail ranked seventh (it is 22 percent of sample).

Two series of comparisons were conducted to test for significant differences in OMIESA based on industry sector (Hypothesis 5). The first series of comparisons is between OMIESA in Financial Services and other sectors. Financial Services firms had a significantly higher frequency of OMIESA than Construction firms *($t= 1.7, p<0.05$)*, Wholesale firms *($t=2.9, p< 0.005$)*, Retail (*$t=2.4, p<0.01$*), Services (t=2.7; p<0.005) and Agriculture (*$t=1.3, p<0.10$*).

The second series of comparisons is between OMIESA of all firms in the sample to individual industry sectors. The average OMIESA for the entire sample is 48.5 percent. Financial Services have a higher frequency of OMIESA than the overall sample (*$t= 2.30, p<0.05$*), and manufacturing firms also have a higher frequency than the sample *($t=1.50, p<0.10$)*. Firms in the Wholesale sector have a lower OMIESA than the sample (*$t=-1.7, p<0.05$*). There is statistical support for Hypothesis 5.

Table 10. OMIESAa based on Industry Sector (Sorted by Relative Frequency).					
Industry Sector	Number of Firms in Sector	Internet Users	Number of Firms conducting OMIESA[a]	OMIESA[a] Percent	Rank
Financial services	29	25	20	69.0	1
Communications	14	11	9	64.3	2
Transportation	22	13	13	59.1	3
Manufacturing	60	43	35	58.3	4
Construction	76	46	39	51.3	5
Agriculture	18	9	9	50.0	6
Retail	169	84	78	46.2	7
Services	312	182	140	44.9	8
Wholesale	25	12	8	32.0	9
Other	14	11	10	71.4	-
Refused	13	8	4	30.8	-
Total Firms	752	444	365	48.5	
[a] Online Market Information and Environmental Scanning Activity (OMIESA)					

Correlation between OMIESA and Firm's Sales Growth Rate (SGR)

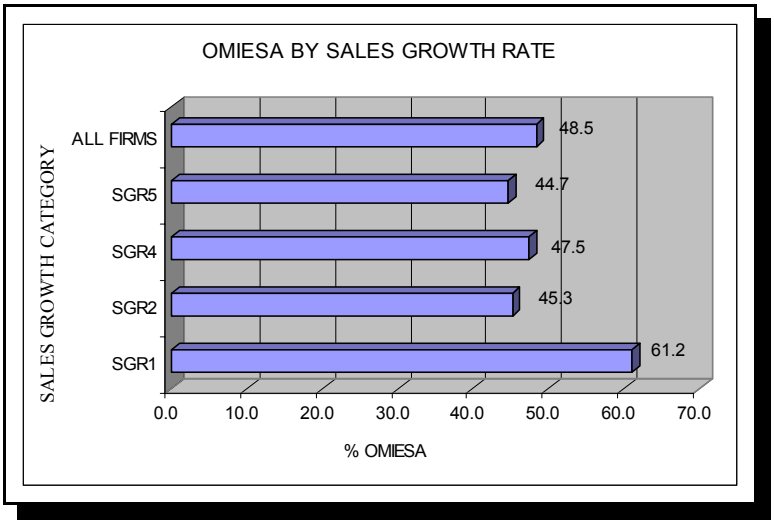
Hypothesis 6: Firms with the highest sales growth rate have higher OMIESA than firms with lower growth rates.

Figure 5 is a graphic illustration of the relationship between OMIESA and a firm's sales growth. The highest sales growth firms appear to have the highest OMIESA. Table 11 presents the distribution of firms in various growth categories SGR_i and the percent of firms in each category, which conduct OMIESA. Recall from the sample profile that 18.1 percent of all firms have increased sales volume by 30 percent or more (SGR1). According to Table 12, 61.2 percent of those firms in SGR1 conducted OMIESA compared to 45.3 percent SGR2 firms, 47.5 percent of SGR3 firms, 44.7 percent of SGR4 firms and 45.6 percent of SGR5 firms. The average frequency of OMIESA for the total sample is 48.5 percent.

Table 11 also presents the *t-test* results for statistical differences in OMIESA based on sales growth rate of firms (Hypothesis 6). When the difference in OMIESA is compared between SGR1 firms and the other growth categories, it is observed that there are statistically significant differences (Table 11). The results show that SGR1 firms (firms with 30 percent or more sales growth) have significantly higher OMIESA than SGR2 firms ($t=2.4, p<0.01$), SGR3 firms ($t=2.5, p<0.01$), SGR4 firms ($t=2.9, p<0.005$), and SGR5 firms ($t=2.0, p<0.05$). Also, when OMIESA of SGR1 firms are

compared to the OMIESA of the overall sample, it is significantly higher ($t=2.8, p<0.005$). So there is a significant, positive correlation between sales growth rate and OMIESA. Firms with the highest sales growth rate have significantly higher OMIESA than lower growth rate firms. So, a firm's OMIESA rate is positively correlated to its sales growth.

Figure 5. OMIESA[a] and Sales Growth Category[b]



[a] Online Market Information and Environmental Scanning Activity (OMIESA)
[b] SGR1 is the highest Sales Growth Category (30 percent or more sales growth)

Table 11. Comparison of OMIESAa between the Highest Sales Growth and Other Growth Categories.

Sales Growth Rate Category (SGR)	Number of Firms	OMIESA[a] Percent	Compare to SGR1 to other Categories t-value
Increased by 30 Percent or more (SGR1)	139	61.2	
Increased by 20 to 29 Percent (SGR2)	95	45.3	2.4***
Increased by 10 to 19 Percent (SGR3)	181	47.5	2.5***
Changed less than 10 Percent one way or the other (SGR4)	170	44.7	2.9****
Decreased by 10 Percent or more (SGR5)	57	45.6	2.0**
Don't know	63	47.6	
Refused	47	40.4	
Total Firms	752	48.5	2.8****

** $p < 0.05$, one-tailed *** $p < 0.01$, one-tailed **** $p < 0.005$, one-tailed
[a] Online Market Information and Environmental Scanning Activity (OMIESA)

CONCLUSION

The owner/manager (A) needs marketplace information to make more informed and consequently better decision for business planning. However, often the problem is not the lack of information in the environment, but an overload of information combined with limited resources within A to adequately process and utilize the relevant information. The characteristics of A, in terms of strengths and weaknesses, will have a significant impact on the quality of the information acquired and thus on the quality of the subsequent business decisions. The primary objective of this paper is to add to our understanding of how small businesses continue to adapt to a rapidly changing competitive environment. Specifically it explores how small businesses are utilizing new technology, like the Internet to enhance their online market information and environmental scanning activity, defined as OMIESA in this study. It analyzes the correlation between firm's characteristics (firm's size, industry sector, and firm's sales growth rate) with (1) the firm's use of the Internet, and (2) specifically its online information acquisition activity, OMIESA.

Relationship between Firm's Characteristics and Overall Internet Usage

The results reveal a positive correlation between Internet usage and firm size (based on number of employees). Larger firms use the Internet more than smaller firms. There is also correlation between industry sectors. Niche sectors such as Financial services and Communications have higher Internet usage than larger industry sectors such as Services and Retail. A positive and significant correlation is also observed between Internet usage and the firm's sales growth. Firms with 30 percent or more increase in sales volume have significantly higher Internet usage than firms with lower growth rates. There is no significant correlation between Internet usage and region of country or home-based status of firms.

Relationship between Firm's Characteristics and Market Scanning

The results reveal a positive correlation between online information acquisition such as OMIESA and firm size (based on number of employees). Larger firms conduct more OMIESA than smaller firms. There is also correlation based on industry sectors. Niche sectors such as Financial services and Communications conduct more OMIESA than larger industry sectors such as Services and Retail. A positive and significant correlation is also observed between OMIESA the firm's sales growth. Firms with 30 percent or more increase in sales volume conduct significantly higher OMIESA that firms with lower growth rates.

Implications of General Findings

The strength of the findings is enhanced by the quality of the sample and the data. This study utilized data from a national stratified random sample of 752 firms. A professional executive interviewing service provided by Gallup collected the data. Therefore, the current findings may be have more external validity than results from smaller and less random samples.

The overall research objective of this article is to evaluate the influence of a firm's internal environment or characteristics on its online market information acquisition activities, defined as OMIESA in this study. In previous studies (Brush 1992; Daft and Weick 1984; Mohan-Neill 1995) the data collection methods are categorized as either formal (for example, survey) or informal (for example reading a periodical). It was also suggested by Mohan-Neill (1995) that formal methods of data collection are more likely to provide immediate marketplace information (for example, info on customer needs) for immediate decision-making, while informal methods are more likely to provide remote marketplace (for example, info on industry trends), which may influence more long-term strategic planning by firms. What is interesting about online data collection, which is classified as an "informal" method in this paper, is the fact that Internet technology can provide both immediate and remote marketplace information. This illustrates how businesses can utilize technology to get information for better decision-making, and ultimately to increase productivity.

The observed correlation of Internet usage and OMIESA with firm size reinforces previous research on marketing scanning and firm size (Mohan-Neill 1995). The notion that size (more employees) is a proxy for more resources to conduct information acquisition is still valid. The correlation of Internet usage and OMIESA with industry sector also makes sense, since industry sector represents elements of both the firm's internal and external environment. The most compelling results are the correlation between the firm's sales growth and (1) overall Internet usage, and (2) OMIESA. The highest sales growth rate firms had (1) the highest frequency of Internet usage and (2) the highest frequency of online market information scanning or OMIESA. So, if we consider sales growth as a measure of a firm's success, both Internet usage and online market information scanning or OMIESA are highly correlated to a firm's success.

Future Research

The fundamental question in this research stream is what factors influence the use of technology by small business? The specific research issues relate to exploring which variables influence a firm's use of technology and online resources, and what is their relative significance? This study evaluated the relative influence of firm characteristics on Internet usage and market scanning. The next study should evaluate the influence of owner's characteristics (for example, gender and education) and firm's age on market scanning?

Additional research should explore other measures of technology usage by firms, such as the presence of a firm's website? What is the influence and correlation of firm's characteristics on the firm's having its own website? What inhibits a firm from having a website? What are the uses of the website? Is it correlated to measures of success like sales growth?

If entrepreneurial firms are "the driving force in the U.S. economy," it is critical that these issues be addressed so we can understand how firms are utilizing and incorporating Internet technology in order to survive and succeed in a rapidly changing competitive environment.

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INFLUENCES ON AN ENTREPRENEUR'S PERCEIVED RISK: THE ROLE OF MAGNITUDE, LIKELIHOOD, AND RISK PROPENSITY

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ABSTRACT

This study makes a contribution to the existing literature on entrepreneurial risk perception. A model is developed and tested to capture how entrepreneurs perceive the risk associated with new business ventures. Two variables are examined to assess the entrepreneur's perception of the "magnitude" of risk, and another variable captures the "likelihood" of loss associated with the new business. The individual's prior disposition, referred to here as "risk propensity," is tested for influence on the magnitude and likelihood factors. The research results confirm the roles of the likelihood of losing money on a new venture and the size of the potential loss in determining how much risk the entrepreneur perceives in a new venture.

These research findings suggest that in order to reduce perceived risk among perspective entrepreneurs, two issues must be addressed. First, it is important to provide information that assures the entrepreneur that issues that can adversely affect the outcome of the new business venture have adequate contingency plans. Second, raising and allocating capital in stages, rather than the entire amount up front, will reduce the perceived risk in the eyes of the entrepreneur.

INTRODUCTION

The literature on entrepreneurial risky decision-making has evolved dramatically over the last decade. Early studies on entrepreneurship evoked the premise that entrepreneurs were de facto risk seekers who pursued business opportunities others deemed too risky. More recently, cognitive differences involving biases and heuristics have been shown to affect the perception, rather than the propensity, of entrepreneurs in assessing the risk of new business ventures (Palich and Bagby 1995; Simon, Houghton and Aquino 1999).

The role of risk in entrepreneurship is important to study not only at the individual level to find ways to create risk reduction strategies, but also at a macro level in understanding similarities and differences across cultures or economies. Variances in both management style (Bjerke 2000)

and operational strategy (Sum, Kow, and Chen 2004) among entrepreneurs from different cultures and nations have been recognized. Considering risk perceptions, Asian entrepreneurs are generally considered to be more risk-averse than entrepreneurs in Western nations (Bjerke 2000). Some research does suggest, however, that entrepreneurs share certain inherent traits despite differences in culture and nationality (McGrath and MacMillan 1992). While some aspects of risk perception may be part of the predisposition of the individual or influenced by the culture, the environmental context of the economy may also play a role. Tan (2002) for example, found that mainland Chinese exhibited a higher level of willingness to take risks than Chinese Americans or Caucasian Americans. He posited that they need to take a higher level of risk when starting a new venture due to the harsh governmental restraints they face.

The research stream of risk perception in entrepreneurs, its antecedents, and its consequences continues to develop. Classic decision theory has been the starting point for researchers in identifying and validating direct influences on perceived risk. The venture related variables – likelihood and magnitude – have emerged as important influences on the perception of the risk in a new venture. Likelihood of loss is defined as the probability that a new venture's financial outcome will be less than expected. Magnitude of loss refers to the absolute and relative amount of wealth loss that would result from the new venture failing. Likelihood of loss as a factor influencing new venture risk is most firmly supported in the classic decision theory and economics literature, while magnitude of loss became apparent in research specifically focused on business decision-making (March and Shapira 1987).

The individual entrepreneur's inclination to take risks has also been identified as an influence on risk perception. This factor is known as risk propensity, and research has produced conflicting findings on just how its influence on new venture risk perception occurs. Some studies indicated a negative correlation between the two variables (Sitkin and Weingart 1995), while others found no significant relationship (Forlani and Mullins 2000). Risk propensity has also been presented as a moderating influence on the relationships between inherent risk related venture characteristics and the individual's risk perception (Forlani, Mullins, and Walker 2002). Most recently, in an experimental situation, risk perception influenced choices that had differences in magnitude, but the individuals' risk propensity had more influence on ventures differing in likelihood (Mullins and Forlani 2005).

The purpose of this study is to integrate and extend the body of knowledge developed to this point regarding entrepreneurs' perceptions of new venture risk, and the role individual traits may play in influencing that perception. A model is developed that incorporates two tangible variables, magnitude of potential loss and magnitude of relative investment, together with the intangible variable, likelihood of loss. The factors are modeled as direct influences on the risk an entrepreneur perceives in a venture, with the individual trait, the entrepreneur's personal risk propensity, hypothesized as a variable that moderates the amount of risk they perceive.

CONTRIBUTIONS TO EXISTING LITERATURE

Our paper contributes to the entrepreneurial decision-making literature in several ways. First, we integrate existing risk perception theory by providing evidence of the generalizability of Forlani and Mullins' (2000) work, further demonstrating the influence of both likelihood and magnitude on entrepreneurial risk perception. Second, we extend existing research on magnitude by empirically testing *relative* level of investment, which is one aspect of magnitude, as a direct influence on risk perception. While level of investment was part of the Forlani and Mullins (2000) conceptual model, in their study it was not operationalized or empirically tested. The results of this analysis lead us to introduce an alternative model, which demonstrates the mediating influence of potential loss in the relationship between relative level of investment and perceived risk. Third, we extend the research begun by Forlani, Mullins, and Walker (2002) and further developed by Mullins and Forlani (2005) in an experimental setting on the moderating role of risk propensity in the likelihood – risk perception and magnitude – risk perception relationships. Fourth, and finally, we utilize structural equation modeling (SEM) for our analysis, which has several advantages over the simple correlation and multiple regression techniques. SEM provides a comprehensive way to assess and modify theoretical *causal* models (Bollen 1989). With SEM, direct, indirect, and total effects between variables can be assessed within one analysis, which allows for a more complete understanding of how all variables in a model relate to one another in individual relationships, and their combined effect on the final outcome variable(s).

In addition, our model is applicable to entrepreneurs from various cultural and national backgrounds. Considering the enormous impact entrepreneurial activity can have on a developing economy, it is important to consider the roles of likelihood, magnitude, and risk propensity in the risk perceptions of entrepreneurs in such countries. Recent research findings indicate risk propensity (or at least the willingness to take risks) may be more dependent upon national (i.e. environmental) than cultural factors. Considering likelihood and magnitude, one could speculate that both variables could be affected by environmental context as well. For likelihood, a harsher, more uncertain political and business environment could be expected to increase an entrepreneur's concerns that a venture will not reach its expected level of return. In regard to magnitude, while the actual amount the entrepreneur could lose may not be large in comparison with some new ventures undertaken by entrepreneurs in more developed countries, the amount of capital required relative to the net worth of the new entrepreneur may be quite large. Relative level of investment is considered to be another dimension of magnitude (Yates and Stone 1992), and we incorporate this aspect of the magnitude construct in our model in the following sections. Lack of government support programs for entrepreneurs would only increase the risk associated with this relative level of investment.

BACKGROUND

Modern business lore holds out successful entrepreneurs as risk-loving gamblers with no fear of "rolling the dice" regarding new business ventures. Within the professional literature on managerial behavior, however, the evidence is somewhat different. Within an entrepreneurial context, when defining risk, most would agree that risk is a multidimensional concept. Yates and Stone (1992) focus on three underlying dimensions relating to potential loss: 1) the amount of the loss, 2) the importance of the loss to the individual, and 3) the uncertainty of realizing the loss. Sitkin and Pablo (1992) posited a new model of risk behavior, which holds that three characteristics inherent in the individual play major influences on risky decisions: personal risk preferences, personal risk perceptions, and personal risk propensity. Risk preference depends on the motivation for achievement or desire to avoid failure on the part of the decision-maker. Risk perception or "perceived risk" involves the assessment by the decision-maker of the inherent risk in a new situation or venture. Risk propensity is concerned with the individual's risk-taking tendencies, such as risk seeking versus risk averse behavior. Sitkin and Pablo (1992) conclude that decision-makers' risk behavior will be consistent with their risk propensities, and the higher the level of perceived risk, the stronger the association between the two factors. Additionally, Mullins and Forlani (2005) found that there may be differences in risk behavior among entrepreneurs depending on whether they are risking their own money or capital obtained from others.

Based on the original relationship presented by Yates and Stone (1992), Forlani and Mullins (2000) studied characteristics of a particular decision which would lead an entrepreneurial decision maker to perceive varying levels of risk in a potential new venture. In other words, which aspects of a new venture proposition lead an entrepreneur to perceive a venture as more/less risky, which then influences the entrepreneur's new venture choice. Forlani and Mullins focused on two variables, one objective and one subjective that affect risk perception. The likelihood variable, which has also been referred to in other studies as variability, represents the probability that the actual outcome will deviate from the outcome that is desired (Armour and Teese 1978). This aspect of risk is inherent in any venture decision and represents the possibility that an expected level of return will not be achieved. As explained by Forlani and Mullins, a decision made under pre-existing conditions allows likelihood to be assessed in a more objective manner, such as calculating standard deviations of an investment's historical returns. New venture decisions, however, do not have historical returns to assess. Thus, the likelihood variable is more subjective in entrepreneurial decisions although various procedures have been developed to assess it, such as sensitivity analysis (Timmons 1999).

The second variable, "magnitude," relates to the work of March and Shapira (1987) on "hazard." Magnitude is a tangible variable that is inherent in the venture decision, representing the amount the entrepreneur will lose if things do not go as anticipated. As they conceptualize

magnitude, March and Shapira (1987) point out that amount of loss is not a probability distribution but rather is a finite estimate of the result of the worst possible outcome.

Forlani and Mullins' (2000) study provides empirical evidence of both magnitude and likelihood as direct influences on perceived risk. Their study, however, is based upon a methodology that places CEO's in an experimental setting. While these research findings are useful, the weakness relative to drawing conclusions about entrepreneurship is that their methodology does not focus on a sample of entrepreneurs who make decisions about their own entrepreneurial pursuits. More recently, in an experimental study conducted by Mullins and Forlani (2005), additional insights are gained with a potential typology of four combinations of high/low likelihood/magnitude. Based on their research, it would appear that various combinations of likelihood/magnitude elicit different behavior patterns as entrepreneurs approach risk related decisions.

While research developed thus far regarding risk decisions in business situations demonstrates the influence of both magnitude and likelihood, there is less evidence of the effect of risk propensity on perceptions of risk. Research regarding the relation between risk propensity and risk perception began with Palich and Bagby (1995) who challenged the notion of the entrepreneur as riverboat gambler and used a categorization theory to frame the decision process used by entrepreneurs. Categorization theory holds that decision-makers confronted with large amounts of information use cognitive heuristics. Heuristics are "rules of thumb" or mental shortcuts used to help store and process information efficiently. The authors proposed that, rather than having a higher propensity for undertaking risky ventures, entrepreneurs may instead have a lower level of risk perception. The use of heuristics in assessing new ventures can lead to higher levels of optimism and lower levels of risk perception, thus predisposing the decision-maker towards entrepreneurial ventures. An empirical analysis indicated no significant difference in the risk propensity of entrepreneurs and non-entrepreneurs. However, using a SWOT analysis scenario, entrepreneurs did differ significantly across all categories in their assessment of a venture's strengths, weaknesses, opportunities and threats. The authors conclude that lower risk perception, and not higher risk propensity, explains why some individuals will start new ventures that others choose not to pursue.

Sitkin and Weingart (1995) specifically assessed the relation between risk propensity and risk perception in their study of risky decision behavior, focusing on outcome history and problem framing as key influences. Outcome history is the individual's prior personal experience involving previous risky decisions. Problem framing refers to an individual's assessment of the potential gains and losses from a risky decision. Their model holds that the direct effects of these influences on risky decision behavior are mediated by the individual's risk propensity and risk perception. The empirical results support the premise that outcome history significantly influences risk propensity, and that risk propensity is negatively correlated with risk perception.

Forlani and Mullins (2000) also hypothesized a negative relationship between risk propensity and risk perception. In conflict with Sitkin and Weingart's findings, however, these authors did not

find support for their hypothesis. A recent study of risk propensity and its role in risk perception was conducted by Forlani, Mullins, and Walker (2002). Although this study was conducted in a new product decision context, with managers as the sample, it provides insight into the more complicated role of risk propensity in risk perception than has previously been asserted. The authors hypothesized a moderating role for risk propensity in the relationships between likelihood, magnitude and risk perception. Specifically, risk propensity was hypothesized as a negative moderator in these relationships; thus, higher levels of risk propensity were believed to weaken the likelihood – risk perception and magnitude – risk perception relationships. According to their hypotheses, individuals with a higher propensity for risk do not perceive the same level of risk from likelihood and magnitude as an individual with a lower level of risk propensity. The individual trait – risk propensity – influences how venture related variables are perceived to affect risk.

While Forlani, Mullins, and Walker (2002) found a negative moderating effect from risk propensity in the relationship between likelihood and risk perception in the product decision context, their hypothesis regarding the effect of risk propensity on the magnitude and risk perception relationship was not supported. These results concur with the findings of Mullins and Forlani (2005) that risk propensity may only be influential in the relationship between likelihood and risk perception. Furthermore, a test considering the main effect between risk propensity and overall risk perceptions did not support a relationship between the two variables, which is consistent with the findings of Forlani and Mullins (2000).

To summarize, research that has been conducted to date demonstrates conflicting findings in the relationship between risk propensity and risk perceptions. To investigate this important influence on entrepreneurial decision-making, we propose and test a new model of influences on perceived risk.

MODEL AND HYPOTHESES

Although our understanding of entrepreneurial risky decision-making has advanced significantly over the last decade, gaps still remain in how new venture risk is assessed. Our model (see Figure 1) is intended to both integrate and extend existing theory. Likelihood and two dimensions of magnitude – relative level of investment and degree of potential loss – are hypothesized as direct influences on perceived level of risk. The direct influence hypotheses are based on relationships posited by Yates and Stone (1992) and operationalized by Forlani and Mullins (2000). Forlani and Mullins, however, only empirically tested the influence of likelihood and the magnitude of a proposed new venture's largest potential loss through an experimental design method. Additionally, the influence of relative level of investment, while presented as one aspect of magnitude in their theoretical model, was not tested in their study. In our model, however, relative level of investment is included, and risk propensity is hypothesized as a moderating factor

in the direct relationships between likelihood, relative level of investment, and degree of potential loss on perceived risk.

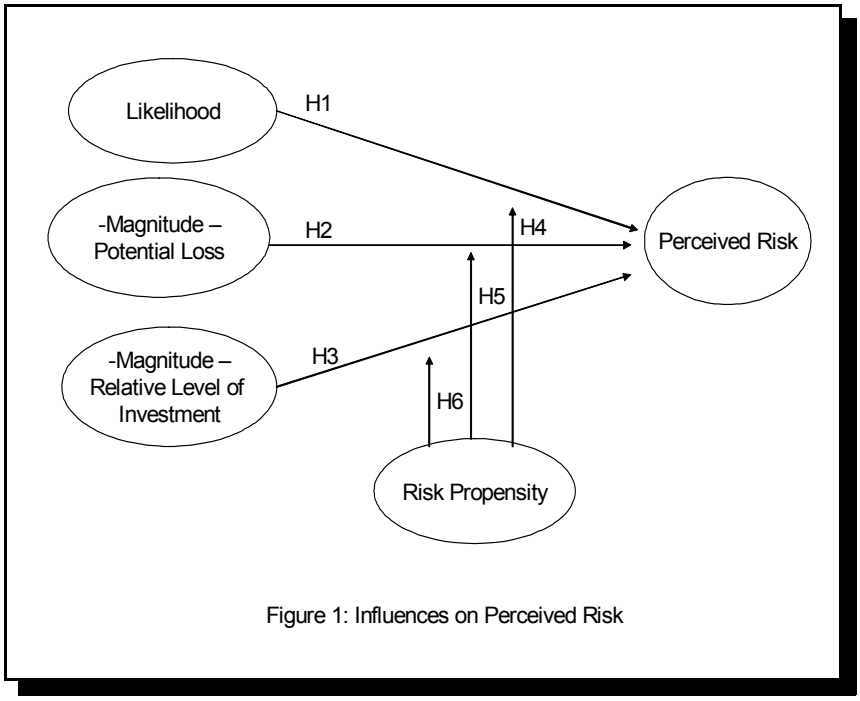

Figure 1: Influences on Perceived Risk

Of the three direct influences hypothesized in this study, "likelihood" is the most developed, with a firm research base in the economics literature (Armour and Teece 1978; Fisher and Hall 1969) and, relatedly, classical decision theory (March and Shapira 1987). The chance, or "likelihood" that an outcome will diverge from its anticipated or desired result has been applied in a broad range of situations, some of them more focused on new venture decisions. Previous research demonstrates likelihood as a significant influence on perceived risk. Thus:

H1: The greater the likelihood of failure in predicted outcomes of a new venture, the greater will be the entrepreneur's perceived risk in the new venture.

The variable "magnitude of potential loss" has also been studied numerous times. It was initially identified by March and Shapira (1987) who studied risk perceptions by managers in a business environment. Since then both theoretical and empirical support has been given for a positive relationship between magnitude of potential loss and perceived risk (Yates and Stone 1992; Forlani and Mullins 2000; Forlani, Mullins, and Walker 2002; Mullins and Forlani 2005). Thus:

H2: The greater the magnitude of a new venture's potential loss as assessed by the entrepreneur, the greater will be the entrepreneur's perceived risk in the new venture.

Another dimension of magnitude, relative investment in the new venture, is based on Yates and Stone's (1992) description of the elements of risk involving losses, the significance of those losses, and the uncertainty surrounding the potential for gain or loss. The relevant aspect of Yates and Stone's theory for the relative investment construct is "significance," more specifically, the subjectivity surrounding the significance of potential loss. As explained by the authors, the same potential outcome can be viewed either positively or negatively, depending on the circumstances faced by each individual. A relative loss for one individual can actually be perceived as a gain for another. Similarly, the degree of loss perceived even with the same outcome can differ between individuals dependent on their personal situation. According to Forlani and Mullins (2000), greater investments limit opportunities for investing in other ventures and increase the amount there is to lose on each venture; thus, influencing perceived risk. In our model, we have anchored the individual's perception of their investment relative to the assets they have available for investing, labeling our construct *relative* level of investment. There is a relative risk aspect to each new venture decision that is dependent upon the amount of capital required relative to the net worth of the entrepreneur. The same amount of capital may be either a large or small investment for each individual entrepreneur, depending on their personal financial situation. How each entrepreneur views the amount of investment required, relative to his situation, will influence his level of perceived risk associated with the new venture. Hence:

H3: The greater the magnitude of the relative level of investment required for a new venture as perceived by the entrepreneur, the greater will be the entrepreneur's perceived risk in the new venture.

The conflicting research results regarding a direct relationship between risk propensity and risk perception indicate the possibility of a more complex association between the two variables. Forlani, Mullins, and Walker's (2002) study provides evidence of a moderating effect of risk propensity on the relationship between venture-related variables and risk perception. Thus, the individual trait – risk propensity – influences how one perceives the risk associated with more measurable risk-related variables of a new venture decision – likelihood, magnitude of potential loss, and magnitude of the relative investment. While Forlani, Mullins, and Walker only found support for a negative moderating effect of risk propensity in the relationship between likelihood and risk perception, they only included one measure of magnitude (potential loss) and they conducted their study among product managers. Among entrepreneurs we hypothesize that risk propensity acts as a negative moderator, so that a higher level of risk propensity will attenuate the relationship in all three direct influences on perceived risk. Thus:

H4: Risk propensity negatively moderates the relationship between an entrepreneur's assessed likelihood of failure in predicted outcomes of a new venture and the entrepreneur's perceived risk in the new venture.

H5: Risk propensity negatively moderates the relationship between the magnitude of potential loss associated with a new venture and the entrepreneur's perceived risk in the new venture.

H6: Risk propensity negatively moderates the relationship between the magnitude of the relative level of investment associated with a new venture and the entrepreneur's perceived risk in the new venture.

DATA COLLECTION AND METHODOLOGY

The data were collected using a questionnaire mailed to 3,574 persons identified as having applied for new business licenses in a metropolitan area which is located near the borders of three Southeastern states. These licenses are required of all new businesses, as well as those who change ownership or the form of their organization (e.g., partnership changed to an S-corporation). The data collection procedure included a postcard alerting the respondents to the forthcoming survey, and two subsequent mailings of the survey instrument. A total of 430 responses were received, for an overall response rate of 12 percent. Consistent with the objective of focusing exclusively on the attributes and characteristics of actual recent entrepreneurs, acceptable respondents for the sample were limited to those who actually started a business in the preceding five years. This resulted in 304 usable responses.

The survey instrument was designed to build on the existing literature in entrepreneurial decision-making. Measures were drawn from both studies of entrepreneurs and studies comparing entrepreneurs and managers. Variables tested in the research include risk propensity, risk perception, likelihood of failure in potential outcomes, magnitude/degree of potential loss, and magnitude/relative level of investment.

Three items that used a seven-point scale were used to measure perceived new venture risk. As an example, respondents were asked to rate the risk associated with starting their business venture from "minimal" to "extreme". The other items used the same terminology, or scale anchors as Forlani and Mullins (2000), "very risky/not risky" and "high/low."

Risk propensity was measured from responses to a series of alternative choices respondents made comparing certain outcomes versus uncertain outcomes with stated probabilities. This scale was operationalized using an adaptation of the Risk Style Scale developed by Schneider and Lopes (1986). This measure is particularly appropriate for this study because it focuses on personal propensities toward financial risk. While the expected value of each option was the same, respondents who chose risk over certainty were scored as more prone to risk.

Each of these constructs was measured using a single item four point scale. Magnitude/relative level of investment was measured by asking respondents to express their level of investment compared to their net worth. Choices were identified as percentage quartiles (<25%, 25-50%, etc.). Similar quartiles were used in a "probability that your business will fail" item to

measure likelihood of failure in potential outcomes. The magnitude/degree of potential loss measure offered a qualitative assessment, ranging from "no significant financial consequences" to "very substantial financial consequences."

The data were analyzed using the structural equations modeling (SEM) technique in LISREL 8.50 (Jöreskog and Sörbom 2001). SEM involves the measurement of independent and dependent observed variables, which are used to define independent and dependent latent variables that cannot be directly measured (Schumacker and Lomax 1996). As explained by Bollen (1989), the SEM technique encompasses and extends regression, econometric, and factor analysis procedures. Unlike multiple regression or analysis of variance, SEM analyses are based on covariances rather than cases. The purpose of the technique is to minimize the difference between the sample covariances and the covariances predicted by the model. Thus, the covariance structure hypothesis is:

$\Sigma =$ $\Sigma(\theta)$, *where*
$\Sigma =$ *the population covariance matrix of observed variables*
$\theta =$ *vector that contains the model parameters*
$\Sigma(\theta) =$ *predicted model covariance matrix written as a function of* θ

Σ and $\Sigma(\theta)$ represent population parameters and thus are unattainable, so their sample representatives are used. In the analysis, overall fit measures assess the departure of Σ from $\Sigma(\theta)$. The primary question, then, is to what degree does the true model diverge from the model being tested? Schumacker and Lomax (1996) provide a thorough description of SEM assessment criteria. As explained by the authors, assessing model fit in SEM is not as straightforward as it is in other multivariable statistical approaches. There is no single test of fit, and in fact it is recommended that multiple goodness-of-fit criteria be used in conjunction with one another. Model fit criteria commonly used include chi-square (χ^2), goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), and root-mean-square-error-of-approximation (RMSEA).

A significant χ^2 value relative to the degrees of freedom indicates the observed and estimated matrices differ. Thus, a non-significant χ^2 infers that the data fit the model; however, there is always the possibility that other models exist that fit the data as well. For this reason, we use other measures to assess model fit in addition to the χ^2. The GFI measures the amount of variance and covariance in the observed matrix and the matrix implied by the model. The GFI index ranges from 0 (no fit) to 1 (perfect fit), with a value close to .90 reflecting a good fit. The AGFI adjusts the GFI index for the degrees of freedom of a model relative to the number of variables. The AGFI also ranges from 0 (no fit) to 1 (perfect fit), with a value close to .90 reflecting a good fit. The RMSEA corrects for the tendency of the χ^2 statistic to reject any specified model with a sufficiently large sample and measures discrepancy per degree of freedom. An RMSEA value of .05 or below indicates a good model fit.

EMPIRICAL RESULTS

The measures were assessed for convergent, discriminant, and nomologic validity using the two-step approach (Anderson and Gerbing 1988). Under this method, convergent and discriminant validity are evaluated during the measurement model phase, while the structural model provides an appraisal of nomologic validity. The measurement model "specifies the relations of the observed measures to their posited underlying constructs, with the constructs allowed to intercorrelate freely. A confirmatory structural model then specifies the causal relations of the constructs to one another (Anderson and Gerbing 1988, p. 411)." Convergent validity is evaluated within the measurement model by assessing the loadings (λ) of the construct indicators, and by calculating composite reliability – the internal consistency of a measure – and variance extracted – the amount of variance captured by the construct in relation to the variance due to random error (Fornell and Larcker 1981). Composite reliability of at least .6 and average variance extracted of at least .5 are considered desirable (Bagozzi and Yi 1988). Discriminant validity is assessed by comparing the variance-extracted estimate to the square of the F matrix (Fornell and Larcker 1981). The F matrix assesses the correlation between constructs. Establishing discriminant validity – the ability of a measure not to correlate with measures of other variables or constructs – verifies the distinctiveness of each construct.

The input matrix for all analyses was the covariance matrix. Error terms for single item measures were estimated at .15, following the conventional recommended approach in SEM (Jöreskog and Sörbom 1993). Correlation estimates for all the constructs are displayed in Table 1. Pairwise deletion was used for all analyses.

Table 1: Correlation Estimates

		(1)	(2)	(3)	(4)
(1)	**Perceived Risk**	1.00			
(2)	**Likelihood**	* 0.169	1.00		
(3)	**Magnitude/Relative Level of Investment**	**0.216	- 0.029	1.00	
(4)	**Magnitude/Potential Loss**	**0.383	0.051	**0.382	1.00

Note: * Correlation is significant at the 0.05 level
** Correlation is significant at the 0.01 level

The measurement model exhibited strong levels of fit with $\chi^2_{(6)}$=7.10, p value = 0.31, GFI=.99, AGFI=.97, RMSEA=.025. The results of the measurement model analysis are provided in Table 2. Convergent validity was supported for perceived risk with the lowest parameter estimate being λ=.68 (t=12.91) for item 2 (See Table 2). Discriminant validity for perceived risk was

assessed by comparing the variance extracted estimate to the square of the F matrix. The variance extracted estimate was .66 (Appendix A) and exceeded the square of the F matrix (Fornell and Larcker 1981).

Table 2: Analysis of Measurement Model

Construct Measure	**Standardized l_x
Perceived Risk	
Item 1	.89
Item 2	.68
Item 3	.86
Composite Reliability = .85; Average Variance Extracted = .66	
* Likelihood (single item)	.86
* Magnitude/Relative Level of Investment (single item)	.91
* Magnitude/Potential Loss (single item)	.88

Note: * Error term fixed at 0.15

** Lambda (λ_x) can be interpreted as standardized partial regression coefficients used with an unweighted least-squares method of estimations. In a single unidimensional factor, the weights indicate the correlation between the observed (measured) variables and the single factor (latent variable) (Schumacker and Lomax 1996). In a multi-item construct, loadings closer to 1.00 indicate convergent validity.

The proposed structural model shown in Figure 1 was tested using the measures that resulted from the measurement model analysis. The structural model identifies direct influences on perceived risk. The results of this analysis are displayed in Table 3. The proposed structural model has a $\chi^2_{(6)} = 7.10$, p value = 0.31, GFI = .99, AGFI = .97, RMSEA = .025, which demonstrates acceptable levels of fit. Hypotheses 1 through 3 concern the relationships between likelihood, magnitude/potential loss and magnitude/relative level of investment, and the outcome variable perceived risk (See Table 3). Hypotheses 1 and 2 are supported, while 3 is not. Considering these relationships, an entrepreneur's perceived risk in a new venture is directly and positively influenced by his/her assessed likelihood of its failure, and by the magnitude of his/her potential loss if the new venture fails. The magnitude of the entrepreneur's assessed relative level of investment in the new venture does not have a direct influence on perceived risk.

Hypotheses 4, 5, and 6 concern the moderating effect of risk propensity on the relationships between perceived risk and likelihood, potential loss, and relative level of investment. Multigroup analysis was used to assess the moderating variable effects on the structural model (Jöreskog and Sörbom 2001). The test is conducted in a two-step approach. First, the appropriate structural parameters are constrained to be equal across groups, thereby generating an estimated covariance matrix for each group and an overall χ^2 value for the sets of submodels as part of a single structural

system. Next, the parameter equality constraints are removed, resulting in a second χ^2 value with fewer degrees of freedom. The moderator effects are tested by assessing whether statistical differences exist between the two χ^2 values. If the change in the χ^2 value, typically a decrease, is statistically significant, the null hypothesis of parameter invariance is rejected and a moderator effect is indicated.

Table 3: Analysis of Structural Model

Hypothesis	From	To	Standardized Estimate	* t-value	Significance
H1	Likelihood	Perceived Risk	.31	3.04	Significant
H2	Magnitude/Potential Loss	Perceived Risk	.65	5.29	Significant
H3	Magnitude/Relative Level of Investment	Perceived Risk	.09	0.77	Not Significant

Note: * The t-value for a parameter is defined as the parameter estimate divided by its standard error. Parameters whose t-values are larger than two in magnitude are normally judged to be different from zero, i.e. significant.

A single risk propensity score was formed by summing the items in the measure. The higher the score, the higher the individual's propensity for risk, the lower the score, the lower his risk propensity. The sample was split into two groups based on the distribution of the respondents' summed score on the risk propensity variable. The distribution was assessed for a break point that clearly distinguished between respondents with high versus low risk propensity. Entrepreneurs with a risk propensity score of 5 or 6 were classified as low in risk propensity (n=178), while those with a total score of 7 through 10 were considered to be high in risk propensity (n=107).

Multigroup analysis was conducted considering both risk propensity groups. The results are displayed in Table 4. A significant difference in χ^2 ($\alpha = 0.10$) was found between groups for the path between likelihood and perceived risk. Thus, risk propensity moderates the relationship between likelihood and perceived risk. Focusing specifically on the parameter estimates (Table 5), the path between likelihood and perceived risk is significant in the low risk propensity group (t-value = 2.71), while a non-significant value is found in the high risk propensity group (t-value = 0.00). Therefore, individuals with a higher tolerance for risk do not perceive an increased risk in a new venture with an increase in their assessed likelihood of failure for the venture. Risk propensity acts as a negative moderator in the relationship between assessed likelihood of failure and perceived risk; hypothesis 4 is supported. A significant difference in χ^2 was not found, however, between groups for the paths between magnitude/potential loss and magnitude/relative level of investment and perceived risk. Thus, hypotheses 5 and 6 are not supported.

Table 4: c^2 Difference Test Moderating Variable: Risk Propensity			
Hypothesis	**Hypothesized Moderated Path**	*** Difference in c^2**	**Significance**
H4	Likelihood ® Perceived Risk	2.706	$\alpha = 0.10$
H5	Magnitude/Potential Loss ® Perceived Risk	0.03	N.S.
H6	Magnitude/Relative Level of Investment ® Perceived Risk	0.10	N.S.
Note: * Represents the difference in c^2 between models with moderator parameters constrained and freed.			

Table 5: Parameter Estimates Low vs. High Risk Propensity				
Parameter	**Low Group Estimate**	**Low Group t-value**	**High Group Estimate**	**High Group t-value**
Likelihood → Perceived Risk	0.39	2.71	0.00	0.00
Magnitude/Potential Loss → Perceived Risk	0.64	3.65	0.56	3.47
Magnitude/Relative Level of Investment → Perceived Risk	0.06	0.36	0.10	0.70

As explained in Schumacker and Lomax (1996), in SEM the ultimate goal is to identify the model that best fits the sample covariance matrix. When a model is tested and does not fit, it is deemed "misspecified", which may be due to omitting or including inaccurate variables or specifying relationships between variables that are incompatible. In such cases, the original model may be altered in a re-specification procedure in search of the best fitting model that yields statistically significant parameters, with theoretical support. It is understood that such models should be retested with different data drawn from a separate sample. In this study hypothesis 3, the relationship between magnitude/relative level of investment and perceived risk, was not supported. Magnitude/relative level of investment does not directly influence perceived risk. Further consideration of the relationship between the two magnitude variables in the model encourages re-specification. As noted by Forlani and Mullins (2000), greater investments increase the amount there is to lose on each venture. Thus, from a theoretical standpoint, magnitude/relative level of investment influences magnitude/potential loss. The initial model was re-specified to incorporate this change (see Figure 2), which places magnitude/potential loss as a mediator between magnitude/relative level of investment and perceived risk.

A strong fit is found for the alternative model with a $\chi^2_{(8)}=9.09$ (p=0.34), GFI=.99, AGFI=.97, and RMSEA=.021. The results of this analysis are displayed in Table 6.

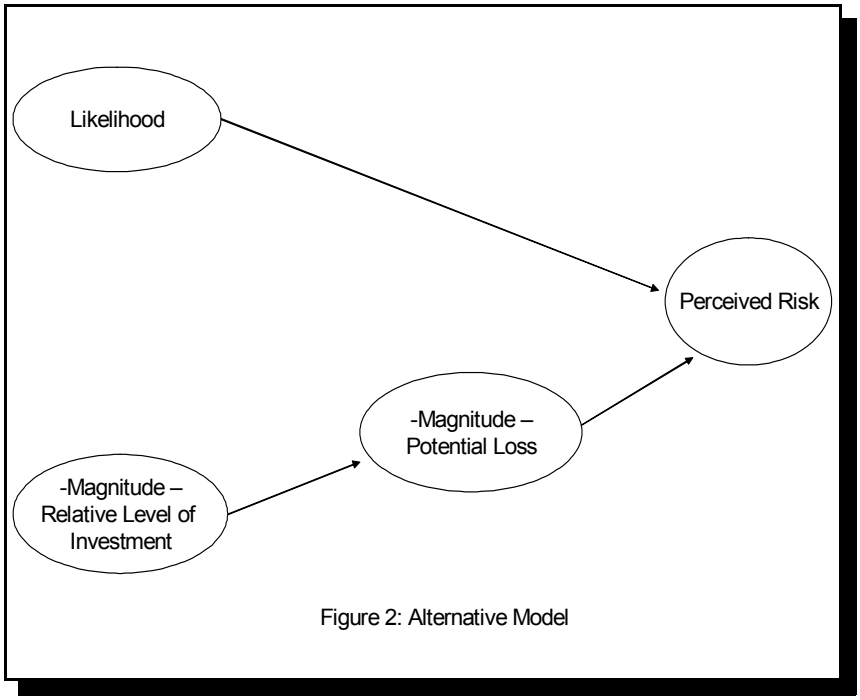

Figure 2: Alternative Model

Table 6: Analysis of Alternative Model

From	To	Standardized Estimate	t-value	Significance
Likelihood	Perceived Risk	.32	3.16	Significant
Magnitude/Relative Level of Investment	Magnitude/Potential Loss	.48	7.08	Significant
Magnitude/Potential Loss	Perceived Risk	.70	6.94	Significant

Note: * The t-value for a parameter is defined as the parameter estimate divided by its standard error. Parameters whose t-values are larger than two in magnitude are normally judged to be different from zero, i.e. significant.

DISCUSSION AND IMPLICATIONS

These results provide important insights for both entrepreneurs and future researchers in this field. We offer support for Forlani and Mullin's (2000) work by demonstrating the influence of likelihood and magnitude/potential loss on perceived risk in a sample of actual entrepreneurs answering questions about their own entrepreneurial pursuits. We also provide evidence that the

magnitude/relative level of investment construct does not directly influence perceived risk. Rather, as demonstrated in the alternative model, magnitude/potential loss acts as a mediator between the other two variables. Thus, magnitude/relative level of investment appears to have an indirect influence on perceived risk.

Our test of the moderating role of risk propensity extends Forlani, Mullins, and Walker's (2002) work. These authors tested hypotheses in a sample of product managers, while our study finds support for its moderating effect among entrepreneurs. Similar to their study, we also find the moderating effect to be limited to the likelihood – perceived risk relationship, with no effect on the magnitude – perceived risk relationships. One explanation for this may be the nature of likelihood versus magnitude. Likelihood is more of a subjective perceptual measure than magnitude, which is based on objective factual information. This difference is perhaps more pronounced in new venture decisions, where historical information does not exist and so the assessment of likelihood must be based on intangible factors. It is possible that subjective evaluations are more influenced by individual traits of the entrepreneur than evaluations of objective information.

The research findings suggest some direction for those who wish to engage in perceived risk reduction strategies among entrepreneurs. First, entrepreneurs' perception of the likelihood of losing money on a new venture significantly and directly influences their perception of the risk associated with it. Likelihood of potential loss represents the probability that the actual result of a new business venture will deviate from the outcome that the entrepreneur desires. Thus, while likelihood of potential loss influences perceived risk, it is an intangible and more perception-based assessment, rather than an objective estimate of the loss that they may incur. Perceived risk can be reduced if the likelihood of loss can be demonstrated to be low.

Second, the research demonstrates that one of the more objective venture-related magnitude variables – degree of potential loss – has a direct influence on the risk perceived by the entrepreneur. Not surprisingly, larger required investments result in higher perceived risk in the new venture. The findings also suggest, however, that a second measure of magnitude – as defined as the relative level of an entrepreneur's investment compared to his net worth – does not directly influence the risk he perceives. Rather, as demonstrated in an alternative model, the objective magnitude of an entrepreneur's potential loss acts as a mediator in the relationship. Thus, the impact of the relative level of an entrepreneur's investment on perceived risk is mediated by the objective size of the investment required in the venture. Larger investments mediate the impact of the relative investment on perceived risk in the new venture more than smaller ones. Reducing the size of the investment required, such as by breaking it up into staged capital commitments, should reduce perceived risk for entrepreneurs who face a high level of investment compared to their net worth.

Third, the research demonstrates that an entrepreneur's risk propensity, which refers to the inherent tendency of an entrepreneur to select more risky ventures, negatively influences the relationship between the entrepreneur's assessed likelihood of venture failure and the amount of risk an entrepreneur perceives in a business opportunity. Therefore, entrepreneurs with a higher

propensity for risk do not perceive the same level of risk associated with the likelihood of a potential loss from an entrepreneurial venture as compared to an individual with a lower level of risk propensity. Thus, an entrepreneur's predisposition toward personal risk propensity significantly influences how he or she perceives the extent to which venture related variables affect risk. Entrepreneurs who are aware of where they fall on the risk propensity scale can more aptly assess the true risk of a new venture when considering likelihood and magnitude factors. An understanding of all of the elements that influence an entrepreneur's perceived risk can lead to more effective communication of new venture proposals and more effective negotiation in the new venture process.

As in all empirical research there are limitations to this study that need to be understood before interpreting the results. First, single informants were used as the source of information. Although our interest is in the risk perception of the entrepreneur who made the decision to start the new venture, the entrepreneurial team has been recognized as an important component in the success of a young business (Timmons 1999). Thus, it is reasonable to assert that teams will also play a role in the new venture decision-making process. A multiple informant study would provide information in this regard. A second limitation is the use of a retrospective methodology, which threatens a study's internal validity due to hindsight bias and recall errors. It is important to note, however, that our research provides support for Forlani and Mullins' (2000) work, which is based on an experimental study. Thus, the two studies together provide a level of balanced research methodology. Third, and finally, our study is focused only on the effects of individual risk propensity and the venture-related magnitude and likelihood variables. Contextual factors such as competencies, previous experience and motivations of the entrepreneur were not considered.

This study lays the groundwork for additional research in several areas. One question arises from a limitation of this research where contextual factors such as previous experience and competencies were not considered. Research involving how individual traits, other than risk propensity, affect the influence of venture-related factors on risk perception is needed. For example, do previous experience and competency in new venture development act as direct influences on risk propensity, which then moderates the likelihood – risk perception relationship, as demonstrated in this study? Or, are previous experience and competency direct moderators in the likelihood-risk perception relationship? It is possible that experience and competency have more of a moderating effect than risk propensity. If so, what other individual traits exist which influence risk perception through a moderating role?

On a related note, a better understanding of individual differences in risk perception of entrepreneurs from different cultures and nations is needed. Future researchers could apply the model suggested in this paper for both developed and developing nations to test for differences and similarities in application. Extending the model to isolate the influence of the political and business environment on risk perception factors would provide assistance in understanding how entrepreneurial efforts can be improved in developing nations.

An investigation of the role an entrepreneurial team may play in the perception of risk and the new venture decision-making process is also an important area of study. Issues such as trust between team members and belief in one another's capabilities are likely to be influential. It is also likely that individual differences exist in key investors' natural dependencies upon others in evaluating the risk of a potential new venture. Confidence in their capabilities versus that of their team members may play a role in this characteristic.

Additionally, the magnitude construct can be further developed. Validation is needed regarding the indirect influence of magnitude-relative level of investment on perceived risk, with magnitude-potential loss as a mediator. Testing this relationship among a different sample of entrepreneurs and through the use of both a retrospective and experimental research methodology will enrich the knowledge base in this area. Other components of magnitude may also exist. Uncovering these factors and how they relate to one another will advance theory development.

Finally, research is needed into how the cognitive methods used by entrepreneurs differ from those of other managers in their overall risk perceptions of new business opportunities. The motivations and decision processes of entrepreneurs are critical to the continued growth of a capitalistic economy. Through better understanding of this process, new policies and legislation may be crafted that enhances the flow of capital toward the creation of new business entities, resulting in job creation and positive economic growth.

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