

**Self-Regulation and Heuristics in Entrepreneurial  
Opportunity Selection and Exploitation**

**PRESENTED AT THE 2006 ACADEMY OF MANAGEMENT MEETING**

**ATLANTA, USA, AUGUST 2006**

Peter Bryant  
Senior Lecturer  
Macquarie Institute for Innovation  
Building E4A, Macquarie University NSW 2109  
Australia  
Phone: 61-2-9850 4811 Fax: 61-2-9850 4802  
Email: [peter.bryant@mq.edu.au](mailto:peter.bryant@mq.edu.au)

## **SELF-REGULATION AND RISK TAKING IN ENTREPRENEURIAL OPPORTUNITY SELECTION AND EXPLOITATION**

### **ABSTRACT**

Recent research has investigated the role of entrepreneurial cognition in risk taking about opportunities. However these processes are not yet fully understood and significant gaps remain. This study explores one such gap, namely the role of self-regulation in entrepreneurial risk perception and risk propensity. The study employs mixed methods integrating quantitative and qualitative techniques. I use survey instruments to measure two existing self-regulatory constructs: regulatory pride and self-efficacy. The results suggest that entrepreneurs are heterogenous in terms of their self-regulatory characteristics. When analysed in combination with interview data, the results suggest that self-regulation is strongly related to risk propensity and risk perception about the selection and exploitation of opportunities.

### **Keywords**

Entrepreneurial cognition, Decision making, Opportunity evaluation

Entrepreneurs have been characterized as people who seek and accept opportunity risks more readily than other types of managers (Bhide, 2000; Stewart, Watson, Carland, & Carland, 1999). Scholars argue that having recognized a new opportunity, entrepreneurs perceive and accept the associated risks differentially, leading to active selection and exploitation of the opportunity (Forlani & Mullins, 2000; Palich & Bagby, 1995). Risk propensity and perception are therefore important topics in the study of entrepreneurship, and especially in relation to opportunity selection and exploitation (Baron, 2004; Busenitz et al., 2003; Forbes, 1999).

Earlier research into these aspects of entrepreneurial risk taking assumed they could be conceptualized as personality traits unencumbered by many mediating or moderating variables (Covin & Slevin, 1991; Shaver & Scott, 1991). McClelland (1961) suggested that risky decision making among entrepreneurs could be explained by high need for achievement. However, these arguments have not been supported by empirical studies. For example, Brockhaus (1980) found that entrepreneurs were not distinguished from employee managers in terms of risk propensity. The personality trait approach has thus proven inconclusive and has been largely abandoned by the majority of scholars (Busenitz et al., 2003).

Instead, recent research on entrepreneurial risk taking has focused on cognitive and environmental factors (Mitchell et al., 2004). Most notably, a number of scholars have explored the role of “entrepreneurial cognition,” which includes mental models, heuristics, intuitions and self-regulatory skills (Baron, 2004; Busenitz & Barney, 1997). For example, Busenitz (1999) has shown the important role of cognitive bias and heuristics as mediators of risk in entrepreneurial decision-making. De Carolis and Saporito (2006) argue for an expanded role for heuristic bias in risk taking, linking such cognitive attributes to entrepreneurs’ social capital. Also using a cognitive perspective, Palich and Bagby (1995) showed that entrepreneurs did not display higher

risk propensity compared to other managers, however they tended to categorize risky business scenarios more positively than non-entrepreneurs.

Other studies suggest a positive relation between entrepreneurial risk propensity and the social cognitive self-regulatory construct known as self-efficacy, which is the belief in one's own ability to be efficacious in specific task domains (Chen, Greene, & Crick, 1998; Shaver, Gartner, Crosby, Bakalarova, & Gatewood, 2001). In fact, self-regulation is central to the way in which people perceive risks associated with new tasks and challenges, their levels of confidence and motivational strength in the pursuit of risky endeavors, and their orientation or propensity towards positive and negative risks (Bandura & Locke, 2003; Higgins, 2000a). Not surprisingly, therefore, a number of scholars have called for further research into the self-regulatory aspects of entrepreneurial cognition and risk taking (Baron, 2004; Brockner, Higgins, & Low, 2004).

However, some studies into entrepreneurial cognition have also treated entrepreneurs as homogeneous and assumed that a common set of cognitive attributes could be identified among them (Forbes, 2005b; Korunka, Frank, Lueger, & Mugler, 2003). In opposition to this assumption, others argue that entrepreneurs should be regarded as heterogeneous, and especially with regard to their cognitive and behavioral characteristics (Sarasvathy, 2004). Indeed, the assumed homogeneity underpinning some earlier studies of entrepreneurial cognition in risk taking may be one reason why they have proven inconclusive and unreliable (Busenitz et al., 2003).

Another feature of some studies into entrepreneurial cognition and risk taking is their apparent neglect of complexity (McKelvey, 2004; Slevin & Covin, 1997). Often studies have focused on singular independent variables, and thereby failed to recognize the complexity and multi-dimensionality of entrepreneurship observed by others (Busenitz et al., 2003). For

example, some studies of self-efficacy treat entrepreneurs as a homogenous group and suggest that self-efficacy may fully explain entrepreneurial self-regulation (Chen et al., 1998; Scherer, Adams, Carley, & Wiebe, 1989). Not surprisingly, perhaps, many of the findings are inconclusive and hard to replicate. Indeed, in a more recent study of entrepreneurial self-efficacy, Forbes (2005b) found evidence of heterogeneity and complexity. Moreover, overly simplified treatments of these topics are not restricted to entrepreneurship. The practice is widespread in studies of social cognitive psychology, reflecting the tendency to seek parsimonious explanatory models that are amenable to concise empirical tests (Mischel & Shoda, 1995).

To date, however, there has been little research into other aspects of self-regulation as factors in entrepreneurial risk perception and risk propensity. I address that gap in this study, seeking to investigate whether or not entrepreneurs are heterogeneous and complex with respect to self-regulation and its role in risk taking. I ask the following questions: do entrepreneurs possess a distinctive pattern of self-regulation, and what is the role of self-regulation in entrepreneurial risk perception and risk propensity regarding opportunity selection and exploitation?

The study is exploratory and seeks to lay the groundwork for new theories about these phenomena. I adopted a mixed methods approach. I surveyed thirty entrepreneurs to measure two existing self-regulatory constructs: regulatory pride and entrepreneurial self-efficacy. The findings suggest that entrepreneurs are indeed distinct in terms of their self-regulatory characteristics. In addition, I interviewed the same thirty entrepreneurs about their decision-making and approach to opportunity risk. This having been done, the interview data was used to expand the analysis. I combined the survey and interview data during analysis to identify relationships between self-regulation, risk perception and risk propensity. The findings suggest

that entrepreneurs are distinct in terms of the role played by self-regulation in their approach to opportunity risk.

## **THEORETICAL BACKGROUND**

### **Central Concepts**

There are divergent definitions of “entrepreneur” (Shane, Locke, & Collins, 2003). One approach focuses on entrepreneurs as agents who open up new markets and drive innovation (e.g., Lumpkin & Dess, 1996). From that perspective, entrepreneurs are people who play a significant role in those processes, whether as founder managers or corporate employees. Another approach focuses on entrepreneurs as the founders of new ventures, and this approach typically excludes franchise owners and employees (e.g., Shaver & Scott, 1991). Because this study highlights the role of individual self-regulation and its role in risk taking, I also define entrepreneurs as founder managers. This definition has been used in other studies of entrepreneurial decision-making (e.g., Allinson, Chell, & Hayes, 2000; Brockhaus, 1980; Forbes, 2005a). However, I do not thereby assume that founder managers are a homogenous group in terms of self-regulation and other psycho-social characteristics.

Regarding self-regulation generally, it is an important topic in the study of social cognition, which is distinguished from non-social cognition by its focus on the interaction between social and cognitive variables (Higgins, 2000b). Social cognition is increasingly relevant for management studies as organizational boundaries and networks become more dynamic and societal (Brotherton, 1999). Within theories of social cognition, self-regulation is widely seen as a systematic process of human thought and behavior that involves setting personal goals and steering oneself toward the achievement of those goals (Vancouver & Day, 2005).

Regarding the definition of risk, Sitkin and Pablo (1992: 10) explain risk as “the extent to which there is uncertainty about whether potentially significant and/or disappointing outcomes of decisions will be realized.” This captures what they regard as the three major components of risk: outcome uncertainty, outcome expectations, and outcome potential. Risk is also distinguished from “Knightian” uncertainty, which refers to an inability to estimate probabilities owing to inadequate information (Knight, 1921; Sarasvathy, 2004). Furthermore, insofar as risk is a person’s conditional estimation of an outcome probability, then it can be regarded as a socially constructed concept, rather than an objective reality of the world (Slovic, 2000b). In this study, I define decision risk as the socially constructed estimation of the chance of some outcome being realized. Risk perception is defined as the assessment of the risk inherent in a situation, and risk propensity is defined as the willingness to take risks (Sitkin & Pablo, 1992).

### **Theories of Self-Regulation**

There are a number of theoretical frameworks employed in the study of self-regulation: goal-setting theory (Latham & Locke, 1991), control theory (Carver & Scheier, 1998), social cognitive theories (Bandura, 1997), and self-discrepancy theory (Higgins, 1998). Each has its strengths, but they are not always compatible (Zeidner, Boekaerts, & Pintrich, 2000). However, it is not the purpose of this study to adjudicate between them. Instead, the study focuses on two distinct constructs – regulatory pride (Higgins et al., 2001) and self-efficacy (Bandura, 1997) – that have already been studied in relation to decision-making. The rationale is to build on studies in other fields to bring greater theoretical coherence to entrepreneurship research. Notably, this is one of the first studies in any field to combine those two particular constructs. Together, they cover the key attributes of self-regulation: self-reference, motivation systems, goal frameworks, and related affective and cognitive attributes. The combination of related constructs in this way

has been called for by leading scholars in the field (Higgins, 2000b; Wood, 2005), and is recognised as an appropriate way of developing new theory in organizational studies (Whetten, 1989). The following sections discuss each construct.

***Regulatory Pride.*** Regulatory pride is defined as the chronic form of a person's regulatory focus (Higgins et al., 2001), and regulatory focus is defined as a person's orientation towards future goals and self-states. Regulatory focus comprises two types of regulatory orientation, promotion focus and prevention focus (Higgins, 1998). Promotion focus describes those circumstances where growth and advancement needs motivate people to try to bring themselves into alignment with their ideal selves, thereby heightening the importance of potential gains and the use of eagerness approach means. In contrast, prevention focus describes those circumstances where security and safety needs prompt people to seek alignment with their ought selves, thereby increasing the avoidance of potential losses and the use of vigilance means. Regulatory focus can be either situational or chronic, with its chronic form expressed as regulatory pride.

Regulatory pride is based upon a person's subjective history of success or failure in strategic goal achievement (Higgins et al., 2001). As the expression of chronic regulatory focus, regulatory pride occurs as either promotion pride or prevention pride. As Higgins (2001: 21) explains: "Promotion pride and prevention pride are conceptualized as orientations to new task goals that derive from a sense of history of past success in promotion and prevention goal attainment, respectively." People with stronger promotion pride are less likely to make errors of omission (failing to act), whereas people with stronger prevention pride are less likely to make an error of commission (making a mistake) (Higgins et al., 2001).

Higher promotion pride is also positively related to the number of means per goal. That is, if people act from promotion pride, the resulting eagerness orientation should incline them to use more goal means that could produce a hit. Whereas people who act from prevention pride possess a vigilance orientation that inclines them to use less unnecessary goal means that could produce a mistake. Success in promotion goal achievement is also associated with positive emotion, optimism, and high self-esteem (Grant & Higgins, 2003). In this study, I investigate regulatory pride because it captures a person's chronic regulatory focus and achievement history in relation to new decision tasks, and similar factors have already been associated with entrepreneurial cognition in decision-making (Greve & Salaff, 2003; Krueger Jr, Reilly, & Carsrud, 2000; Steier, Chrisman, & Chua, 2004; Stewart et al., 1999).

Various studies have shown the significance of regulatory pride for decision-making. Promotion pride is related to being eager, risky, and oriented toward the future presence of positive outcomes (toward accomplishments and advancements), whereas prevention pride is related to being careful, cautious, and oriented toward ensuring against negative outcomes (toward being responsible and faultless) (Grant & Higgins, 2003). That is, people acting from promotion pride have a dominant concern to attain gains and avoid non-gains, while people acting from prevention pride have a dominant concern to avoid losses and attain non-losses (Förster, Higgins, & Bianco, 2003).

Not surprisingly, some scholars have noted the relevance of regulatory focus, and especially promotion focus, for entrepreneurship, given that entrepreneurs often focus more on potential gains and approaching success, while focusing less on potential losses and avoiding failure (Brockner et al., 2004). Indeed, studies have shown that entrepreneurs are strongly

motivated to approach or attain positive task goals, which is an important feature of regulatory pride (Alvarez & Busenitz, 2001; Baron, 2004; Shane & Venkataraman, 2000).

*Self-Efficacy.* The second self-regulatory construct included in this study is self-efficacy, which refers to a person's belief in their ability to be efficacious in specific task domains. It is the central construct in Albert Bandura's (1997) Social Cognitive Theory which claims that human beings possess self-reflective and self-reactive capabilities that enable some control over their thoughts, feelings, motivation, and actions. Self-efficacy also relates to other aspects of self-regulation, such as self-confidence, task commitment, and motivational strength. It is especially important for advanced cognitive functioning, such as managing complexity, uncertainty and risk, where agents require greater confidence and commitment to perform more sophisticated cognitive tasks. For example, significant positive relationships have been shown between hospital top managers' risk propensity and self-efficacy (Tabak & Barr, 1999).

However, in contrast to regulatory pride, self-efficacy is not in itself about motivations or goal focus, nor is it about the specific skills one has, but rather it concerns judgments of what one can do with whatever skills one possesses to reach one's goals (Bandura, 1997). That is, while regulatory pride relates to the nature and strength of a person's strategic goals, self-efficacy relates to a person's level of confidence and commitment to pursue his or her goals. Yet some features of self-efficacy also correspond to aspects of promotion pride. In particular, strong promotion pride is associated with greater self-esteem and optimism (Grant & Higgins, 2003), both of which have been associated with self-efficacy (Bandura, 1997).

This study measures the construct known as entrepreneurial self-efficacy, that is, the belief in one's efficacy in performing entrepreneurial tasks. As noted earlier, this construct has already received attention in the literature, suggesting that entrepreneurial self-efficacy is an

important component of self-regulation among entrepreneurs and especially relevant for risk taking (Shaver et al., 2001; Vecchio, 2003). People with high perceived self-efficacy focus on the pursuit of opportunities and risk seeking (that is, more promotion oriented), whereas the less self-efficacious dwell on the avoidance of mistakes and risk avoidance (that is, more prevention oriented) (Bandura & Locke, 2003). In fact, some scholars regard self-efficacy and risk taking as so closely related that they include risk taking as a factor in the entrepreneurial self-efficacy construct (Chen et al., 1998).

### **Theories of Risk Taking**

In classical theories, risk taking was related to Bayesian ideals of probability and expected utility. In an ideal world, people would have sufficient information to arrive at objective measures of risk and then make rational decisions to maximize their utility (Kahneman & Tversky, 1979; Knight, 1921). However, in more recent times, concepts of limited information, bounded rationality and attention to psycho-social factors have redrawn the map of risk research (Schwartz, 2002). Scholars now incorporate the psychological and sociological factors relating to risk perception and risk propensity as socially constructed phenomena (Slovic, 2000a). In the same fashion, scholars in fields such as behavioral economics have explored the cognitive factors associated with heuristic bias in risky decision-making (Kahneman & Lovallo, 2000). Researchers have thus uncovered more of the internal complexities associated with risk. It is no longer seen as a single unitary process, where people make rational assessments of probabilities based on information. Rather, people possess general propensities to accept or avoid risks, they perceive and assess risks based on subjective criteria, and they make idiosyncratic trade-offs between risk and reward in their decision-making (Sitkin & Pablo, 1992).

The contemporary approach to risk perception and risk propensity as factors in risk taking is largely owing to work by Sitkin and his colleagues (Sitkin & Pablo, 1992; Sitkin & Weingart, 1995). They defined risk perception as the assessment of the risk inherent in a situation, and risk propensity as the willingness to take risks (Sitkin & Pablo, 1992: 12). They argued for a more complex model of risk, including risk perception and risk propensity as significant mediators of risk taking. They also identified other important factors including organizational context, problem situation and an individual's psychological and social characteristics. Their studies showed the distinct effects of problem framing and outcome history as key determinants of risk perception and risk propensity respectively. These factors had been overlooked and sometimes confounded in prior studies. In this study, I focus on the potential relationship between self-regulation and (a) problem framing as a key determinant of risk perception, and (b) outcome history as a key determinant of risk propensity.

***Risk Perception.*** Regarding the determinants of risk perception, Kahneman and Tversky (1979) played a key role in establishing the importance of problem framing in this process. In a series of seminal studies, they showed that how a risk is framed has a major impact on how a risk is perceived. However, if risk perceptions are not further examined, it is unclear how problem framing affects decision-making in actual contexts (Sitkin & Weingart, 1995). In particular, it is important whether a risk is framed as a positive risk (the chance of making a gain), or as a negative risk (the chance of making a loss). This implies that the way in which entrepreneurial risks are framed will have a significant impact on how those risks are perceived. Positive frames will tend to stimulate more favourable risk perceptions, while negative frames will tend to stimulate less favourable risk perceptions.

Importantly for this study, a number of recent studies suggest that self-regulatory factors are significant mediators in the framing of positive and negative risk (e.g., Kluger, Stephan, Ganzach, & Hershkovitz, 2004; Tabak & Barr, 1999; Zhou & Pham, 2004). In relation to regulatory pride, in particular, people who act from stronger promotion pride will be more likely to frame an opportunity in terms of potential gains and positive risk, while those with stronger prevention pride will be more likely to frame the same opportunity in terms of potential losses and negative risk.

***Risk Propensity.*** Regarding the determinants of risk propensity, most earlier studies focused on either individual risk orientation or assessments of risk, and largely ignored the role of a person's previous decisions and their outcome history (e.g., Kahneman & Tversky, 1979). Sitkin and Weingart (1995) challenged this a-historical approach, and confirmed that prior success in taking risks can increase the propensity to take future risks. They demonstrated that the more successful the outcomes of a decision maker's risk-related decisions have been, the higher his or her risk propensity. This finding contradicted the view that risk propensity is a stable cognitive or personality trait, and suggested that a person's willingness to take risks is significantly dependent on their prior experience of risk taking in particular task domains. Thus, the nature of an entrepreneur's prior experience in risk taking should have a significant impact on their willingness to take future risks, and thus on their entrepreneurial risk propensity.

It should be noted that regulatory pride captures much of the meaning of outcome history in relation to risk propensity. That is, regulatory pride (or chronic regulatory focus) is derived from a person's sense of outcome history regarding positive and negative task achievement, and that is very close to the concept of outcome history employed by Sitkin et al (1992; 1995) in relation to risk propensity. Notably, this observation linking regulatory pride and a person's risk

taking outcome history has not been made before. Furthermore, regulatory pride introduces a fundamental distinction between outcome history as either promotion pride or prevention pride. This suggests that the analysis of risk propensity should also distinguish between a person's outcome history relating to gains and non-gains (from a promotion orientation), and a person's outcome history relating to losses and non-losses (from a prevention orientation).

Assuming the validity of this distinction, a person with stronger promotion pride should be more willing to risk incurring a loss in order to pursue a gain; that is, seeking the positive risk of gains outweighs aversion to the negative risk of losses. Whereas a person with stronger prevention pride should be more willing to risk missing a gain in order to avoid a loss; that is, aversion to the negative risk of losses outweighs seeking the positive risk of gains. For the same reasons, those with stronger promotion pride should be less willing to risk an error of omission (failing to act), and more willing to risk an error of commission (making a mistake) (cf., Higgins et al., 2001). While those with stronger prevention pride should be less willing to risk an error of commission, and more willing to risk an error of omission. Previous studies of entrepreneurs have largely failed to make these distinctions, and instead conflated positive and negative risk perception and related risk propensities. That could help to explain why some previous studies have been inconclusive (cf., Petrakis, 2005).

### **Entrepreneurial Risk taking**

As noted earlier, both the personality trait and cognitive approaches have been used in studies of entrepreneurial risk taking. Some scholars continue to seek an explanation of entrepreneurial risk taking in terms of personality traits, and they acknowledge that such studies need to admit greater complexity and heterogeneity (Korunka et al., 2003; Miner & Raju, 2004). For example, Das and Teng (1997) argue for additional personality variables as factors in

distinguishing between short-term and long-term risks. However, despite these reputable studies, most attention has shifted to the cognitive aspects of entrepreneurial risk taking.

By adopting a cognitive perspective, researchers have uncovered important insights into entrepreneurial risk taking. For example, Palich and Bagby (1995) report that entrepreneurs may not possess higher risk propensity and lower risk perception, but rather they perceive stronger positive risks and potential opportunities within business scenarios. They did not find evidence that entrepreneurial “types” were more predisposed to take risks than non-entrepreneurs, but their findings did suggest that entrepreneurs categorize risky business scenarios more positively than non-entrepreneurs. This finding suggests that entrepreneurs tend to view some situations as more positive opportunities, while others perceive the same circumstances as more negative (Vecchio, 2003). This distinction supports the relationship between risk perception and regulatory pride described above, that is, promotion pride is associated with framing opportunity risks as more positive, while prevention pride is related to framing opportunity risks as more negative.

Others have investigated the role of heuristic bias in entrepreneurial cognition and risk taking. Forlani and Mullins (2000) show that entrepreneurs tend to avoid high levels of variability in the selection of new opportunities, yet at the same time, they appear willing to accept very risky opportunities, presumably in the pursuit of larger potential gains. This finding supports the contention that entrepreneurs distinguish between positive and negative risks in relation to their strategic goal orientation. In another study, Krueger and Dickson (1994) show that subjects who are primed to believe they are very competent at decision making (that is, highly self-efficacious) see more opportunities in a risky choice and take more risks. Whereas, those who are primed to believe they are not very competent (that is, not self-efficacious) see

more threats and take fewer risks. They also found that the perception of opportunities was not related to the perception of threats, and that the perceived likelihood of an event depends on whether the event is a loss or a gain.

These findings reinforce the proposed relationships between risk perception and risk propensity with both regulatory pride and self-efficacy. Firstly, a person with a sense of promotion pride and a history of success in positive risk taking will tend to frame future risks more positively. For such a person, new opportunities are typically viewed as positive risks to attain gains. Secondly, owing to a history of prior success in risk taking, such a person will tend to possess strong self-efficacy and thus feel more confident and committed to take similar risks in future. Altogether, therefore, prior research suggests that historical success or failure in entrepreneurial risk taking will significantly impact on opportunity risk perception and risk propensity regarding opportunity selection and exploitation. This study was designed to investigate those potential relationships.

## **METHODS**

### **Research Design**

Scholars have called for more varied methods to explore the situational complexities of entrepreneurship (Gartner & Birley, 2002). In response to that call, I employed a mixed methods approach including both qualitative and quantitative techniques. The study is philosophically pragmatic in that I assume reality consists of a number of fundamental categories and is therefore ontologically heterogeneous. Assuming that position, I content that reality can be explored and understood using pluralistic methods (Creswell, 2003). That is, there is no single category of reality, such as the quantifiable physical world, which demands a single investigative framework such as positivism. Human thought and behavior are more varied and complex.

Working from that philosophical perspective, the qualitative component of the study consisted of semi-structured interviews with thirty entrepreneurs regarding decision-making and especially risk taking. These interviews were intended to explore the details and complexities of risky decision-making about opportunity selection and exploitation. In addition, the same thirty entrepreneurs were surveyed to measure their regulatory pride and entrepreneurial self-efficacy. The qualitative and quantitative data were integrated during analysis for each individual entrepreneur, allowing the study to link the survey results regarding self-regulatory construct variables with the interview data about entrepreneurial risk perception and propensity. Mixed method studies of this kind have been recognized for some time (Yin, 1994). As in this study, they may explore relatively narrow research questions, and may include small samples that are purposively selected to explore embedded processes.

### **Sampling**

The thirty entrepreneurs were purposively selected to represent a range of industries and stages of company growth, but they were primarily drawn from high technology growth sectors. Some were long-term serial entrepreneurs, while others were novices. A few had failed and tried again. They had all been founder managers who retained a significant role in their venture. They possessed a range of ages, education levels, industry backgrounds, and seven were women. Some of their companies were start-ups less than three years old, while a few were late expansion stage over eight years old. All were based in one region of Australia. The entrepreneurs included in the study are summarized in Table 1.

-----  
Insert Table 1 about here  
-----

## **Measures and Data Collection**

The study employed pre-existing instruments to measure the two self-regulatory constructs that were discussed earlier, and pre-published factors were applied to the results. Promotion pride and prevention pride were measured using an instrument called the Regulatory Focus Questionnaire (Grant & Higgins, 2003; Higgins et al., 2001). This instrument has been shown to have strong construct validity and reliability in a number of studies. It consists of eleven self-report questions relating to both parental and non-parental content. Entrepreneurial self-efficacy was measured using an instrument based on an older survey called the Self-Efficacy Scale (Scherer et al., 1989). It has been shown to have construct validity across a range of cultures and geographies, and has multidimensionality in terms of psychometric properties and task domains. It consists of five self-report questions. However, some scholars argue that a few aspects of the entrepreneurship task domain were not captured in this instrument, and alternatives have since been developed (cf. Boyd & Vozikis, 1994; Chen et al., 1998). However, none have shown consistently stronger reliability and validity.

To avoid potential report bias, I told all subjects that the study was broadly about decision-making, and they were kept unaware that I was exploring self-regulation and risk taking. Firstly, I conducted semi-structured interviews with all thirty entrepreneurs lasting approximately one hour each. I adopted a non-participant observer role, and used the same interview guide throughout. It covered a range of decision-making tasks including opportunity selection and exploitation. At the end of each interview, I invited the interviewees to talk openly about related topics. I then explained the survey questionnaire. Each participating entrepreneur answered the survey that included the two survey instruments described earlier, plus questions

regarding their background, demographic profile, experience, current role, and the history of their involvement in the company.

## RESULTS

### Survey Results

Once collected, the survey data were first tested to determine their degree of normalcy. PP-plots showed normal distribution for all self-regulatory construct variables. There were three non-extreme outliers in the scores for entrepreneurial self-efficacy which were retained following the recommended approach for exploratory studies of social psychological phenomena (Davidsson, 2005; Mischel, Shoda, & Mendoza-Denton, 2002). I then tested the internal reliability of the construct variables of promotion pride, prevention pride and entrepreneurial self-efficacy. The results were borderline significant: promotion pride ( $\alpha = 0.63$ ), prevention pride ( $\alpha = 0.79$ ), entrepreneurial self-efficacy ( $\alpha = 0.68$ ). While Cronbach's alpha is not in itself sufficient to demonstrate internal consistency and construct validity (Davidsson, 2005), these results agree with those of other studies (cf. Higgins et al., 2001; Scherer et al., 1989). However, despite the apparent normalcy of the data, I decided to use nonparametric tests because the sample was relatively small and some outliers were retained (Kinnear & Gray, 2004). Table 2 shows the descriptive statistics and Spearman correlations for the sample of entrepreneurs.

-----  
Insert Table 2 about here  
-----

The mean values suggest that the entrepreneurs possess stronger promotion pride than prevention pride. This result offers some support for those who argue that entrepreneurs typically possess a stronger promotion orientation (Brockner et al., 2004). With regard to the significance of each self-regulatory construct as a component of self-regulation among entrepreneurs, the

correlations suggest that promotion pride is positively associated with entrepreneurial self-efficacy ( $r = 0.42$ ,  $p < .05$ ,  $r^2 = 0.18$ ). A scatter plot showed that this relationship was linear. The inter-correlation of promotion pride and entrepreneurial self-efficacy is also moderately significant ( $\alpha = 0.66$ ). Finally, as in other studies of regulatory pride, promotion pride is not significantly correlated with prevention pride (Grant & Higgins, 2003).

### **Entrepreneurial-Regulation Ranking**

In summary, there is evidence to suggest that promotion pride and entrepreneurial self-efficacy are associated among entrepreneurs. These results also agree with the theoretical arguments and empirical findings in the literature (e.g., Baron, 2004; Brockner & Higgins, 2001; Brockner et al., 2004; Forbes, 2005b). Based upon these results and supporting evidence from the literature, I derived a ranking of the entrepreneurs in terms of their relative scores for promotion pride and entrepreneurial self-efficacy. To derive this ranking, I re-calculated the scores for both construct variables, assuming the highest score for each was equal to 1.00. I then added the two scores together for each entrepreneur, thus deriving a score for “entrepreneurial-regulation.” Having done that, I then categorized the entrepreneurs into three groups of 10 members (that is, tertiles) having relatively strong, moderate or weak entrepreneurial-regulation.

It is important to note, however, that the term “entrepreneurial-regulation” is not intended to imply a new construct as such, but simply describes the combined scores for promotion pride and entrepreneurial self-efficacy. The derivation of such a ranking is an example of data transformation within a mixed methods strategy, where results from quantitative methods can be incorporated into the results derived from a study’s predominant qualitative methods (Creswell, 2003).

The central role played by promotion pride suggests that most of the entrepreneurs have a relatively strong sense of past success in positive task achievement, and are habitually orientated towards eager approach means for new task goals, rather than vigilant avoidance means. Importantly, promotion pride appears positively related to a sense of entrepreneurial self-efficacy. Among the entrepreneurs, therefore, a history of past success in positive goal attainment appears related to a sense of self-efficacy for entrepreneurial tasks. As a result, they could be expected to approach entrepreneurial tasks, such as opportunity selection and exploitation, with a strong sense of self-efficacy associated with eagerness to attain gains. They would also tend to display self-efficacy associated with using more decision means, accepting more risk, and seeking to avoid errors of omission or failing to act. However, based on these results, it is not clear the degree to which entrepreneurial-regulation is an antecedent or consequence of entrepreneurial risk taking behavior.

### **Interview Results**

After the interviews were fully transcribed, I entered approximately three hundred pages of transcript into an electronic database indexed by interviewee and question number. Next, I coded each interview for recurrent themes using the computer application called NVIVO. I then conducted iterative cross-case analysis by comparing codes and themes, including frequency, intersection and proximity analysis. After the initial coding analysis was completed, I then organized the interviews into high, medium and low entrepreneurial-regulation groups, using the results from the survey analysis discussed earlier. It is important to note that this step was only performed after the initial coding was complete, in order to avoid potential coding bias. This approach is typical of mixed method studies that integrate quantitative and qualitative results

during analysis, especially when the different methods used in the study focus on closely related phenomena (Creswell, 2003).

***Stronger Entrepreneurial-Regulation.*** Further cross-case analysis of the interviews showed that entrepreneurs in the high entrepreneurial-regulation group were more likely to associate risk with opportunity exploitation compared to opportunity selection. They were also more likely to associate risk with opportunity exploitation, compared to those in the medium and low entrepreneurial-regulation groups. In fact, those in the high group were consistently positive about opportunity selection and rarely spoke about negative risk in this context. As one member of this group said regarding opportunity selection, “*So not being afraid of failure is important in that way, and wanting to be successful is important.*” That is, those with high entrepreneurial-regulation tended to frame new opportunity selection as positive risk (that is, the chance to make a gain), rather than as negative risk (that is, the chance to make a loss). Some members of the high group were even willing to select an opportunity even if they perceived a significant chance of failure. As one of them explained, “*you’ve just got to fail fast, and sort of get it done and get on to the next thing.*” Another remarked, “*The driving instinct is bite off more than you can chew, and chew like crazy.*”

Members of the high entrepreneurial-regulation group also spoke more often about using gut and intuition in opportunity selection, rather than conducting analytical risk assessments. In fact, members of the high group were more concerned about exploitation risks once an opportunity had been selected. They also mentioned exploitation risks more often than those in the medium and low groups. As one member of the high group said, “*Most of the risk it’s about execution.*” Overall, those with high entrepreneurial-regulation appeared to focus more on the downside risks of executing in dynamic and unpredictable environments, knowing they had

chosen inherently risky opportunities to exploit. As a consequence, they appeared less willing to accept negative opportunity exploitation risks, while still pushing ahead with exploitation and avoiding errors of omission. As one member of the high group said about opportunity exploitation, *“if you do the job right it’s not a risk at all. So I think there’s a perception of risk, I don’t think anyone takes risks in business, they have a go and they could stuff up.”* In this way, he used both promotion and prevention orientations in the management of exploitation risk. He was very committed to avoiding losses, but at the same time he was confidently pursuing attainment goals. Notably, Brockner and Higgins (2004) predict that entrepreneurs are energized by an adaptive combination of promotion and prevention orientations.

Another finding of this study relates to temporal orientation in risk perception. Those with high entrepreneurial-regulation tended to see opportunities and their related risks as more distant and related to longer-term goals and tasks. They focused further into the future when discussing opportunity selection, often referring to a long term vision or set of goals. As one of them said, *“I have a vision that’s driving me, and I can’t sometimes explain that vision to someone. I know it’s out there, I can touch it, but I can’t explain that.”* In this way, those with stronger entrepreneurial-regulation tended to view opportunity selection as the first step in a long-term process.

***Weaker Entrepreneurial-Regulation.*** On the other hand, those in the medium and low entrepreneurial-regulation groups were almost twice as likely to associate risk with opportunity selection compared to opportunity exploitation, and twice as likely to associate risk with opportunity selection compared to those in the high group. For example, one member of the low entrepreneurial-regulation group said his company was *“very much negatively driven - can we make sure we can deliver what we said. What are the risks that would cause that to fail.”*

Another remarked that before selecting a new opportunity, “*we would need to be comfortable that the downside risk was fairly known and if the worst thing eventuated it wouldn’t have a disastrous effect on the company.*” In this way, those with weaker entrepreneurial-regulation tended to frame opportunity selection in more negative terms (the chance of losses) and they were more cautious and less willing to accept such risks.

Furthermore, and in contrast to the high group, they did not refer to gut and intuition in the context of opportunity selection. Instead, they sought to analyse opportunities in order to assess the risks of future losses. As one said in relation to selecting new opportunities, “*I will just go through the process of entirely rationally based risk analysis of making that decision. Where are the risks, what percentage, things you can identify.*” Almost twice as many in the lower entrepreneurial-regulation groups spoke in this fashion. They typically indicated they would only choose an opportunity if they felt they had identified the major negative risks and identified ways to mitigate them.

Regarding exploitation risks, members of the medium and low groups spoke less frequently about them, and when they did so, they tended to talk about potential disasters or worst-case scenarios. In that regard, they appeared less concerned about execution risks on a day-to-day basis. Many said they had put in place systems or processes to monitor and mitigate those risks, and they felt that their careful analysis of the initial opportunity selection risk had reduced their exposure to exploitation risk. Having selected less risky opportunities in the first instance, they appeared less concerned about exploitation risks.

Members of the lower groups also differed from those in the high group in relation to with temporal orientation. As noted earlier, entrepreneurs in the high group tended to see opportunities and their related risks as more distant and related to longer-term goals and tasks. In

contrast, those in the lower groups tended to perceive opportunity risks as more near term and proximate, and not in terms of visionary goals or aspirations.

*Summary.* The results suggest that entrepreneurs with stronger promotion pride and entrepreneurial self-efficacy (stronger entrepreneurial-regulation) tend to perceive new opportunity selection as positive risk and are more willing to accept such risks. At the same time, they tend to perceive more negative risks in relation to opportunity exploitation and tend to avoid those risks. This may be partly explained by the fact that those in the high group appeared to select opportunities that were more inherently risky in the first instance. Their risk perceptions and propensities also appeared related to their temporal orientations. Those in the high group tended towards more long-term goals and distant time horizons, and often spoke about new opportunities in terms of a “vision” for the future.

On the other hand, entrepreneurs with weaker promotion pride and entrepreneurial self-efficacy (weaker entrepreneurial-regulation) tend to perceive more negative risks in relation to opportunity selection and are less willing to accept those risks. Yet they appear to perceive fewer negative risks in relation to opportunity exploitation, and are more willing to accept those risks. This finding may be partly explained by the fact that those in the lower groups tended to choose less risky opportunities in the first instance. They also tended towards more near-terms goals and proximate time horizons. Furthermore, as noted above, almost none of them spoke in terms of “vision” when discussing opportunity selection, but rather focused on more tangible and operational business goals.

## **DISCUSSION**

The results suggest a distinctive pattern of self-regulation among entrepreneurs. The central role played by promotion pride in entrepreneurial-regulation suggests that most

entrepreneurs have a relatively strong sense of past success in positive goal attainment, and are habitually orientated towards eager approach means for new task goals, rather than vigilant avoidance means. They also perceive new opportunities in a more positive light as the chance to attain gains, rather than in a negative light as the chance to incur losses. However, a sense of promotion pride is not sufficient to explain these tendencies.

Importantly, the significant pattern of self-regulation among the entrepreneurs lies in the relationship between promotion pride and entrepreneurial self-efficacy, which are the two components of entrepreneurial-regulation. Among entrepreneurs, promotion pride appears positively related to a sense of entrepreneurial self-efficacy. That is, entrepreneurs' self-perceptions of past success in positive goal achievement appear to be positively related to their self-efficacy in the entrepreneurial task domain. Their sense of past achievement success appears integral to their confidence and commitment to pursue future entrepreneurial tasks.

Those with high entrepreneurial-regulation also appear to regard risk as an inherent and acceptable feature of the long-term tasks associated with selecting and exploiting challenging opportunities, rather than the immediate short-term task of opportunity selection itself. This suggests that a sense of past success in risk taking, related to strong self-efficacy for entrepreneurial tasks, encourages more long term ambitious risk taking. This finding is supported by a number of recent studies of regulatory orientation. For example, Forster and Higgins (2005), showed that people in a promotion orientation think in more global and distant terms, whereas those in a prevention orientation think in more local and proximate terms. Another recent study demonstrated that a strong promotion orientation is associated with more risk taking consumer behavior (Hamilton & Biehal, 2005). While another showed that people with a dominant promotion orientation focus on more temporally distant goals (Pennington & Roese, 2003).

These findings also appear to reinforce the argument put forward by Das and Teng (1997), that entrepreneurs distinguish between short and long-term risks because of different habitual perceptions of time horizons. They argued that those who focus on short term risks tend to be more aware of potential losses or negative risks, while those who focus more on long term risks tend to be more concerned with potential gains and positive risks. This distinction is similar to that between distant-proximate orientation discussed by Forster and Higgins (Förster & Higgins, 2005), and suggests that regulatory pride may be positively related to time horizons as factors in risk perception as well.

Thus, the results suggest that a sense of past success in positive risk taking supports the framing of new opportunity selection as positive risk (chance of gain), rather than as negative risk (chance of loss). At the same time, a positive outcome history increases the propensity to take such risks in future. Similarly, past success of that kind fosters stronger task self-efficacy, or greater confidence and commitment to take opportunity selection risks in future. In summary, the stronger the entrepreneurial-regulation, the more likely it is that an entrepreneur will have a positive risk perception of new opportunity selection, and greater propensity and confidence to seek such risks. At the same time, they will perceive and seek to avoid the negative exploitation risks associated with inherently more risky opportunities.

Alternatively, those with weaker entrepreneurial-regulation will perceive more of the negative downside risks associated with new opportunity selection. They will be more conscious of the chance of incurring losses when selecting opportunities, as opposed to the positive risks of attaining gains. As a result, they will tend to show less propensity and confidence to seek such risks. At the same time, they will tend to perceive fewer negative risks in relation to opportunity

exploitation, having chosen less inherently risky opportunities. Therefore, they will tend to have a stronger propensity to accept exploitation risks.

Put another way, in relation to opportunity selection, the stronger the entrepreneurial-regulation, the more likely it is that an entrepreneur will perceive acts of omission as a negative risks, and acts of commission as positive risks. In addition, they will seek risks of commission (the risk of making a mistake), and avoid risks of omission (the risk of failing to act), (cf., Higgins et al., 2001). The opposite tendencies will be evidenced by those with weaker entrepreneurial-regulation.

On the other hand, in relation to opportunity exploitation, the stronger the entrepreneurial-regulation, the more likely it is that an entrepreneur will perceive acts of omission as a positive risks, and acts of commission as negative risks. At the same time, they will seek to avoid risks of commission, and seek risks of omission. Thus entrepreneurial-regulation appears to mediate outcome history as a determinant of risk propensity, and risk framing as a determinant of risk perception. Figure 1 summarizes these major findings about opportunity risk perception and propensity in relation to entrepreneurial-regulation.

-----  
Insert Figure 1 about here  
-----

However, it must be stressed that these tendencies did not appear to be strictly exclusive. All groups thought that opportunity selection and exploitation involved both positive and negative risks. Rather, they differed in the relative intensity of their perceptions of those different types of risk, and their relative willingness to take them.

Consequently, this study suggests that entrepreneurs are heterogeneous with respect to their self-regulatory characteristics, and also with respect to the complex role played by self-

regulation in risk perception and risk propensity. Any attempt to explain entrepreneurial risk taking should therefore accept a high degree of variance and complexity. In particular, future studies should distinguish between the positive and negative risks associated with opportunity selection and exploitation when seeking to understand entrepreneurial risk taking. Those distinctions have rarely been drawn in the past.

These findings are particularly noteworthy because this is one of the first studies in any field to investigate the relationship between regulatory pride and self-efficacy together with risk propensity and risk perception. For that reason, the results may also suggest new avenues of research into self-regulation and risk taking more generally. Indeed, a number of leading social psychologists have already called for studies that integrate separate self-regulatory constructs such as those used in this study (Higgins, 2000b; Wood, 2005). Furthermore, given that self-regulation is a fundamental feature of human functioning and self-directed goal pursuit, then entrepreneurial-regulation may also be a significant factor in other aspects of entrepreneurial cognition and behavior. Exploring those propositions will require more empirical studies, including a broader range of methodological approaches (Gartner & Birley, 2002).

Further research is also required to determine the degree to which entrepreneurial-regulation is an antecedent or consequence of entrepreneurial experience. It is possible that at least some portion of the relationship between promotion pride and entrepreneurial self-efficacy develops as entrepreneurs gain experience in the task domain. Answering this question will require empirical research of a longitudinal nature using larger samples. Such research could have practical outcomes as well. As this study has demonstrated, it is possible to measure self-regulatory characteristics. In addition, it is already known that self-efficacy (Bandura, 1997) regulatory pride can be primed situationally (Higgins et al., 2001). These techniques could be

used to enhance the self-regulatory skills of entrepreneurs and thus improve their approach to risk taking in relation to new opportunity selection and exploitation.

### **LIMITATIONS AND CONCLUSION**

Given the non-random, relatively small samples used in this exploratory study, the results cannot be used to make any strong claims about the general population of entrepreneurs. In addition, because the data were gathered from entrepreneurs and companies based in one geographic region, the results are somewhat limited in applicability to different markets and cultures. Nonetheless, the study's findings suggest that self-regulation plays a complex and important mediating role in both risk perception and risk propensity among entrepreneurs.

In conclusion, the study of entrepreneurship still awaits theories that consolidate its identity as a coherent field of enquiry. Recent attempts to develop such theories have focussed on the cognitive attributes of entrepreneurs, including the role of entrepreneurial cognition in risk perception and risk propensity about opportunities. However, studies on these topics have sometimes assumed that entrepreneurs are a homogenous group and focussed on isolated cognitive factors. On the contrary, this study suggests that entrepreneurs are more heterogenous and complex. They appear to differ from each other in terms of self-regulatory characteristics.

While further research is required to confirm these findings, the generality of entrepreneurial-regulation suggests it may be a significant factor in other aspects of entrepreneurial cognition and behavior. Finally, as organizations become more dynamic and adaptive, self-regulation has become a topic of increasing interest to scholars of organizational behavior and management cognition. In that regard, the results of this study imply that alternative combinations of regulatory pride and self-efficacy may warrant investigation in other fields of study and for different task domains.

## REFERENCES

- Allinson, C. W., Chell, E., & Hayes, J. 2000. Intuition and entrepreneurial behaviour. *European Journal of Work & Organizational Psychology*, 9(1): 31-43.
- Alvarez, S. A. & Busenitz, L. W. 2001. The entrepreneurship of resource-based theory. *Journal of Management*, 27(6): 755-776.
- Bandura, A. 1997. *Self-efficacy: The exercise of control*. New York: W.H. Freeman and Company.
- Bandura, A. & Locke, E. A. 2003. Negative self-efficacy and goal effects revisited. *Journal of Applied Psychology*, 88(1): 87-99.
- Baron, R. A. 2004. The cognitive perspective: A valuable tool for answering entrepreneurship's basic "why" questions. *Journal of Business Venturing*, 19(2): 221-239.
- Bhide, A. V. 2000. *The origin and evolution of new businesses*. Oxford: Oxford University Press.
- Boyd, N. G. & Vozikis, G. S. 1994. The influence of self-efficacy on the development of entrepreneurial intentions and actions. *Entrepreneurship Theory and Practice*, 18(4): 63-77.
- Brockhaus, R. H., Sr. 1980. Risk taking propensity of entrepreneurs. *Academy of Management Journal*, 23(3): 509-520.
- Brockner, J. & Higgins, E. T. 2001. Regulatory focus theory: Implications for the study of emotions at work. *Organizational Behavior and Human Decision Processes*, 86(1): 35-66.
- Brockner, J., Higgins, E. T., & Low, M. B. 2004. Regulatory focus theory and the entrepreneurial process. *Journal of Business Venturing*, 19(2): 203-220.
- Brotherton, C. 1999. *Social psychology and management*. Buckingham: Open University Press.
- Busenitz, L. W. 1999. Entrepreneurial risk and strategic decision making: It's a matter of perspective. *Journal of Applied Behavioural Science*, 35(3): 325-340.
- Busenitz, L. W. & Barney, J. B. 1997. Differences between entrepreneurs and managers in large organizations: Biases and heuristics in strategic decision-making. *Journal of Business Venturing*, 12(1): 9-30.
- Busenitz, L. W., West, I., G. Page, Shepherd, D., Nelson, T., Chandler, G. N., & Zacharakis, A. 2003. Entrepreneurship research in emergence: Past trends and future directions. *Journal of Management*, 29(3): 285-308.
- Carver, C. S. & Scheier, M. F. 1998. *On the self-regulation of behavior*. Cambridge: Cambridge University Press.
- Chen, C. C., Greene, P. G., & Crick, A. 1998. Does entrepreneurial self-efficacy distinguish entrepreneurs from managers? *Journal of Business Venturing*, 13(4): 295-316.

- Covin, J. G. & Slevin, D. P. 1991. A conceptual model of entrepreneurship as firm behavior. *Entrepreneurship Theory and Practice*, 16(1): 7-25.
- Creswell, J. W. 2003. *Research design: Qualitative, quantitative, and mixed methods approaches* (2nd ed.). Thousand Oaks: Sage Publications.
- Das, T. K. & Teng, B.-S. 1997. Time and entrepreneurial risk behavior. *Entrepreneurship Theory and Practice*, 22(2): 69-88.
- Davidsson, P. 2005. *Researching entrepreneurship*. New York: Pringer.
- De Carolis, D. M. & Saporito, P. 2006. Social capital, cognition, and entrepreneurial opportunities: A theoretical framework. *Entrepreneurship Theory and Practice*, 30(1): 41-56.
- Forbes, D. P. 1999. Cognitive approaches to new venture creation. *International Journal of Management Reviews*, 1(4): 415-439.
- Forbes, D. P. 2005a. Are some entrepreneurs more overconfident than others? *Journal of Business Venturing*, 20(3): 623-640.
- Forbes, D. P. 2005b. The effects of strategic decision making on entrepreneurial self-efficacy. *Entrepreneurship Theory and Practice*, 29(5): 599-626.
- Forlani, D. & Mullins, J. W. 2000. Perceived risks and choices in entrepreneurs' new venture decisions. *Journal of Business Venturing*, 15(4): 305-322.
- Förster, J. & Higgins, E. T. 2005. How global versus local perception fits regulatory focus. *Psychological Science*, 16(8): 631-636.
- Förster, J., Higgins, E. T., & Bianco, A. T. 2003. Speed/accuracy decisions in task performance: Built-in trade-off or separate strategic concerns? *Organizational Behavior & Human Decision Processes*, 90(1): 148-164.
- Gartner, W. B. & Birley, S. 2002. Introduction to the special issue on qualitative methods in entrepreneurship research. *Journal of Business Venturing*, 17(5): 387-395.
- Grant, H. & Higgins, E. T. 2003. Optimism, promotion pride, and prevention pride as predictors of quality of life. *Personality & Social Psychology Bulletin*, 29(12): 1521-1532.
- Greve, A. & Salaff, J. W. 2003. Social networks and entrepreneurship. *Entrepreneurship Theory and Practice*, 28(1): 1-22.
- Hamilton, R. W. & Biehal, G. J. 2005. Achieving your goals or protecting their future? The effects of self-view on goals and choices. *Journal of Consumer Research*, 32(2): 277-283.
- Higgins, E. T. 1998. Promotion and prevention: Regulatory focus as a motivational principle. *Advances in Experimental Social Psychology*, 30: 1-46.
- Higgins, E. T. 2000a. Making a good decision: Value from fit. *American Psychologist*, 55(11): 1217-1230.
- Higgins, E. T. 2000b. Social cognition: Learning about what matters in the social world. *European Journal of Social Psychology*, 30: 3-39.

- Higgins, E. T., Friedman, R. S., Harlow, R. E., Idson, L. C., Ayduk, O. N., & Taylor, A. 2001. Achievement orientations from subjective histories of success: Promotion pride versus prevention pride. *European Journal of Social Psychology*, 31(1): 3-23.
- Kahneman, D. & Tversky, A. 1979. Prospect theory: An analysis of decision under risk. *Econometrica*, 47(2): 263.
- Kahneman, D. & Lovallo, D. 2000. Timid choices and bold forecasts: A cognitive perspective on risk taking. In D. Kahneman & A. Tversky (Eds.), *Choices, values, and frames*. Cambridge: Cambridge University Press.
- Kinnear, P. R. & Gray, C. D. 2004. *Spss 12 made simple*. Hove and New York: Psychology Press.
- Kluger, A. N., Stephan, E., Ganzach, Y., & HersHKovitz, M. 2004. The effect of regulatory focus on the shape of probability-weighting function: Evidence from a cross-modality matching method. *Organizational Behavior and Human Decision Processes*, 95(1): 20-39.
- Knight, F. H. 1921. *Risk, uncertainty and profit*. Boston and New York: Houghton Mifflin Company.
- Korunka, C., Frank, H., Lueger, M., & Mugler, J. 2003. The entrepreneurial personality in the context of resources, environment, and the startup process — a configurational approach. *Entrepreneurship Theory and Practice*, 28(1): 23-42.
- Krueger Jr, N. F. & Dickson, P. R. 1994. How believing in ourselves increases risk taking: Perceived self-efficacy and opportunity recognition. *Decision Sciences*, 25(3): 385-400.
- Krueger Jr, N. F., Reilly, M. D., & Carsrud, A. L. 2000. Competing models of entrepreneurial intentions. *Journal of Business Venturing*, 15(5-6): 411-432.
- Latham, G. P. & Locke, E. A. 1991. Self-regulation through goal setting. *Organizational Behavior & Human Decision Processes*, 50(2): 212-247.
- Lumpkin, G. T. & Dess, G. G. 1996. Clarifying the entrepreneurial orientation construct and linking it to performance. *Academy of Management Review*, 21(1): 135-172.
- McClelland, D. C. 1961. *The achieving society*. Princeton, New Jersey: D. Van Nostrand Company.
- McKelvey, B. 2004. Toward a complexity science of entrepreneurship. *Journal of Business Venturing*, 19: 313-341.
- Miner, J. B. & Raju, N. S. 2004. Risk propensity differences between managers and entrepreneurs and between low- and high-growth entrepreneurs: A reply in a more conservative vein. *Journal of Applied Psychology*, 89(1): 3-13.
- Mischel, W. & Shoda, Y. 1995. A cognitive-affective system theory of personality: Reconceptualizing situations, dispositions, dynamics, and invariance in personality structure. *Psychological Review*, 102(2): 246-268.
- Mischel, W., Shoda, Y., & Mendoza-Denton, R. 2002. Situation-behavior profiles as a locus of consistency in personality. *Current Directions in Psychological Science*, 11(2): 50-53.

- Mitchell, R. K., Busenitz, L., Lant, T., McDougall, P. P., Morse, E. A., & Smith, J. B. 2004. The distinctive and inclusive domain of entrepreneurial cognition research. *Entrepreneurship Theory and Practice*, 28(6): 505-518.
- Palich, L. E. & Bagby, R. D. 1995. Using cognitive theory to explain entrepreneurial risk-taking: Challenging conventional wisdom. *Journal of Business Venturing*, 10(6): 425-438.
- Pennington, G. L. & Roese, N. J. 2003. Regulatory focus and temporal distance. *Journal of Experimental Social Psychology*, 39(6): 563-576.
- Petrakis, P. E. 2005. Risk perception, risk propensity and entrepreneurial behaviour: The greek case. *Journal of American Academy of Business, Cambridge*, 7(1): 233-242.
- Sarasvathy, S. D. 2004. Making it happen: Beyond theories of the firm to theories of firm design. *Entrepreneurship Theory and Practice*, 28(6): 519-531.
- Scherer, R. F., Adams, J. S., Carley, S. S., & Wiebe, F. A. 1989. Role model performance effects on development of entrepreneurial career preference. *Entrepreneurship Theory and Practice*, 13(3): 53-71.
- Schwartz, H. 2002. Herbert simon and behavioral economics. *Journal of Socio-Economics*, 31: 181-189.
- Shane, S. & Venkataraman, S. 2000. The promise of entrepreneurship as a field of research. *Academy of Management Journal*, 25: 217-226.
- Shane, S., Locke, E. A., & Collins, C. J. 2003. Entrepreneurial motivation. *Human Resource Management Review*, 13(2): 257-279.
- Shaver, K. G. & Scott, L. R. 1991. Person, process, choice: The psychology of new venture creation. *Entrepreneurship Theory and Practice*, 16(2): 23-45.
- Shaver, K. G., Gartner, W. B., Crosby, E., Bakalarova, K., & Gatewood, E. J. 2001. Attributions about entrepreneurship: A framework and process for analyzing reasons for starting a business, *Entrepreneurship Theory and Practice*, Vol. 26: 5-32: Blackwell Publishing Limited.
- Sitkin, S. B. & Pablo, A. L. 1992. Reconceptualizing the determinants of risk behavior. *Academy of Management Review*, 17(1): 9-38.
- Sitkin, S. B. & Weingart, L. R. 1995. Determinants of risky decision-making behavior: A test of the mediating role of risk perceptions and propensity. *Academy of Management Journal*, 38(6): 1573-1592.
- Slevin, D. P. & Covin, J. G. 1997. Time, growth, complexity, and transitions: Entrepreneurial challenges for the future. *Entrepreneurship Theory and Practice*, 22(2): 53-68.
- Slovic, P. 2000a. Introduction and overview. In P. Slovic (Ed.), *The perception of risk*. London and Sterling, VA: Earthscan.
- Slovic, P. 2000b. Trust, emotion, sex, politics and science: Surveying the risk-assessment battlefield. In P. Slovic (Ed.), *The perception of risk*. London and Sterling VA: Earthscan.

- Steier, L. P., Chrisman, J. J., & Chua, J. H. 2004. Entrepreneurial management and governance in family firms: An introduction. *Entrepreneurship Theory and Practice*, 28(4): 295-303.
- Stewart, W. H. J., Watson, W. E., Carland, J. C., & Carland, J. W. 1999. A proclivity for entrepreneurship: A comparison of entrepreneurs, small business owners, and corporate managers. *Journal of Business Venturing*, 14(2): 189-214.
- Tabak, F. & Barr, S. H. 1999. Propensity to adopt technological innovations: The impact of personal characteristics and organizational context. *Journal of Engineering and Technology Management*, 16(3,4): 247-270.
- Vancouver, J. B. & Day, D. V. 2005. Industrial and organisation research on self-regulation: From constructs to applications. *Applied Psychology*, 54(2): 155-185.
- Vecchio, R. P. 2003. Entrepreneurship and leadership: Common trends and common threads. *Human Resource Management Review*, 13(2): 303-327.
- Whetten, D. A. 1989. What constitutes a theoretical contribution? *Academy of Management Review*, 14(4): 490-495.
- Wood, R. 2005. New frontiers for self-regulation research in io psychology. *Applied Psychology*, 54(2): 192-198.
- Yin, R. K. 1994. *Case study research design and methods* (2nd ed.). Thousand Oaks: Sage Publications.
- Zeidner, M., Boekaerts, M., & Pintrich, P. R. 2000. Self-regulation: Directions and challenges for future research. In M. Boekaerts & P. R. Pintrich & M. Zeidner (Eds.), *Handbook of self-regulation*: 750-768. San Diego: Academic Press.
- Zhou, R. & Pham, M. T. 2004. Promotion and prevention across mental accounts: When financial products dictate consumers' investment goals. *Journal of Consumer Research*, 31(1): 125-135.

**Table 1**  
**Summary of Entrepreneur Cases**

Company Age Years	Industry Sector	Gender	Role Tenure Years	Highest Education	Personal Age Years
(0-5) 43%	Biotech 37%	Female 23%	(< 1) 17%	Certificate 3%	(20-29) 3%
(6-10) 37%	ICT 46%	Male 77%	(1-2) 17%	1st degree 27%	(30-39) 27%
(11-15) 10%	Services 7%		(3-5) 43%	2nd degree 57%	(40-49) 40%
(16-20) 7%	Retail 10%		(6-9) 13%	Other 13%	(50-59) 27%
(21+) 3%			(10+) 10%		(60+) 3%

N= 30

**Table 2****Means, Standard Deviations and Correlations for Entrepreneurs**

<b>Variable</b>	<b>M</b>	<b>S.D.</b>	<b>1</b>	<b>2</b>
1. Promotion Pride	2.29	0.31		
2. Prevention Pride	2.05	0.54	-0.14	
3. Entrepreneurial Self-efficacy	3.84	0.65	0.42*	0.10

$N = 30$ ; \* $p < 0.05$ ; All effects are two-tailed tests  
Correlations are Spearman correlations

**Figure 1****Entrepreneurial-Regulation and Opportunity Risk**

		Entrepreneurial-Regulation	
		Lower	Higher
Opportunity Selection Risk		More negative perception Greater propensity to avoid	More positive perception Greater propensity to seek
Opportunity Exploitation Risk		More positive perception Greater propensity to seek	More negative perception Greater propensity to avoid