

**THE ROLE OF SELF-REGULATION IN DECISION  
MAKING BY ENTREPRENEURS**

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## **CERTIFICATION OF ORIGINAL AUTHORSHIP**

This thesis is submitted in fulfillment of the requirements of the degree of PhD, in the Graduate School of Management, Macquarie University. This represents the original work and contribution of the author, except as acknowledged by general and specific references. I hereby certify that this has not been submitted for a stronger degree to any other university or institution.

A handwritten signature in black ink, appearing to read 'P. Bryant', is written on a light blue grid background.

Signed by Peter Thomas Bryant on 17 July 2006

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## **ABSTRACT**

This thesis explores the role of self-regulation in decision making by entrepreneurs. It builds on prior research which has focused on the cognitive aspects of key decisions made by entrepreneurs. Among these key decisions are career choice, opportunity evaluation and opportunity exploitation. One area of this ongoing research program is the exploration of social cognition and self-regulatory factors in decision making. However, this area of research is still in its infancy, significant gaps remain and there are no coherent theories about such phenomena in the field of entrepreneurship. The purpose of this thesis is to contribute to theory development on these topics.

The thesis pursues these goals as an exploratory mixed methods multiple case study, investigating the relationship between self-regulation and decision making conceived as embedded processes of individual entrepreneurs as decision makers. The thesis is mixed methods because it combines both quantitative and qualitative techniques. I survey and interview 30 founder entrepreneurs and survey a control group of 30 employee managers. I use results derived from the survey data to compare entrepreneurs and managers in terms of their relative self-regulatory characteristics, and I then rank the entrepreneurs in those terms. Those results are combined with data gathered through interviews with the 30 entrepreneurs. The findings suggest significant relationships between self-regulation and the following important areas of decision making by entrepreneurs: decision styles, career choice, opportunity risk, the use of heuristics, the management of heuristic bias, decision speed and the role of values and ethics in decision making. Overall, the thesis contributes to the literatures on entrepreneurship, self-regulation and decision making.

## TABLE OF CONTENTS

<b>CERTIFICATION OF ORIGINAL AUTHORSHIP .....</b>	<b>I</b>
<b>ACKNOWLEDGMENTS .....</b>	<b>II</b>
<b>ABSTRACT .....</b>	<b>III</b>
<b>TABLE OF CONTENTS .....</b>	<b>IV</b>
<b>LIST OF TABLES.....</b>	<b>VII</b>
<b>LIST OF FIGURES.....</b>	<b>VIII</b>
<b>CHAPTER 1: INTRODUCTION .....</b>	<b>1</b>
BACKGROUND TO THE RESEARCH .....	1
RESEARCH QUESTIONS.....	6
RATIONALE FOR THE RESEARCH .....	14
METHODOLOGY .....	17
OUTLINE OF THE THESIS .....	21
DELIMITATIONS OF SCOPE AND KEY ASSUMPTIONS.....	23
CONCLUSION .....	25
<b>CHAPTER 2: LITERATURE ON ENTREPRENEURSHIP, SELF- REGULATION AND DECISION MAKING .....</b>	<b>27</b>
INTRODUCTION .....	27
MAJOR THEMES.....	28
ENTREPRENEURSHIP .....	32
SELF-REGULATION .....	44
DECISION MAKING .....	60
SELF-REGULATION AND DECISION MAKING .....	74
CONCLUSION .....	78
<b>CHAPTER 3: LITERATURE ON DECISION MAKING BY ENTREPRENEURS .....</b>	<b>79</b>
INTRODUCTION .....	79
DECISION STYLES .....	84
ENTREPRENEURIAL CAREER CHOICE .....	86
OPPORTUNITY RISK.....	88
HEURISTICS AND DECISION MAKING .....	95
STRESSORS AND HEURISTIC BIAS .....	97

DECISION SPEED.....	105
VALUES AND ETHICS IN DECISION MAKING.....	106
CONCLUSION .....	111
<b>CHAPTER 4: METHODOLOGY .....</b>	<b>114</b>
INTRODUCTION .....	114
METHODOLOGY AND ENTREPRENEURSHIP RESEARCH.....	115
PHILOSOPHICAL FOUNDATIONS.....	118
RESEARCH DESIGN .....	122
SELECTION OF CASES .....	127
DATA COLLECTION METHODS.....	131
DATA ANALYSIS.....	134
ROBUSTNESS OF METHODOLOGY .....	138
LIMITATIONS OF THE THESIS .....	140
ROLE OF THE RESEARCHER.....	142
CONCLUSION .....	144
<b>CHAPTER 5: RESULTS .....</b>	<b>145</b>
INTRODUCTION .....	145
SURVEY RESULTS .....	146
INTERVIEW RESULTS .....	152
DECISION STYLES .....	154
CAREER CHOICE.....	156
OPPORTUNITY RISK.....	162
DECISION HEURISTICS .....	168
MANAGING HEURISTIC BIAS .....	177
DECISION SPEED.....	179
VALUES AND ETHICS .....	184
CONCLUSION .....	190
<b>CHAPTER 6: DISCUSSION OF EMPIRICAL FINDINGS.....</b>	<b>192</b>
INTRODUCTION .....	192
SURVEY FINDINGS.....	195
DECISION STYLES .....	197
CAREER CHOICE.....	199
OPPORTUNITY RISK.....	202

HEURISTICS .....	206
DECISION SPEED.....	208
VALUES AND ETHICS .....	210
SUMMARY OF FINDINGS.....	217
IMPLICATIONS FOR FUTURE RESEARCH.....	219
IMPLICATIONS FOR PRACTICE.....	223
LIMITATIONS .....	225
CONCLUSION TO THE THESIS.....	226
<b>APPENDICES .....</b>	<b>229</b>
APPENDIX A: PARTICIPANT CONSENT LETTER .....	229
APPENDIX B: SEMI-STRUCTURED INTERVIEW GUIDE.....	231
APPENDIX C: REGULATORY FOCUS QUESTIONNAIRE .....	234
APPENDIX D: ENTREPRENEURIAL SELF-EFFICACY SCALE .....	236
APPENDIX E: NORMALCY OF ENTREPRENEUR DATA .....	238
APPENDIX F: NORMALCY OF MANAGER DATA .....	240
APPENDIX G: ENTREPRENEURIAL-REGULATION CASES .....	242
<b>REFERENCES.....</b>	<b>243</b>

## LIST OF TABLES

TABLE 1.	Characteristics Associated with Stronger Promotion Pride .....	52
TABLE 2.	Characteristics Associated with Stronger Self-Efficacy .....	55
TABLE 3.	Summary of Entrepreneur Cases .....	129
TABLE 4.	Summary of Manager Cases .....	130
TABLE 5.	Means, Standard Deviations and Correlations for Entrepreneurs .....	148
TABLE 6.	Means, Standard Deviations and Correlations for Managers .....	148
TABLE 7.	Entrepreneurial-Regulation Groups .....	151
TABLE 8.	Entrepreneurial-Regulation and Decision Styles .....	154
TABLE 9.	Entrepreneurial-Regulation and Entrepreneurial Career Choice.....	157
TABLE 10.	Entrepreneurial-Regulation and Opportunity Risk .....	163
TABLE 11.	Entrepreneurial-Regulation and Heuristics in Opportunity Evaluation and Exploitation .....	169
TABLE 12.	Entrepreneurial-Regulation and Decision Speed .....	179
TABLE 13.	Entrepreneurial-Regulation, Values and Ethics in Decision Making...	185



## LIST OF FIGURES

FIGURE 1.	Model of the Parent Literatures .....	27
FIGURE 2.	Model of Self-Regulation and Decision Making .....	59
FIGURE 3.	Model of Thesis as Concurrent Nested Strategy .....	124
FIGURE 4.	Model of Methodology and Methods .....	125
FIGURE 5.	Model of Entrepreneurial-Regulation and Opportunity Risk .....	167
FIGURE 6.	Model of Entrepreneurial-Regulation and Career Choice.....	201
FIGURE 7.	Model of Entrepreneurial-Regulation and Risk Taking.....	204
FIGURE 8.	Model of Entrepreneurial-Regulation, Values and Ethics in Decision Making.....	212

# **CHAPTER 1:**

## **INTRODUCTION**

### **BACKGROUND TO THE RESEARCH**

Research suggests that entrepreneurs are partly distinguished by their patterns of cognition and decision making and by the interaction of those factors within dynamic and uncertain environments (e.g., Baron, 2004a; Busenitz et al., 2003; Mitchell et al., 2004; Palich & Bagby, 1995; Shepherd & Krueger, 2002). Operating within such environments means that entrepreneurs are constantly faced with situations that generate a variety of complex decision tasks and significant cognitive load (Alvarez & Busenitz, 2001; Bhidé, 2000). Entrepreneurs therefore set and pursue goals under conditions of uncertainty and dynamic organizational emergence (Davidsson, 2005; Sarasvathy, 2001). In order to be effective in those environments, entrepreneurs need to be competent at monitoring and managing their own cognitions in stressful decision making situations (Bandura, 1997; Casson, 1997; Simon, Houghton, & Aquino, 2000). That is, entrepreneurs require effective skills of self-regulation, this being defined as systematic processes of thought and behavior that involve setting personal goals and steering oneself toward the achievement of those goals (Vancouver, 2000). Indeed, as Scott Shane (2003: 3) writes, “entrepreneurship is a self-directed activity that does not occur spontaneously from the presence of technological or industrial change.”

Furthermore, as Schumpeter (1934) famously argued, the goals typically pursued by entrepreneurs are inherently related to their processing of information in social and economic situations. That is, entrepreneurs identify new opportunities and create new

enterprises in market contexts. While Kirzner (1998), a more recent member of the Austrian School, maintains that entrepreneurial opportunities may emerge from the application of cognitive skills such as alertness to existing information. Through such means entrepreneurs imagine and identify opportunities, marshal human and other resources, then often establish new ventures to exploit those opportunities (Alvarez & Busenitz, 2001; Sarasvathy, 2002). Overall, these arguments suggest that decision making by entrepreneurs cannot be understood solely in terms of individual personality or cognition, but must incorporate the behaviors, processes and situational factors supporting opportunity identification, opportunity exploitation, and the emergence of new enterprises and organizational forms (Davidsson, Low, & Wright, 2001; Gartner, 2001; Low, 2001; Shane & Venkataraman, 2000b).

Assuming the fundamental significance of such situational factors, it follows that any adequate explanation of cognition and decision making by entrepreneurs must incorporate those factors. This view is consistent with a number of theoretical perspectives in the entrepreneurship literature, such as the resource-based view, the ecological perspective and the psycho-social explanation of entrepreneurship (e.g., Alvarez & Busenitz, 2001; Schoonhoven & Romanelli, 2001; Shane & Venkataraman, 2000b). For example, from an ecological perspective, communities and networks support entrepreneurial career choice and risk taking and encourage opportunity recognition and exploitation. These supportive environments include venture capitalists, research institutions and incubators within an integrated social ecology of entrepreneurial behavior and cognition (Aldrich & Martinez, 2001). Such ecologies are often found within specific geographic regions, most famously within Silicon Valley. Indeed, the preceding decade has seen in-depth study of such ecologies and how they encourage the emergence of new ventures and foster innovation (e.g., Baron, Hannan, & Burton, 2001a).

Recent research thus explores the complex frameworks of situational uncertainty, opportunity emergence, new enterprise formation, and entrepreneurial cognition and action (e.g., Frese, Brantjes, & Hoorn, 2002; Lichtenstein, Dooley, & Lumpkin, 2006; McMullen & Shepherd, 2006). At the same time, researchers investigate how entrepreneurs self-regulate thought and behavior to pursue opportunities within such environments (Baron, 2004a). However, it is not yet clearly understood how those self-regulatory processes function and interact within decision making, either among entrepreneurs (Busenitz et al., 2003) or among people more generally (Kanfer, 2005; Mischel & Shoda, 1998). In fact, these questions remain significant topics of research in social cognitive psychology (Higgins & Kruglanski, 2000; Van-Dijk & Kluger, 2004; Wrosch, Scheier, Miller, Schulz, & Carver, 2003). The same questions are addressed in this thesis.

These concerns place the study of entrepreneurship within the broader context of research on social cognition, self-regulation and decision making. Each field is characterized by a focus on complex processes, and how aspects of cognition and context interact with situational factors in determining behaviors. For example, having largely rejected the personality trait approach to entrepreneurship and the concomitant exclusion of environmental factors (see Low & MacMillan, 1988), recent scholarship has shown an increasing interest in the situated nature of entrepreneurial cognition and decision making (Davidsson et al., 2001; Mitchell, Busenitz, Lant, & McDougall, 2002; Mitchell et al., 2004). Numerous studies have thus located entrepreneurship within a social cognitive framework by exploring the role of self-efficacy, which is the belief in one's own ability to be efficacious in specific task domains (Bandura, 1997; Boyd & Vozikis, 1994; Chen, Greene, & Crick, 1998; Markman, Balkin, & Baron, 2002; Shepherd & Krueger, 2002). Others have noted the relevance of other aspects of social cognitive self-regulation for entrepreneurship (Baron, 2004a; Brockner, Higgins, & Low, 2003).

However, while some aspects of self-regulation by entrepreneurs have received attention, the overall process remains unclear and lacks a coherent theoretical framework. In addition, very few researchers have investigated the broader role of self-regulation in decision making by entrepreneurs (Baron, 2004a; Brockner, Higgins, & Low, 2004). Thus scholars call for studies that develop new, more synthesized theories about these phenomena (Busenitz et al., 2003; Shane, 2003). This thesis seeks to contribute towards theory building on this topic.

### **Key Definitions**

The definitions adopted by researchers often differ and that is the case regarding some of the key terms used in this thesis. It is therefore necessary to clarify key definitions of “self-regulation” and “entrepreneur” at the outset, especially because there are competing alternatives. These issues of definition will be discussed further in Chapters 2 and 3, where I shall review the literatures.

***Self-Regulation.*** Self-regulation is an important topic in social cognitive psychology. Social cognition is distinguished from non-social cognition by its focus on the interaction between social and cognitive variables. Social cognition seeks to study how people think about the social world and how that world influences the way people think. Social cognition underlies learning about what matters in the social world and thereby provides essential aspects of what it means to be human (Higgins, 2000b). Furthermore, in a world where organizational boundaries and networks are becoming more dynamic and societal, social cognition is increasingly relevant for management studies in general (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. There is also a general consensus that self-

regulation “involves cognitive, affective, motivational and behavioral components that provide the individual with the capacity to adjust his or her actions to achieve desired results in the light of changing environmental conditions” (Zeidner, Boekaerts, & Pintrich, 2000: 751). Self-regulation also incorporates regulatory orientation, which refers to the fundamental concerns or interests that guide self-regulation and underpin motivation systems (Higgins, 2002).

***Entrepreneur.*** There are a number of ways to define “entrepreneur” as an individual person, as distinct from definitions of entrepreneurship as a field or domain of enquiry (Davidsson, 2005). For example, some researchers define entrepreneurs in terms of behaviors, such as the founding of new ventures within a broader value creation processes (Bruyat & Julien, 2001; Zahra & Dess, 2001). They focus on the individual’s role in the recognition of new opportunities and the creation of new ventures to exploit them. Others argue that entrepreneurs are primarily distinguished by virtue of their psychological attributes, such as the intention to establish and manage a business for the purpose of profit and growth (Allinson, Chell, & Hayes, 2000). While some scholars of corporate entrepreneurship argue that even people who are employees within established firms can be described as entrepreneurs because they also identify and exploit new growth opportunities, albeit from within existing organizations (Kanter, 1993; Shane, 2003; Shepherd & Krueger, 2002). From a slightly different perspective, some scholars stress the dynamics of new markets and innovation, related environmental and economic factors, and the resources required to create new ventures in those situations (Alvarez & Busenitz, 2001; Thornton, 1999). From this viewpoint, entrepreneurs are key actors who bring critical human resources to the process of new enterprise emergence, whether as founders or employees (Baumol, 1993).

In this thesis, however, the emphasis is on the socio-cognitive attributes of entrepreneurs as individual decision makers, and the processes whereby these attributes interact with other personal and contextual factors in decision making. The thesis therefore defines an entrepreneur as an individual who has been directly involved in founding and managing a new venture to exploit a growth opportunity. The thesis thereby adopts the “person” rather than “organization” or “firm” perspective on the entrepreneurial process (Davidsson, Forthcoming). In addition, the thesis distinguishes managers from entrepreneurs by defining managers as individuals who have management roles but who have never founded their own business. The definitions thus adopted in this thesis do not preclude the significance of environmental, organizational and other socio-economic variables for individual psychology. Rather, these definitions identify the units of study that are most relevant for this thesis.

## RESEARCH QUESTIONS

The major research question of the thesis is this: *what is the role of self-regulation in decision making by entrepreneurs?* Based on the findings of the thesis, I will argue that self-regulation does indeed play a significant and complex role in such decision making processes. Indeed, the thesis provides evidence of a significant role for self-regulation in a number of important areas of decision making by entrepreneurs: decision styles, career choice, opportunity risk, the use of heuristics, the management of heuristic bias, decision speed, and the role of values and ethics in decision making.

These findings relate to a number of specific research questions. The first of those questions concerns the general nature of self-regulation among entrepreneurs as an identifiable group of individuals. Do they possess any special characteristics of self-regulation that set them apart from other groups, and especially from other groups of

managers (cf. Mitchell et al., 2004)? Therefore the first specific research question of the thesis is this:

### **Question 1**

***Do entrepreneurs possess a distinctive pattern of self-regulation?***

This general question about the self-regulatory characteristics of entrepreneurs relates to the general nature of entrepreneurial cognition and decision making styles. The literature suggests that strong versions of certain self-regulatory characteristics will predispose people towards more committed and strenuous goal pursuit, which is then translated into their approach to decision making. For example, sometimes they may be strongly intuitive in their decision making and rely more on past experience and a sense of right judgment. Alternatively, in other situations they may be strongly systematic in their decision making and employ more deliberate information search and analysis. These claims are reflected in the next research question.

### **Question 2**

***What is the influence of self-regulation on decision making styles among entrepreneurs?***

The first two questions bear directly on the reasons why some people choose to become entrepreneurs in the first place. That is, given that self-regulation is defined in terms of setting goals and directing oneself towards the achievement of those goals, then deciding to become an entrepreneur can be viewed as an important act of self-regulation. Theories of work motivation and career choice are therefore closely related to self-



regulation theory (Carver & Scheier, 1998; Vancouver & Day, 2005). Thus, the third specific research question is this:

### **Question 3**

***What role does self-regulation play in entrepreneurial career choice?***

Additional research questions refer to the major decisions that entrepreneurs typically make in the pursuit of their chosen career. Firstly, scholars in the field regard opportunity evaluation and exploitation as critical areas of decision making for entrepreneurs (e.g., Choi & Shepherd, 2004; Davidsson et al., 2001; Shane & Venkataraman, 2000b). The first of these two critical phases of the entrepreneurial decision making process – opportunity evaluation – involves the assessment of whether or not to pursue a new opportunity or venture idea. Subsequently, if an opportunity is judged to be worthwhile, then the evaluation stage culminates in a decision actively to pursue it. I refer to the first phase of the decision making process as opportunity evaluation. The second phase of the process then begins as entrepreneurs seek to exploit the opportunity operationally over time. I will refer to this second phase of the decision making process as opportunity exploitation.

Researchers investigate the cognitive and other personal factors involved in the decision making processes regarding opportunity evaluation and exploitation. Many report that those critical decisions are often made under pressure with limited time or information (Busenitz et al., 2003; Shaver & Scott, 1991). Thus, entrepreneurs have been observed to rely on intuition based on prior experience and exemplars when selecting opportunities and deciding how to exploit them (Allinson et al., 2000; Sadler-Smith, 2004). Researchers in cognitive psychology argue that this kind of decision making under pressure in dynamic

situations demands advanced self-regulatory functioning (Bandura, 1997; Grant & Higgins, 2003; Wood, Atkins, & Tabernero, 2000). This leads to the fourth research question:

**Question 4**

***What role does self-regulation play in decision making by entrepreneurs about the evaluation and exploitation of new opportunities?***

Another important aspect of decision making about opportunities is the use of heuristics, defined as cognitive short-cuts. Some scholars argue that entrepreneurs typically use heuristics to identify and exploit new opportunities, because otherwise high cognitive load and lack of information would mean that such decisions are rarely made (e.g., Gaglio, 2004). Indeed, some scholars argue that entrepreneurs are significantly distinguished by their use of heuristics (e.g., Busenitz & Barney, 1997; Mitchell, Smith, Seawright, & Morse, 2000; Simon & Houghton, 1999), although this remains a subject of dispute (cf. Miner & Raju, 2004). More generally, the critical role of heuristics in decision making is a major area of study and debate across a range of disciplines (Gilovich & Griffin, 2002) and especially in behavioral economics (Kahneman & Tversky, 2000a). Leading social cognitive psychologists also argue that self-regulation plays a significant role in the use of heuristics (Bandura, 1997; Higgins, 2000b; Karoly, 1993), this view leading to the fifth research question:

**Question 5**

***What role does self-regulation play in the use of heuristics in decision making by entrepreneurs?***

The next research question also relates to the use of heuristics, but specifically to the contentious issue of heuristic bias. There is a substantial body of research, largely based on seminal work by Kahneman and Tversky (1979; 2000a), which shows that psycho-social stressors can result in extreme heuristic bias and cognitive errors in decision making. This has spawned studies across a wide range of disciplines, including negotiation theory and behavioral economics (Neale & Bazerman, 1985; Thaler, 1999). It has also stimulated research into decision making by entrepreneurs and especially in relation to decision making in stressful and dynamic entrepreneurial situations (Baron, 1998; Busenitz & Barney, 1997; Simon & Houghton, 2002). Such pressures may result in biases such as the illusion of control, belief in the law of small numbers, and reasoning by analogy when deciding which opportunities to pursue (Forlani & Mullins, 2000; Simon & Houghton, 2002). Regarding the topic of this thesis, there is evidence that effective self-regulation may limit the errors arising from bias in decision making (Gigerenzer, 2000; Payne & Bettman, 2001). This prompts the sixth research question:

### **Question 6**

***What is the role of self-regulation in the management of heuristic bias in decision making by entrepreneurs?***

Stressors also impact on the nature and speed of decision making. In particular, decision making under time pressure promotes the use of heuristics and more adaptive decision making (Gigerenzer, 2000). Alvarez and Busenitz (2001) argue that heuristics play exactly this function by enabling entrepreneurs to make faster decisions under conditions of uncertainty and ambiguity. However, the same pressures can also lead to heuristic bias and cognitive error, and especially in the fast-paced dynamic situations often

experienced by entrepreneurs (Baron, 1998). Decision speed is also related to self-regulatory factors. For example, studies have shown that a person's self-regulatory orientation and self-efficacy promote greater eagerness and confidence which in turn drive faster decision making (Bandura & Locke, 2003; Förster, Higgins, & Bianco, 2003). This prompts the seventh research question:

### **Question 7**

***Does self-regulation influence the speed of decision making by entrepreneurs?***

The final research question addresses a different although closely related aspect of decision making, namely the role of values and ethics. It is argued that entrepreneurs are people of vision, driven by ambitious goals, sometimes imbued with stronger purpose, seeking to build and create value both for themselves and the societies in which they live and work (Brenkert, 2002; Mintzberg, Ahlstrand, & Lampel, 1998; Sarasvathy, 2002). These attributes and behaviors entail values and ethics, some of which are personal, others social, and all relevant for the pursuit of entrepreneurial goals. At the same time, working from different perspectives, social psychologists report that values are intrinsic to self-regulated goal setting and decision making in goal pursuit (Brett, Northcraft, & Pinkley, 1999; Carver & Scheier, 1998; Higgins, 2002). Yet this reported relationship between values, ethics and self-regulation has not been explored in the context of decision making by entrepreneurs. This gap in the literature prompts the final research question:

### **Question 8**

***What is the relationship between self-regulation and the use of values and ethics in decision making by entrepreneurs?***

I will report a number of significant findings in response to these eight research questions. Regarding the first question, the thesis suggests that entrepreneurs are not significantly different to managers in terms of self-regulation. Nonetheless, the findings suggest that self-regulation varies between different sub-groups of entrepreneurs; that is, entrepreneurs are heterogeneous with respect to their self-regulatory characteristics.

Regarding the second research question, the findings suggest that entrepreneurs exhibit different decision making styles depending on the nature and relative strength of their self-regulatory characteristics. This finding makes a number of contributions. Firstly, it adds to the literature on entrepreneurship by suggesting additional distinctive characteristics of entrepreneurs, while also reinforcing the view argued by others that entrepreneurs cannot be treated as a homogenous group (Davidsson, 2005; Forbes, 2005a; Sarasvathy, 2004a). Secondly, the finding suggests that different aspects of self-regulation may be deeply related within socially embedded task domains. This finding therefore makes a contribution to the literature on self-regulation.

Regarding the third research questions about career choice, and the fourth concerning opportunity evaluation and exploitation, the findings suggest that self-regulation plays a complex role, depending on the relative nature and strength of an entrepreneur's self-regulatory characteristics. In particular, entrepreneurs who possess stronger self-regulation appear to have more complex strategic reasons for choosing an entrepreneurial career and for selecting which opportunities to pursue. They also tend towards more risky decision making, adopt longer term strategic choices, and show greater self confidence and purpose in making such decisions. These findings constitute a significant contribution to the literature on entrepreneurship, in terms of who chooses to become an entrepreneur and why. The findings also make a minor, although meaningful contribution to the strategic decision making literature, by showing that self-regulation

may play a role in strategic decision making in dynamic fast-paced environments (cf., Brown & Eisenhardt, 1998). Overall, the main contribution is to suggest that self-regulatory factors play a significant role in entrepreneurial decision making and may also do so in managerial decision making more generally.

Concerning the fifth research question that focuses on the use of heuristics in decision making by entrepreneurs, the thesis finds that entrepreneurs with stronger self-regulatory characteristics use heuristics more often, and especially heuristics related to finding good fit with longer-term strategic goals (cf., Baron, 2004a). Regarding the sixth research question concerning the management of heuristic bias, the findings suggest that some entrepreneurs are acutely aware of potential bias and error and take deliberate, self-regulated compensatory steps when using heuristics.

Therefore, in contrast to the major theoretical literature on this topic (e.g., Kahneman & Tversky, 2000a), the thesis finds that strong self-regulatory characteristics informed by domain expertise can be protective against heuristic bias. This constitutes a contribution to the literature on decision making by entrepreneurs, where the major focus has been on issues relating to heuristic bias (Baron, 1998; Busenitz et al., 2003). In fact, the thesis also makes a minor contribution to the broader decision making literature itself, in that the findings provide empirical support to scholars who argue that heuristics can be effective, albeit boundedly rational, decision means (Gigerenzer & Selten, 2001).

The seventh research questions concerns the relationship between self-regulation and decision speed. The thesis finds that entrepreneurs with stronger self-regulatory characteristics tend to make faster decisions, and often employ heuristics in doing so. This constitutes a contribution towards the literature by suggesting some of the psychological mechanisms which enable entrepreneurs to make faster decisions. The findings suggest

that similar mechanisms may also enable managers to make effective decisions in fast-paced environments (cf. Brown & Eisenhardt, 1997).

The final research question focuses on values and ethics in decision making. The findings suggest that there is a positive relationship between entrepreneurs' self-regulatory characteristics and their use of values and ethics in decision making. Those with stronger self-regulation display a deeper concern with values in goal setting, incorporate ethical standards into goal pursuit, and then evaluate themselves against such criteria. By uncovering such evidence, the thesis makes a contribution to the literature on entrepreneurship, where the role of values and ethics in decision making is still relatively unexplored (Hannafey, 2003). The same findings also constitute contributions to the literatures on self-regulation and decision making.

## **RATIONALE FOR THE RESEARCH**

The research questions of this thesis mirror the growing interest in self-regulation across a range of disciplines. For example, research into self-regulation has focussed on individuals as leaders and decision-makers, as team members and as employees with varying degrees of work motivation (Carver & Scheier, 1998; Hiller & Hambrick, 2005; Kanfer, 2005; Wood, 2005). Self-regulation has also become a topic of interest in decision making theory, as scholars continue to explore the nature and scope of rationality and choice (Vancouver & Day, 2005). Collectively, these research programs reflect the increasingly dynamic nature of contemporary organisational environments, the demand for more adaptive individual thought and behavior within them, and the importance of self-directed goal pursuit (Brown & Eisenhardt, 1998; Child & McGrath, 2001).

The same concerns infuse the field of entrepreneurship as an area of study into management within dynamic business environments. Scholars of entrepreneurship explore

the psycho-social attributes of entrepreneurs as founders, leaders, managers and decision makers in dynamic situations of new enterprise emergence (Shane, Locke, & Collins, 2003; Shaver, Gartner, Crosby, Bakalarova, & Gatewood, 2001). However, a number of leading scholars point to current gaps in this research. In particular, they identify the need for empirical studies into the role of self-regulation in entrepreneurship and especially the influence of self-regulation on entrepreneurial cognition, decision making and goal-directed behavior (Baron, 2004a; Baron & Ward, 2004; Brockner et al., 2004).

Some research has already been conducted in this area. A number of scholars have investigated the role of self-regulation in entrepreneurship in terms of self-efficacy (e.g., Chen et al., 1998; Forbes, 2005b; Markman et al., 2002; Scherer, Adams, Carley, & Wiebe, 1989). In addition, two recent PhD theses in entrepreneurship have investigated one of the self-regulatory factors included in this thesis, namely regulatory focus (see Hmieleski, 2005; McMullen, 2003). However, unlike my thesis, neither of these earlier theses employed qualitative methods to explore decision making at the individual person level. Rather, they investigate testable hypotheses across larger population samples using sophisticated quantitative techniques. So the fact remains that there are no qualitative or mixed method studies that have investigated the combined effect of multiple self-regulatory factors across the range of decision making tasks which characterize the entrepreneurship domain. This thesis addresses that gap.

The thesis also makes a tentative contribution towards professional practice in the field of entrepreneurship. Investors, consultants and entrepreneurs themselves, all have a strong interest in understanding the motivations and decision making processes of entrepreneurs (Miner, 1997). For example, investors often seek to assess the risk propensity and relevant decision making capability of individual entrepreneurs as much as the potential markets and products (Forlani & Mullins, 2000). As a further example,



investors often use share options to enhance entrepreneurial behavior and may do so assuming an agency theory perspective on behavior. However, those perspectives rarely capture the underlying motivations, cognitive frameworks and self-regulatory aspects of entrepreneurship (Arthurs & Busenitz, 2003; Wright, Mukherji, & Kroll, 2001). Thus, insofar as this thesis helps to deepen understanding of those processes and how they might be improved, it may be of significant practical relevance as well.

These issues are especially relevant to ongoing debates about the character and coherence of the field of entrepreneurship (see Davidsson et al., 2001; Low, 2001; Shane & Venkataraman, 2000b). In particular, having largely rejected the personality trait approach to entrepreneurship, recent scholarship in the field has witnessed an increasing interest in entrepreneurial cognition and decision making as defining characteristics (Mitchell et al., 2002). In this spirit, and reflecting the significance of social cognition generally, some scholars have argued that entrepreneurs are distinguished by their social cognitive and decision making processes (Baron, 2004a; Palich & Bagby, 1995; Shepherd & Krueger, 2002).

However, prior research into these topics has been limited in its approach and methodology (Busenitz et al., 2003). Most scholars have chosen conventional quantitative approaches that may not uncover the deeper complexities of entrepreneurial behavior and cognition in their situational context (Ucbasaran, Westhead, & Wright, 2001). Thus, scholars have called for more varied methodologies to research such topics, including qualitative and mixed methods case studies (Bruyat & Julien, 2001; Davidsson, 2005; Gartner & Birley, 2002b; Zahra & Dess, 2001). Organisational psychologists have called for similar approaches to self-regulation research (Wood, 2005). This thesis follows their recommendations by adopting a mixed methods approach which combines both quantitative and qualitative techniques.

## METHODOLOGY

The choice of methodology for the thesis is contextualized by substantial bodies of literature regarding self-regulation, decision making and entrepreneurship as separate fields of study. However, very few studies have explored the intersection of those three fields, creating something of a conundrum. While we already know a significant amount about the separate topics of entrepreneurship, self-regulation and decision making, we know very little about their deep interactions. This state of current knowledge has methodological implications. On the one hand, we already know too much to warrant a grounded theory approach; that is, substantial theories of self-regulation, decision making and entrepreneurship already exist. On the other hand, we know little about the functioning of self-regulation in decision making by individual entrepreneurs, which constrains the formulation of testable hypotheses about these processes (Baron & Ward, 2004).

Nonetheless, sophisticated theories in the fields of self-regulation and decision making provide a solid foundation for developing new theories about self-regulation in decision making by entrepreneurs. Indeed, the development of new theories that build on borrowings from other disciplines has been advocated by scholars of entrepreneurship (Davidsson, 2005; Low, 2001; Shane, 2003). The recent entrepreneurship literature suggests that more qualitative and mixed methods case studies could be a promising way to achieve that goal (Davidsson & Wiklund, 2001a; Gartner & Birley, 2002b; Hindle, 2004; Lyon, Lumpkin, & Dess, 2000; Zahra & Dess, 2001). Indeed, there has been a lack of qualitative studies which explore the lived experience of entrepreneurs, and which may uncover hitherto unrecognized levels of complexity and heterogeneity among this population. As Sarasvathy (2004a:529) writes regarding entrepreneurship research, “we need to turn to more qualitative analyses than we are currently prone to do.”

In response, I chose to adopt an exploratory mixed methods multiple case study approach, including both semi-structured interviews and a survey questionnaire. The survey component of the thesis is based upon existing theories in the field of self-regulation where scholars have already investigated the relation of self-regulation to aspects of decision making. Using existing instruments, the survey measures two important self-regulatory characteristics of 30 entrepreneurs and 30 managers. While the semi-structured interview component seeks to investigate the specific situational nature of decision making by the same 30 entrepreneurs. The entrepreneurs and managers are treated as two groups of multiple cases.

The thesis is exploratory and guided by a set of formal propositions which are developed from the review of the topic literature in Chapter 3. These propositions are not framed as testable hypotheses, but serve as guides for exploratory research. This is the approach recommended by Robert Yin, one of the leading experts on case study research. He writes that case study research can gather both qualitative and quantitative evidence, and that such research “benefits from the prior development of theoretical propositions to guide data collection and analysis” and that “each proposition directs attention to something that should be examined within the scope of study” (1994:14). Yin adds that, “when an embedded design is used, each individual case study may in fact include the collection and analysis of highly quantitative data, including the use of surveys within each case” (1994:51). This thesis adopts a similar approach. The thesis is therefore an example of research that integrates both qualitative and quantitative methods as mixed methods, explores relatively narrow propositions or questions, includes multiple cases that are purposively selected, and studies embedded processes within and across cases (Babbie, 2001; Greenberg & Folger, 1988; Seale, 1999; Singleton & Straits, 1999).

Mixed method, multiple case studies of this kind have been recognized for some time (Morse, 2003; Yin, 1994). Indeed, mixed methods have become increasingly popular within social research, where they are used to explore and identify the relations and interactions among psychological and strategic variables in real social structures (Bryman, 1988; Currall & Towler, 2003; Greenberg & Folger, 1988; Layder, 1993; Perry, 1998; Scandura & Williams, 2000). That rationale also underpins the choice of mixed methods for this study, which explores self-regulation and decision making among entrepreneurs as complex, socially embedded psychological processes.

However, the adoption of mixed and multi methods has been slower in management studies, although there are some notable examples. For example, the *Academy of Management Journal*, arguably the world's premier journal for empirical studies in management research, has published a number of articles in recent years which combine both quantitative and qualitative techniques in ways that are similar to the approach adopted in this thesis (e.g., Boland Jr. et al., 2001; Maritan, 2001; Mohrman, Gibson, & Mohrman Jr., 2001). I will return to these examples from the literature in Chapter 4, where I explain the methodology of the thesis in greater detail.

Regarding the survey component of the thesis, it measures two distinct, but related self-regulatory constructs: chronic regulatory focus (also termed regulatory pride) (Higgins et al., 2001) and self-efficacy (Bandura, 1997). Regulatory focus describes the nature of a person's motivation towards desired end-states, which can be either to attain gains or avoid losses (Higgins & Silberman, 1998). In this study, I focus on the chronic form of regulatory focus known as regulatory pride. This aspect of self-regulation is predominantly a distal component of a person's psychology, in the sense that it is a chronic attribute and not heavily dependent on situational factors (Davidsson, 2005). The second aspect of self-regulation that is investigated in this thesis is self-efficacy, which describes a person's

sense of their own capability to achieve their goals and accomplish related tasks (Bandura, 1997). Self-efficacy is a more proximal component of a person's psychology, in the sense that it is significantly dependent on situational factors and on a person's experience in a particular task domain.

Together, regulatory pride and self-efficacy cover many of the key attributes of self-regulation, namely self-reference, motivation systems, goal frameworks, affective attributes (insofar as they impact on motivation and intention) and related cognitive capabilities (Zeidner et al., 2000). Thus, when combined, regulatory pride and self-efficacy capture the essence of self-regulation, previously defined as a systematic process of human thought and behavior that involves setting personal goals and steering oneself toward the achievement of those goals. The combination of related constructs in this way is recognized as an appropriate way of developing new theory in organizational studies (Bacharach, 1989a; Whetten, 1989).

Regarding sample selection, the main study group consists of 30 entrepreneurs conceived as both a set of multiple cases (from a qualitative perspective) and a small non-population sample (from a quantitative perspective). All subjects were purposively selected to exhibit maximum variation across the processes identified in the research questions. The major unit of study is the entrepreneur as the founder and key decision maker within a new enterprise or venture. The cases were drawn from a range of industry sectors. Some had been entrepreneurs for many years and become very successful. Others were novices and yet to prove themselves as entrepreneurs. A few had already failed in founding a venture and were trying again. The resulting sample displayed relative homogeneity in terms of their basic characteristics as founder entrepreneurs, yet at the same time they could display heterogeneity in terms of self-regulatory and other psycho-social attributes (cf., Davidsson, 2005).

In order to strengthen the validity of the thesis, I also recruited a control group of 30 managers from comparable industries who had not founded a business. The intention was to recruit a control group who shared all the key characteristics of the entrepreneur group, except they had never been founders themselves. It should be noted that the use of managers as comparators for entrepreneurs remains problematic (Davidsson, Forthcoming). For example, studies which compare entrepreneurs and managers often fail to control for key situational variables such as type of industry and market (Shane, 2003). In this thesis, the samples are selected in order to minimize problems of this kind, and the major findings of the thesis do not rely heavily on the results of this comparative analysis.

In terms of analytic techniques, the survey data are analyzed using descriptive statistics and nonparametric correlations. The interview data are separately analyzed for themes and codes. The survey data are subsequently transformed to derive a qualitative ranking of entrepreneurs in terms of their relative self-regulatory characteristics. The two sets of data sets are then combined following established principles of mixed methods analysis (Creswell, 2003). Having combined the data, the coded interviews can then be interrogated in terms of the interviewees' self-regulatory characteristics. This approach strengthens the robustness and trustworthiness of the findings, reflecting underlying principles which are broadly post-positivist, rather than classically positivist or interpretivist (Lincoln & Guba, 1985; Morse, 2003; Singleton & Straits, 1999).

## **OUTLINE OF THE THESIS**

The structure of the thesis is as follows. The present chapter is introductory and summarizes the major elements of the thesis. It outlines the research questions, key concepts and methodology. It also explains the rationale and significance of the thesis within the field of entrepreneurship.

Chapter 2 contains a review of the parent literatures of entrepreneurship, self-regulation and decision making. Each of these fields has a substantial literature in its own right. They are closely related, but in many respects they warrant separate attention. This chapter will therefore review the major research streams within each literature, as well as discussing their common themes.

Chapter 3 focuses on the literature of decision making by entrepreneurs. It will also relate this specific literature to the literatures reviewed in Chapter 2. Based on the literature reviews in Chapters 2 and 3, I will develop a number of exploratory propositions that relate those literatures to the research questions of this thesis.

Chapter 4 explains the research design and methodology of the thesis. As stated earlier, this thesis is exploratory. It is a mixed methods study of embedded processes. While this methodology is not without precedents, it remains novel and unusual in studies of entrepreneurship. In fact, most entrepreneurship research is either qualitative or quantitative and the two approaches are rarely combined to any significant degree. Therefore, this chapter will include a detailed explanation and justification of the chosen mixed methods approach. It will also explain the case selection technique, the survey instrument used, and the semi-structured interviews that were conducted with the participating entrepreneurs covering numerous aspects of decision making. This chapter will also discuss the issues of validity and reliability.

Chapter 5 reports the findings derived from analysis of the data. The survey data are analyzed using descriptive statistics and nonparametric correlation tests. Results suggest that entrepreneurs as a group do not possess a distinctive pattern of self-regulation when compared to managers. However, the results also suggest that there are significant within-group differences among entrepreneurs, and these results are the basis for grouping the entrepreneurs in terms of strong, moderate and weak self-regulatory characteristics.

Chapter 5 also reports the findings from analysis of the interview data achieved using thematic coding and cross-case analysis techniques. After initial coding analysis was complete, the coded interviews were arranged into groups of strong, moderate and weak self-regulatory characteristics, based on the results of the survey analysis described in the preceding paragraph. Having grouped the interviews into these three categories, they were further analyzed. A major finding is that entrepreneurs with stronger self-regulatory characteristics appear to be more positive, confident and committed in making risky decisions, use heuristics more effectively, and make faster and more purposive decisions in relation to their goals.

Chapter 6 contains a discussion of the empirical findings and their theoretical implications for the three literatures of entrepreneurship, self-regulation and decision making. The chapter will also acknowledge and discuss the limitations of the findings. Indeed, owing to the non-random small samples in the thesis, the findings do not imply conclusions about populations of entrepreneurs or managers. The implications drawn are therefore tentative. Nonetheless, given that caveat, I will argue that the thesis makes a number of original contributions to knowledge in the fields of entrepreneurship, self-regulation and decision making. Chapter 6 also explains the implications for future research and especially in the field of entrepreneurship, and finally concludes the thesis.

### **DELIMITATIONS OF SCOPE AND KEY ASSUMPTIONS**

As stated earlier, this thesis is exploratory and neither formulates nor tests specific hypotheses. Indeed, given that the data are drawn from non-random, non-population samples, the results cannot be used to make any statistically based claims about populations of entrepreneurs or managers. Rather, the thesis explores the relationship between self-regulation and decision making by entrepreneurs, and thus seeks to contribute



towards future theory development. For those reasons, the thesis studies a purposively selected non-population sample of 30 entrepreneurs, plus a control group of 30 managers. Smaller samples allow for more in-depth exploration.

The entrepreneur sample was purposively selected using a maximum variation technique to capture and describe the central themes that cut across the full range of possible variations (Patton, 1990). In that sense, the technique reflects an acceptance of pluralism and complexity (cf. Bruyat & Julien, 2001; Eisenhardt, 2000). However, because the sample is drawn from one geographic region in and around Sydney, Australia, key regulatory and environmental conditions are held constant, as well as some of the situational and environmental variables that may influence socio-cognitive self-regulation. For the same reasons, however, the results are limited in applicability to different markets and cultures. That is because cultures have particular attributes that can influence aspects of organizational design, social cognition and decision making (Freeland, 1997; Morris & Fu, 2001; Wennekers, Wennekers, Thurik, & Reynolds, 2005).

As noted earlier, the thesis focuses on the attributes of entrepreneurs as individual decision-makers, rather than wider organizational or contextual variables. Therefore, this thesis adopts a psycho-social approach and defines an entrepreneur as someone who has been directly involved in founding and managing a new venture. However, by adopting this definition and research design, the thesis deliberately limits the scope of the thesis and the data it seeks to gather and analyze.

Furthermore, the thesis is not a longitudinal study, but investigates self-report data from a narrow time frame. Nor does the thesis explore all the various sociological and organizational levels of the decision making process. Therefore the thesis is constrained in terms of its potential findings and implications. For example, it does not claim to study the changing patterns of self-regulation and decision making that may occur as entrepreneurs

accumulate more experience over time. Nor can it show whether entrepreneurs possess their distinctive patterns of self-regulation and decision making prior to becoming entrepreneurs or whether they acquire those characteristics through subsequent experience. If it could be shown that they possessed these characteristics prior to becoming entrepreneurs, then such personal attributes could be a predictor of entrepreneurial career choice. However, that cannot be determined by this thesis.

## **CONCLUSION**

The first section of this chapter explained the background to the thesis. Like other contemporary research in entrepreneurship, the thesis seeks to explore and understand how entrepreneurs think and make decisions within dynamic, uncertain and risky environments. In particular, the thesis responds to the recent call by a number of leading scholars, that more exploratory research is required into the role of self-regulation in decision making by entrepreneurs (Baron, 2004a; Brockner et al., 2004).

Having adopted that broad research topic, the second section then identified the eight research questions that this thesis will address. They covered self-regulation as a potentially defining characteristic of entrepreneurs and the role of self-regulation in a number of important areas of decision making by entrepreneurs. This section also summarized the study's key findings and contributions to knowledge.

In the third section, the rationale for the study was provided. Based upon an overview of the three subject literatures – entrepreneurship, self-regulation and decision making – I argued that the thesis addresses important and highly relevant questions in each field. I then explained that the thesis could result in practical implications. Further justification for the thesis was derived from the study's use of mixed methods, which responds to a noted gap in prior research design.

That methodological approach was then explained in greater detail in the fourth section of this chapter. By combining both quantitative and qualitative techniques as mixed methods, the study aims to explore the intersection of existing theories of self-regulation and decision making with the situational contingencies of entrepreneurship. Noting the inherent benefits and limitations of mixed methods, the fifth section of this chapter provided delimitations of the thesis' scope and its key assumptions.

The final section of this chapter outlined the contents of the other five chapters. Chapter 2 reviews the three parent literatures, Chapter 3 reviews the specialized literature on decision making by entrepreneurs, Chapter 4 explains the research method in detail, Chapter 5 reports the findings of the study, and Chapter 6 includes a discussion of the implications of the study for scholarship and future research.

## CHAPTER 2:

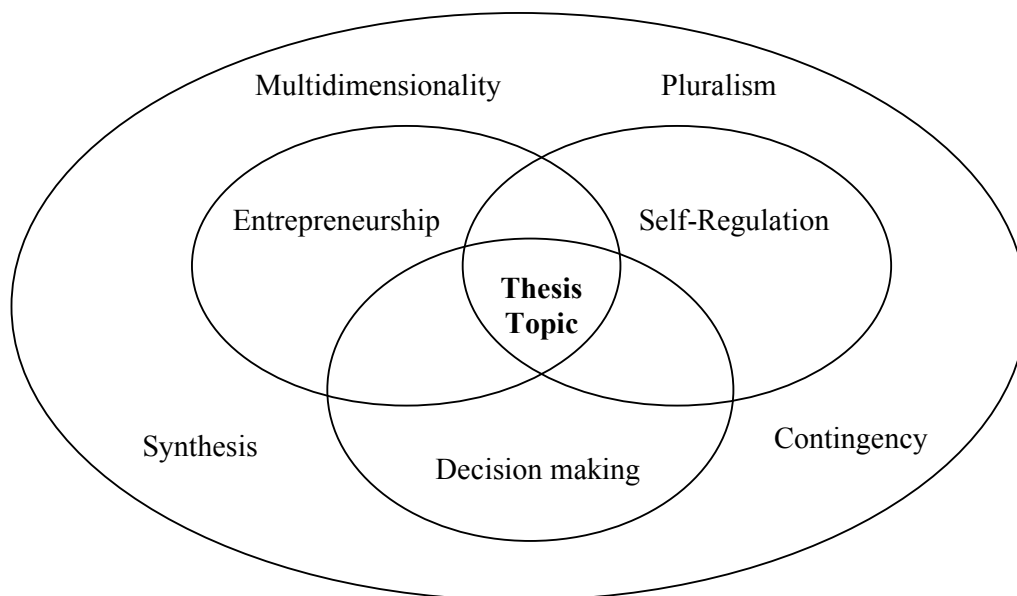
# LITERATURE ON ENTREPRENEURSHIP, SELF- REGULATION AND DECISION MAKING

### INTRODUCTION

Chapter 1 introduced the study's three parent literatures: entrepreneurship, self-regulation and decision making. Each is a distinct area of study with its own trends and debates. At the same time, they share a number of major themes: a trend towards theoretical and methodological pluralism, a related search for synthesizing frameworks and theories, an increasing interest in multidimensional theories and approaches, and a growing recognition of the fundamental contingency of human cognition and behavior. The parent literatures and their shared themes are depicted in the model in Figure 1.

**FIGURE 1**

**Model of the Parent Literatures**



In this chapter, I will review the parent literatures individually and provide a general overview. The first section of the chapter will discuss the major themes that are common to all three literatures. The second, third and fourth sections will present overviews of each literature. In the following chapter, I will relate the parent literatures to the specific topic of this thesis, namely the role of self-regulation in decision making by entrepreneurs.

## **MAJOR THEMES**

While each of the parent literatures has its own debates and theoretical concerns, they all share a number of common themes. Four such themes will be discussed here: theoretical and methodological pluralism, the search for more synthesizing theories, the acknowledgement of multidimensionality, and the recognition of contingency. Each is briefly discussed in this section.

### **Pluralism**

The first major theme is that of theoretical and methodological pluralism. Each literature has seen a growing trend towards a plurality of research paradigms, methodologies and theoretical constellations. In most cases, pluralism has emerged in response to the need to explain the inter-related complexity of observed phenomena (Eisenhardt, 2000). Within entrepreneurship, this is evidenced by greater borrowing from other areas of management studies and social science (Busenitz et al., 2003; Davidsson et al., 2001; Swedberg, 2000; Zahra & Dess, 2001). In the literature on self-regulation, there is increasing focus on a wide range of psycho-social processes that contribute to self-regulation (Karoly, Boekaerts, & Maes, 2005; Zeidner et al., 2000). Within the literature on decision making, this trend can be seen in the growing interest in behavioral decision

making and the incursion of psychological and organizational research methods (Cyert & March, 1992; Schwartz, 2002).

### **Search for Synthesis**

The second common theme is the search for greater synthesis between theoretical perspectives and models. This theme is closely related to pluralism but sometimes contradicts it. That is because synthetic theories typically seek to construct frameworks in which all components are related and inter-dependent, whereas pluralistic approaches may propose loose frameworks covering a multiplicity of theories that are not closely integrated (Eisenhardt, 2000). Both approaches are evident across the three literatures discussed here. The main point to note, however, is that scholars across all three fields are seeking to draw on distinct theories that help to explain related phenomena.

Within the entrepreneurship literature, for example, scholars propose theories that incorporate elements from cognitive psychology, behavioral economics and resource-based theories of the firm (e.g., McMullen & Shepherd, 2006; Shane, 2003; Zahra & Dess, 2001). However, some explicitly reject the search for tightly integrative theories of entrepreneurship and its sub-processes, instead viewing entrepreneurship as a field of study which unites communities of scholars around shared research questions (e.g., Alvarez & Busenitz, 2001; Gartner, 2001). Such scholars are content with the pragmatic use of distinct theories without an overall synthesizing framework.

The decision making literature, on the other hand, has a very rich history of sophisticated, integrative theoretical frameworks. In this literature, it is common to find tightly integrated theories that seek to encompass the entire field (Simon, 1992). Indeed, theoretical ambitions of this kind are at the heart of the ongoing debate between behavioral economists and their more classically inspired colleagues (e.g., Gigerenzer, 2000; Kahneman & Tversky, 1996).

Synthetic projects are also common in the literature on social cognitive self-regulation. In this field, a number of leading scholars have proposed theoretical frameworks that seek to encompass all the relevant factors associated with self-regulation (e.g., Bandura, 1997; Carver & Scheier, 1998; Karoly, 1993; Murtha, Kanfer, & Ackerman, 1996). Mischel (2004) recently argued for an integrative science of the person encompassing social cognition, self-regulation, personality and situational factors. None of these proposals has yet gained universal acceptance, partly owing to the relative youthfulness of the field (Karoly et al., 2005). However, some scholars hope and expect that a normative theory of self-regulation can be developed over time (Zeidner et al., 2000).

### **Multidimensionality**

The broad trends towards pluralism and synthesis are both related to multidimensionality and multi-level theorizing. That is, a plurality of theories and the attempt to synthesize them will most probably entail multiple levels and dimensions of analysis, and especially in the field of entrepreneurship (Davidsson & Wiklund, 2001b; Low & MacMillan, 1988; Phan, 2006). In the case of entrepreneurship, such dimensions include market dynamics, technological innovation, organizational forms and individual psychology (Baum, Locke, & Smith, 2001; Markman et al., 2002). This range of phenomena then entails a plurality of theoretical approaches, such as “decision theory, start-up factors of production, information processing and network theory and temporal dynamics” (Busenitz et al., 2003:285). It also entails multiple theoretical lenses and dimensions of analysis, such as the macro socio-economic level, the market level and the micro organizational level of individual firms and actors (Covin & Slevin, 1991). In their seminal article, Low and MacMillan (1988) recommended more multilevel studies across a broader range of psycho-social dimensions. Those levels or dimensions of analysis also

correspond to a plurality of disciplines and theoretical approaches. For example, socio-economic levels of analysis would typically adopt sociological and economic theories. On the other hand, psychological theories would normally be employed at the level of individual entrepreneurs. Similar patterns can be observed in the study of self-regulation and decision making. Scholars in both fields are increasingly aware of the need for multidimensional approaches to those phenomena as well (Karoly et al., 2005; March, 1997; Wood, 2005).

### **Contingency**

The fourth major theme in the literature is a growing recognition of the contingent nature of human cognition and behavior. Scholars in each of the fields covered in this thesis increasingly recognize that cognition and behavior involve both generic and situational factors which are socially embedded and conditioned (e.g., Child & McGrath, 2001; Davidsson, 2005; Mischel & Shoda, 1995; Schwartz, 2002).

For example, in the entrepreneurship literature, scholars have recently argued for more studies that explore the situational nature of entrepreneurship (Shane, 2003; Shane & Venkataraman, 2000a) and its inherent contingency (Sarasvathy, 2001). Consequently, they argue against one-dimensional frameworks for the field, whether they are cognitive, resource-based or grounded in economic theory. A similar trend is evident in scholarship on decision making. Once again, some scholars have argued that approaches which seek to apply universal standards of rationality or subjective expectancy cannot capture the situational variance and contingency of actual decision making (Gigerenzer, 2000; Thunholm, 2004). Instead, they call for more sophisticated theories which acknowledge the inherently situational nature of decision making.

The same is true for the literature on self-regulation. In this emerging area of study, a variety of scholars from different fields support a situational approach (Mischel & Shoda,



1995; Murtha et al., 1996). That is, they regard self-regulation as a feature of each person's unique psycho-social makeup, embedded in the contingent world of personal development and experience. However, they do not deny that there are common features of self-regulation, but rather that these features must be understood in relation to contingent, situational patterns (e.g., Hull, 2002).

In the following sections of this chapter, I will review each parent literature in the light of their shared concern with pluralism, synthesis, multidimensionality and contingency.

## **ENTREPRENEURSHIP**

The most important and contentious debate within the entrepreneurship literature continues to be its coherence and integrity as a distinct field of study (Shane & Venkataraman, 2000a; Zahra & Dess, 2001). To date, entrepreneurship has lacked a clear conceptual framework and agreed boundary conditions. Consequently, the field remains, to a significant degree, a broad collection of disparate theoretical approaches and associated definitions. For example, Davidsson (2005) identifies at least seven distinct definitions of "entrepreneurship." It can be seen as the study of new market entry (Lumpkin & Dess, 1996), the creation of new enterprise (Low & MacMillan, 1988), or the emergence of new firms in relation to market dynamics (Baumol, 1993). Alternatively, it can be viewed in terms of the psycho-social aspects of individual entrepreneurs who identify and seek to exploit new opportunities (Baron, 2004a; Mitchell et al., 2004).

Overall, therefore, some claim that the field of entrepreneurship is still emergent (Busenitz et al., 2003) and navigating an ongoing adolescent search for identity (Low, 2001). Going further, some question whether entrepreneurship can or should be regarded as a separate field of enquiry in its own right. Without consistent and agreed definitions,

boundaries and processes, some researchers question the distinctive identity of entrepreneurship within the broader domain of business studies. Such detractors regard it as a collection of theories and projects from other fields, including strategic management and organizational behavior (Vecchio, 2003).

However, this critique assumes that the integrity of any field of study rests on its conceptual and theoretical distinctiveness. It assumes that any field worthy of the name must include unique constructs, unifying theories and clear boundary conditions (e.g., Bacharach, 1989b; Singh, 2001). Others take an alternative view and argue that the field of entrepreneurship can be defined in terms of its important research questions and particular phenomena (Davidsson et al., 2001; Gartner, 2001; Ireland, Reutzel, & Webb, 2005). This perspective implies that fields within business studies do not require theoretical integration and unification, and can be based upon shared research goals and theoretical plurality. From this perspective, the theoretical borrowings found in entrepreneurship are not problematic, but rather inevitable aspects of research in a complex, dynamic research domain. Indeed, it may be that the apparent coherence of other fields of management research relies on assumed boundary conditions that will become increasingly porous and unsustainable over time.

Debates about the integrity and coherence of entrepreneurship as a field may find some degree of resolution as scholars develop more process-oriented models and theoretical frameworks about the emergent phenomena associated with entrepreneurship. That is, coherence may emerge in the form of a process view which serves to link theories borrowed from other fields. Such borrowings may help to explain the different phases and sub-processes of entrepreneurship which are collectively synthesized in terms of emergent phenomena. This approach may not deliver a theory in terms of a tightly integrated, causal predictive model. However, it may draw together the related phases and levels of the

entrepreneurial process. Indeed, the search for process models is the stated goal of a number of leading researchers in the field (Davidsson et al., 2001; Sarasvathy, 2001; Shane, 2003; Shaver & Scott, 1991). This thesis is also conceived in that spirit, in that it seeks to explore one important sub-process of entrepreneurship.

### **The Purpose of Entrepreneurship**

The debate about the integrity of entrepreneurship as a distinct field is mirrored in debates about its purpose (Low & MacMillan, 1988). On the one hand, some view the primary purpose of entrepreneurship as the generation of practical and theoretical knowledge that supports the creation of new firms and innovation (Baron, 1998). This approach is more inclined to a pluralistic definition of the field. On the other hand, some view its primary purpose as the quest for integrated, explanatory theories about the role of new enterprises in societal development (Zahra & Dess, 2001). In either case, however, most scholars agree that entrepreneurship research must become more theoretically coherent and especially its borrowing from other fields and disciplines (Busenitz et al., 2003; Davidsson & Wiklund, 2001a; Low, 2001).

Low (2001) also highlights pedagogical outcomes as another major purpose for research into entrepreneurship conceived as new enterprise creation. However, there is a related debate about the degree to which entrepreneurship can be taught, and if so, how (Béchar & Grégoire, 2005). On the one hand, if one accepts that key attributes of entrepreneurs are based on personality traits (e.g., Stewart, Watson, Carland, & Carland, 1999), then education and training are unlikely to have a fundamental impact because they rarely alter a person's underlying personality. On the other hand, if one accepts that entrepreneurial cognition and skills can be learnt and acquired through experience (e.g., Neck, Neck, Manz, & Godwin, 1999), then education and training may have a significant impact on decision making and other key capabilities required for entrepreneurship.

However, even though it is broadly agreed that aspects of self-regulation play important roles in educational outcomes (Boekaerts, Maes, & Karoly, 2005), few scholars have investigated the role of those aspects of self-regulation in entrepreneurial education and training (Bécharde & Grégoire, 2005). Furthermore, even those who believe that entrepreneurial education and training are effective argue about the degree to which such intervention must be practical and experience-based, as opposed to formal classroom instruction (Markman et al., 2002). This debate also relates to the question of who should be regarded as an entrepreneur, because the conception of who is an entrepreneur will significantly influence the style and content of entrepreneurial education and training.

### **Definitions of Entrepreneur**

As noted earlier, the ongoing debate about the nature of entrepreneurship as a field is reflected in the range of perspectives on who should be regarded as an entrepreneur. Some researchers focus on the individual as the founder of new ventures and tend to borrow theories from other disciplines such as psychology and sociology (Bruyat & Julien, 2001; Zahra & Dess, 2001). Others focus on the individual's role in the recognition of new opportunities and the creation of new ventures to exploit them (Shane & Venkataraman, 2000b). Some of these scholars argue that entrepreneurs differ dramatically from managers and small business owners in terms of the motivations and orientations. They claim that small business owners are less risk oriented, less innovative and possess less achievement motivation compared to entrepreneurs (Stewart et al., 1999). Seeking to explain these characteristic behaviors, some researchers look to cognitive psychology. They propose that many of the distinctive attributes of entrepreneurs can be explained in terms of "entrepreneurial cognition," which they define to include mental models, heuristics, intuitions and self-regulatory characteristics (Baron, 2004a; Busenitz & Barney, 1997; Mitchell et al., 2004).

On the other hand, some scholars focus more on the dynamics of new markets and innovation, related environmental and economic factors, and the resources required to create new ventures in those situations (Alvarez & Busenitz, 2001; Thornton, 1999). From that perspective, an entrepreneur is a person who plays a significant role in those processes, whether as a founder or an employee. These definitions focus less on the distinguishing psycho-social characteristics of individual persons and more on the environmental and organizational factors surrounding the exploitation of opportunities. Nor surprisingly, these scholars tend to borrow from disciplines such as economics (Alvarez & Busenitz, 2001). Some argue that this lack of consensus about who is an entrepreneur continues to hamper research into entrepreneurial behavior and decision making (Shane et al., 2003).

In this study, the emphasis is on the social cognitive attributes of entrepreneurs as individual decision makers, rather than wider organizational or contextual factors in entrepreneurship. In that respect, this thesis chooses to focus on the person rather than the firm (cf. Davidsson, Forthcoming). Therefore, this thesis will adopt a psycho-social approach and define an entrepreneur as someone who has been directly involved in founding and managing a new venture to exploit a growth opportunity. This is the same definition employed in other studies of entrepreneurial cognition and decision making (Brockhaus, 1980; e.g., Forbes, 2005a; Shaver et al., 2001). It should be noted, however, that this definition is not intended to deny the significance of organizational and other socio-economic variables in the explanation of entrepreneurial decision making. Rather, it focuses the thesis in terms of its exploratory goals.

### **The Classical Approach**

Early approaches to entrepreneurship stressed its positive function in industrialization and economic development. Max Weber's (1930) pioneering work on Protestantism helped to establish the theoretical framework for this view of

entrepreneurship. He examined the change in attitude towards entrepreneurship that took place after the Reformation in Western Europe from being one of opposition to the pursuit of economic wealth and development to one of acceptance and active promotion. He analyzed the way in which Protestant religion helped to develop a positive attitude towards moneymaking and work (Swedberg, 2000).

Subsequently, Schumpeter (1934) stressed the entrepreneur's central role in economic development as the ability to disrupt the economic status quo through innovation and informational discontinuity. He claimed to identify the main types of entrepreneurial behaviors: introducing a new good; introducing a new method of production; opening a new market; conquering a new source of raw materials; and reorganizing an industry in a new way (Swedberg, 2000). He also stressed the nature of entrepreneurial motivation derived from the joy and satisfaction that comes from creation, problem solving and competitive success. He highlighted certain psychological characteristics of entrepreneurship, such as the readiness to take social and economic risks and the willingness to deviate from habitual ways of thinking and seek new alternatives (Goss, 2005).

Other scholars of entrepreneurship continued the streams of thought initiated by Weber and Schumpeter, linking cultural and market dynamics to psychological factors such as achievement motivation (Johnson, 1990; McClelland, 1961). In the tradition of Austrian economics, Kirzner (1998) portrays the entrepreneur essentially as a person who seeks to identify and exploit profit opportunities that may already exist in dynamic markets, thereby helping to restore market equilibrium. His view of the "entrepreneur as someone who restores equilibrium is often contrasted to that of Schumpeter, who sees the entrepreneur as someone who breaks an equilibrium through an innovation" (Swedberg, 2000). More recently, Sarasvathy (2001; 2004a) has proposed an alternative to these

classically causal views of entrepreneurial behavior. She focuses instead on processes of entrepreneurial imagination, intention and bringing about, or as she defines it, processes of “effectuation.”

This debate around the role of individual entrepreneurs in the socio-economic processes of entrepreneurship has a deeper ontological dimension as well. On the one hand, some scholars argue that opportunities exist objectively within markets independently of entrepreneurs, and that the role of the individual is to recognize such opportunities (e.g., Shane, 2003). On the other hand, another group of scholars argues that opportunities may not exist prior to their being created or imagined by entrepreneurs (Davidsson, 2005; Sarasvathy, 2001). In the context of this thesis, I assume that both scenarios may occur, and that neither necessarily excludes the other.

The important point to note is that Weber, Schumpeter, Kirzner and Sarasvathy all stress the role of the individual entrepreneur as a person with special characteristics who performs a critical function in the exploitation of opportunities in dynamic socio-economic environments. They also recognize that entrepreneurs often play a central role in the emergence of new firms and marshalling the resources that new firms require.

### **Theories of the Firm**

Different theories of the firm have informed numerous recent studies of entrepreneurship. Scholars have explored the resources, networks and environmental factors that are required for the creation and emergence of new firms (Dew, Velamuri, & Venkataraman, 2004; Garnsey, 2001; Greve & Salaff, 2003). Historically, however, the theory of the firm has not focused on entrepreneurship. That is because most theories of the firm are concerned with the choice variables that determine mature organizational functioning and performance (Baumol, 1993). From this perspective, management decision

making is described in terms of resource allocation and profit-maximizing and these values implicitly assume that the firm is relatively mature and already producing and marketing goods and services. That is not the case in the initial phases of entrepreneurial venture emergence, which is why the classical theory of the firm has tended to ignore entrepreneurship.

Notwithstanding this limitation, some scholars have applied resource-based theories of the firm to the study of entrepreneurship. They regard resource acquisition and allocation as the primary functions of firms including new ventures (Garnsey, 2001). For example, Alvarez and Barney (2004) recently proposed a theory of the entrepreneurial firm grounded in organizational economics, bounded by rent generation and the appropriation of resources including entrepreneurial knowledge. In another recent study, Alvarez and Busentiz (2001) extended the compass of resources to include entrepreneurial cognition and related skills. This reflects the call by Baumol (1993) and others for scholars of entrepreneurship to incorporate concepts and theories from other disciplines such as social psychology, sociology and cultural studies into theories of new firm creation. Indeed, that recommendation has already been widely adopted and partly explains the many recent contributions to entrepreneurship research made by scholars borrowing from disciplines such as sociology and psychology (cf. Busenitz et al., 2003; Davidsson & Wiklund, 2001a).

### **Sociological Approach**

Until recently, sociological research in entrepreneurship followed the path set by Weber (1930) and focused primarily on the supply-side, that is, on the individual social traits of entrepreneurs. Newer work from the demand-side perspective also focuses on social networks and patterns of opportunity emergence, thereby illuminating the social



contexts in which entrepreneurship occurs (Thornton, 1999). Thus, more recent research on entrepreneurship from a sociological and ecological perspective focuses on issues such as resource availability, social capital and entrepreneurial networks (e.g., Aldrich & Martinez, 2001; Schoonhoven & Romanelli, 2001). Scholars explore the role played by social relations in establishing a firm and how entrepreneurs use their social capital to access resources and identify opportunities (e.g., Davidsson & Honig, 2003). Entrepreneurship is thus viewed as a socially embedded process and not simply in terms of individual personality or psychology (Eisenhardt & Compans, 2002; Greve & Salaff, 2003).

### **Psychological Approach**

The psychological approach to entrepreneurship also has a long history. It follows Schumpeter's (1934) early insights regarding the individual as the key variable in entrepreneurship. Initially, many scholars looked to personality psychology for answers. For example, some argued that the need for achievement predisposes a person towards entrepreneurial positions (Johnson, 1990; McClelland, 1961). Other scholars claimed that entrepreneurs were also distinguished by psychological traits such as locus of control and risk propensity. However, these claims were not supported by the majority of empirical studies and the personality trait approach has fallen out of favour with many scholars (Low & MacMillan, 1988; Mitchell et al., 2002; Shaver & Scott, 1991).

However, this lack of progress in personality-based research may be partly due to the theories and methods used to identify those characteristics. Furthermore, definitional confusions also persists regarding who should be regarded as an entrepreneur (Stewart et al., 1999). As a result, some recent scholars have advocated re-visiting the personality trait approach to entrepreneurship, but using more sophisticated models and methods. For example, a study by Korunka et al (2003) shows that investigating the isolated effects of the personality characteristics of nascent entrepreneurs and new business owners turns out

to be inappropriate and simplistic. Instead of searching for the direct effects of personality on new small businesses, their study shows that it would be more rewarding to explore the common action patterns underlying the different nascent entrepreneur configurations. In that regard, recent scholarship points towards a pluralistic approach to the characteristics of individuals as entrepreneurs, that is, an approach that seeks to incorporate personality traits without assuming the existence of a specific and ubiquitous personality type (e.g., Baum et al., 2001; Frese et al., 2002; Vecchio, 2003).

### **Cognitive Approach**

Despite the renewed interest in personality traits, many scholars have largely rejected this approach to entrepreneurship. Instead, recent scholarship has witnessed an increasing interest in social cognition and some scholars have argued that entrepreneurs are significantly distinguished by their cognitive attributes (Mitchell et al., 2002). As noted earlier, a number of scholars explore the role of a distinctive entrepreneurial cognition (Baron, 2004a; Busenitz & Barney, 1997). For example, Busenitz (1999) highlights the important role of cognitive bias and heuristics as mediators of risk in entrepreneurial decision making. Also using a cognitive perspective, Palich and Bagby (1995) showed that entrepreneurs did not display stronger risk propensity compared to other managers, however they tended to categorize risky business scenarios more positively than non-entrepreneurs.

Other studies have located entrepreneurship within a social cognitive framework by exploring the role of self-efficacy, which is the belief in one's own ability to be efficacious in specific task domains (Bandura, 1997; Boyd & Vozikis, 1994; Chen et al., 1998; Markman et al., 2002; Shepherd & Krueger, 2002). In the same vein, Schoonhoven and Romanelli (2001) identify the critical role played by shared mental constructs or models acquired by entrepreneurs through organizational communities. Such communities provide

access to relevant resources and cognitive frameworks. They also endorse entrepreneurial career choice and risk taking, encourage opportunity recognition and exploitation and provide potential role models and mentors. At the same time, such communities often include supportive organisations such as venture capitalists, research institutions and incubators, within an integrated social ecology of entrepreneurial cognition (Aldrich & Martinez, 2001; Schoonhoven & Romanelli, 2001). These studies build upon theories borrowed from social cognitive psychology and related disciplines.

Furthermore, cognitive studies of entrepreneurship are typically placed in a multidimensional framework and few scholars expect cognitive factors alone to uniquely identify entrepreneurs or to resolve questions about the nature of the field as a whole. Rather, they see entrepreneurial cognition as a critical component of a wider, more multidisciplinary approach to the subject (Busenitz et al., 2003; McMullen & Shepherd, 2006; Mitchell et al., 2004). At the same time, they call for a pluralistic infusion of theories and methods from related disciplines. These would assist in developing a deeper understanding of how entrepreneurs use knowledge networks and other cognitive resources. This could lead to a more sophisticated taxonomy of the environmental forces – such as population, community and society – and the types of situational contingency that influence entrepreneurial cognition and decision making (Aldrich & Martinez, 2001). These factors help to determine key entrepreneurial decisions relating to career choice, opportunity identification and opportunity exploitation. Furthermore, insofar as these factors all share a social dimension, they are relevant to the framing of self-regulation in decision making by entrepreneurs.

### **Values and Ethics in Entrepreneurship**

Another dimension of decision making by entrepreneur is that of values and the related area of ethics. Values are typically defined as the core beliefs and principles that are

held to be important and desirable by some society, community, group, or by individual persons. Ethics, on the other hand, are usually defined as the conception or standards of right, good or acceptable conduct or behavior (Joyner, Payne, & Raiborn, 2002). For any given group or individual person, ethics are often based on values.

In the entrepreneurship literature, values and ethics are dealt with on multiple levels: social, economic, organizational and personal values and ethics. Regarding social values and ethics, scholars have researched the apparent dilemma of social benefits derived from entrepreneurial activity on the one hand, and the perception that many entrepreneurs are self-seeking and disinterested in the social good on the other (Brenkert, 2002; Bucar, Glas, & Hisrich, 2003). High profile scandals involving unethical behavior by entrepreneurs have fuelled this dilemma. Yet some scholars argue that the fundamental values of the social good and ethical behavior are not antithetical to entrepreneurship but deeply compatible with the overall goal of creating social value (Velamuri, 2002).

A similar debate occurs around economic value. Once again, researchers debate whether entrepreneurs are primarily motivated by selfish financial ambitions and sacrifice ethical standards in pursuit of such values, or are they typically committed to serving stakeholder rights and interests across the board (Venkataraman, 2002). From a classical perspective, entrepreneurs are expected to seek profit maximization first and foremost, and the concern for economic justice comes a distant second (Machan, 1999). Adopting a more behavioral perspective, however, theories allow for the influence of cultural and relational factors in the pursuit of economic value (Sarasvathy, 2002). The influence of these factors is exemplified by entrepreneurship in the social and not-for-profit sectors.

Similar concerns dominate the literature regarding values and ethics in entrepreneurial firms. Research shows that many new ventures have strong cultural values around work practices, equity sharing and ethical business behavior (Longenecker,

McKinney, & Moore, 1989b). However, at the same time, new ventures can also be highly unregulated, mismanage employee relations and be victim to founder tyranny (Baron, Hannan, & Burton, 1999). Either way, organizational values and ethics play a significant role in the shaping and management of young firms and the standards they employ in decision making.

Values and ethics in entrepreneurship also depend heavily on the founder's personal values and ethics (Teal & Carroll, 1999). Indeed, the literature suggests that founders have a major influence on the values and ethics adopted within new ventures (Morris, Schindehutte, Walton, & Allen, 2002). This can sometimes create tension and conflict, especially as young companies start to grow and require more systematic decision making processes and acquire other stakeholders. The founder's personal values and ethics may need to adapt. His or her stronger purpose and strict morals may need to bend in order to accommodate the interests of groups with lesser standards. Alternatively, founders whose decisions are driven by personal gain and success to the exclusion of other values may need to accept the constraints demanded by regulatory and governance regimes (Bucar & Hisrich, 2001). The effort to adapt decision making in that way will require a self-regulatory response, thus linking the literature on entrepreneurship to that on self-regulation.

## **SELF-REGULATION**

As noted earlier, self-regulation is an important feature of social cognition. The study of social cognition is distinguished from non-social cognition by its focus on the interaction between social and cognitive variables. It seeks to study how people think about the social world and how that world influences the way people think. Social cognition

underlies learning about what matters in the social world and thereby provides essential aspects of what it means to be human (Higgins, 2000b).

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, 2000). There is also a general consensus that self-regulation “involves cognitive, affective, motivational and behavioral components that provide the individual with the capacity to adjust his or her actions to achieve desired results in the light of changing environmental conditions” (Zeidner et al., 2000: 751). A group of leading scholars in the field define it thus: “Self-regulation can be defined as a multi-component, multi-level, iterative, self-steering process that targets one’s own cognitions, affects and actions, as well as features of the environment for modulation in the service of one’s goals” (Boekaerts et al., 2005:150).

Furthermore, in a world where organizational boundaries and networks are becoming more dynamic and societal, social cognition is increasingly relevant for management studies (Brotherton, 1999). This is one reason why the study of self-regulation has blossomed in recent years. Interest in these topics has also been driven by widespread practical changes in organizational behavior, where individual initiative, teamwork and leadership have prompted greater attention to self-regulatory mechanisms (Kanfer, 2005).

The growing interest in self-regulation also reflects the fact that many psychologists have rejected narrow behaviorist and functionalist approaches to the explanation of human thought and behavior, just as many scholars of entrepreneurship have rejected the personality trait approach. Following the multi-disciplinary cognitive revolution in the second half of the twentieth century (see Bruner, Goodnow, & Austin, 1956; Chomsky, 1957; Chomsky, 2000; Edelman, 1992), most scholars of human

cognition and behavior now explore the multidimensional nature of human consciousness and intentional agency and their expression in self-regulatory processes (Bandura, 2001).

Self-regulation therefore plays an important role in social thought and behavior. It influences the nature and value of one's projected outcomes, the motivation systems underpinning decision making (Higgins, 2000a) and appears to be related to both cognitive and decision styles (Thunholm, 2004). Moreover, self-regulation can be either conscious and intentional or automatic and unintentional (Zeidner et al., 2000). Although, as Wegner (2003) has recently claimed, it may be that so-called conscious will and intentionality always include significant unconscious and external components and that peoples' ordinary intuitions of autonomous will and self-control are simply approximations to more complex psycho-social realities. From that perspective, a substantial amount of self-regulation may be unconscious.

Not surprisingly, research into self-regulation is also closely related to the study of rationality and consciousness in cognition. In recent years, for example, scholars have explored the limits of systematic cognitive processing and sought to understand the conditions under which bounded rationality is consciously deliberate or unconsciously automatic and what role self-regulation might play in such deliberate and automatic action (Kahneman, 2000; Schwartz, 2002). This has led to substantial research on the perceived (as opposed to actual) outcome value in decision making and on the role of intuition and heuristics in such cognitive processes (Boekaerts, Pintrich, & Zeidner, 2000; Gilovich & Griffin, 2002). These questions have also become major topics in the study of entrepreneurial cognition (Baron, 2004b; Busenitz, 1999).

### **Theoretical Approaches**

Most scholars broadly agreed that self-regulation involves cognitive, affective, motivational and behavioral components and provides individuals with the capacity to

adjust their actions to achieve desired results in the light of changing internal and external conditions (Zeidner et al., 2000). They also agree on the centrality of the goal construct. Yet owing to its relative novelty, the study of self-regulation still lacks broad theoretical consensus. In fact, there is a range of alternative approaches to self-regulatory mechanisms in behavioral and cognitive psychology and contentious debates still continue (Karoly, 1993).

The literature on self-regulation includes a number of theoretical schools of thought. They include control theory (Carver & Scheier, 1990), goal setting theory (Latham & Locke, 1991), self-discrepancy theories incorporating regulatory focus theory (Higgins, 1998a) and social cognitive theories (Bandura, 1997). Each school has its strengths, but they are not always theoretically compatible (Karoly et al., 2005; Vancouver, 2000). However, it is not the purpose of this thesis to adjudicate between the different approaches to self-regulation. Instead, this thesis focuses on a number of frameworks and constructs that have already been studied in relation to entrepreneurship and the processes associated with management decision making. The rationale is to build on previous studies in the field as a way to bring greater theoretical coherence to this area of research (cf. Bacharach, 1989a). The following sections will simply provide an overview of the theoretical literature regarding self-regulation.

### **Control Theory**

Control theory assumes that human behavior is a continual process of moving toward and away from, various kinds of mental goal representations (Carver & Scheier, 1998). This is achieved by a process of feedback control. From this perspective, behavior is seen as the consequence of an internal guidance system inherent in the way living beings are organized. The guidance system regulates a quality of experience that's important to it. For that reason, the guidance process is viewed as a system of self-regulation. However,



this top-down model of self-regulation is contested. Others argue that goal-directed behavior can be bottom-up, in the sense that is not deliberate, but rather unconscious and automatic (Karoly, 1993). From this perspective, self-regulation is not subject to ongoing feedback control, even though feedback processes may still occur.

### **Goal setting Theory**

Goal setting theory is an alternative approach to self-regulation. The founders of this approach, Latham and Locke (1991), explicitly reject control theory. They focus their research on work motivation in organizational settings. They seek to explain the self-regulatory effects of goal setting and the ways in which people can use goals as a self-management technique. Key factors in this process are commitment, feedback, task complexity, ability and situational constraints. From this perspective, personal, social and environmental factors operate in concert to affect an individual's goals and self-regulatory activities. The effects of these factors are typically studied in terms of their effects on four related processes: goal establishment, goal planning, goal striving and goal revision (Kanfer, 2005). Latham and Locke also argue that these skills can be learnt and taught and thus improved.

In response, Carver and Scheier (1998) suggest that Latham and Locke's primary objection to control theory is that feedback models are mechanistic, even though goal setting theory itself also relies heavily on the feedback model. In fact, this controversy over the similarity or difference between goal setting and control theories has continued for a number of years as alternative formulations of work motivation (Kanfer, 2005). The earlier debates focused on challenges to goal approaches focused on behavioral explanations. More recently, researchers have focused on potential differences with cybernetic control formulations and their ability to explain discrepancy production – "that is, the extent to

which each model can account for upward revision of goals following goal accomplishment” (Kanfer, 2005: 187).

### **Regulatory Focus Theory**

A third approach to self-regulation is Higgins (1998a) regulatory focus theory, which is a form of self-discrepancy theory. Such theories explain self-regulation in terms of a person’s attempt to reduce or create discrepancies between desired and ideal end-states. Regulatory focus theory, in particular, describes how people engage in self-regulation with either a promotion focus or a prevention focus. 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. 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 (Higgins, 1998a).

This theory is particularly relevant to the study of entrepreneurship because scholars often describe entrepreneurs as people who are primarily focused on attaining gains and less focused on avoiding losses (Baron, 2003; Brockner et al., 2004; e.g., Mintzberg et al., 1998). Consistent with this, Higgins and Brockner (2001; 2004) have proposed that entrepreneurs have a dominant promotion focus. As Brockner and Higgins (2001: 60) explain:

“the values and norms in an entrepreneurial start-up company are apt to elicit in employees a promotion focus, as they engage in the process of trying to help the company reach its goals. Such companies often reflect the vision, dreams and ideals of their founders. To the extent that (attempting to realize) the idealistic vision of the founder has become part of the company’s culture, organization members are likely to adopt a promotion focus.”

If that is true, then regulatory focus theory may help to explain how and why some entrepreneurs adopt strong promotion orientations towards potential gains in opportunity identification, yet weaker prevention orientations towards potential losses in risk analysis (Brockner et al., 2003). Indeed, other studies have shown that promotion focus is associated with risk taking behavior, decision speed, planning fallacy and other cognitive states that are typical of entrepreneurs (Brockner et al., 2003; Förster et al., 2003; Higgins, 2002). Not surprisingly, other scholars have noted the relevance of regulatory focus for entrepreneurship, given that entrepreneurs are typically achievement oriented (Baron, 2004a).

Higgins (2002) has also shown that people in a promotion focus will value attainment decisions more highly than avoidance decisions, and this could help to explain why entrepreneurs often place greater importance on decisions about growth opportunities and less importance on decision making about potential downsides, at least in the start-up stage (Bhide, 2000). It has also been argued that successful entrepreneurs adapt or combine promotion focus and prevention focus, in a self-regulated fashion, depending on the specific task situation and environmental conditions (Brockner et al., 2003).

In some situations, that is, entrepreneurs require a promotion focus to pursue goals and persist in the face of uncertainty and setbacks. While in other situations, they will require a prevention focus or some combination of the two. Thus, the regulatory focus will depend on the situation - whether the primary motivation is promotional (to advance and create), or preventative (to protect and avoid), or a combination of both. For example, pitching to potential investors combines both goal advancement with protecting future interests and thus requires a combination of promotion focus and prevention focus. In that sense, regulatory focus is also adaptive in response to situational contingency.

Regulatory focus is also a chronic disposition. Its chronic form is captured by regulatory pride, which is composed of two constructs, promotion pride and prevention pride (Higgins et al., 2001). These two constructs relate to a person's subjective history of success in relation to positive goal attainment or loss avoidance. 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." Therefore both promotion pride and prevention pride involve motivations to approach or attain new task goals, and entrepreneurs are typically defined as people who do just that (Alvarez & Busenitz, 2001; Baron, 2004a; Mitchell et al., 2002; Shane & Venkataraman, 2000a).

Studies have shown that promotion pride is associated with a sense of optimism, life purpose, goal directedness and self-esteem (Grant & Higgins, 2003). In addition, people with stronger promotion pride are less likely to make errors of omission (that is, failing to act), whereas people with stronger prevention pride are less likely to make an error of commission (that is, committing an error) (Higgins et al., 2001). As a consequence, people with dominant promotion pride are also willing to take more risks in order to achieve gains. Higher promotion pride is also positively related to the number of means employed per goal, whereas stronger prevention pride is negatively related to the number of means per goal. Thus, if a person acts from strong promotion pride, the resulting eagerness orientation will incline them to use more goal means that could produce a hit. Whereas if a person acts from strong prevention pride, the resulting vigilance orientation will incline them to use less unnecessary goal means that could produce a mistake.

Promotion pride and prevention pride also differ in their orientations toward how to successfully attain such goals. Promotion pride is oriented toward eagerness (approach) means of success, whereas prevention pride is oriented toward vigilance (avoidance)

means of success. As Higgins et al (2001) note, this difference in strategic regulatory orientation has important implications for decision making and problem solving. When people seek to solve problems and make decisions from a promotion pride orientation, they will use more decision means to ensure a hit and seek to avoid errors of omission. Whereas, if they approach problems and decision tasks from prevention pride, they will be more likely to use fewer means and seek to avoid errors of commission. Regulatory pride is thus important for decision making because it largely determines a person's strategic orientation for new task goals and related decision means. Table 1 presents a summary of the preceding review of the psycho-social characteristics that have been associated with stronger promotion pride as chronic promotion focus.

**TABLE 1**

**Characteristics Associated with Stronger Promotion Pride**

<b>Literature Source</b>	<b>Characteristics</b>
(Higgins et al., 2001)	<ul style="list-style-type: none"> <li>• New tasks approached as positive goals</li> <li>• Greater use of eagerness means</li> <li>• Seek to avoid errors of omission</li> <li>• Use more decision means in goal pursuit</li> <li>• Greater risk taking</li> </ul>
(Grant & Higgins, 2003)	<ul style="list-style-type: none"> <li>• Stronger sense of optimism</li> <li>• A sense of purpose</li> <li>• Stronger goal directedness</li> <li>• Higher self-esteem</li> </ul>

Given that the critical decisions made by entrepreneurs are about tackling new task goals, then regulatory pride may be important for identifying the task goal orientation of entrepreneurs and what decision means they adopt in relation to those goals. In particular,

entrepreneurial opportunity recognition and exploitation are almost, by definition, promotion oriented goals and a history of success in achieving such goals may engender a strong promotion pride (Brockner et al., 2004; Higgins et al., 2001). The potential relevance of regulatory pride is further strengthened by the fact that it relates to a person's subjective history of previous goal success, and that has also been identified as an important factor in entrepreneurship (Bruyat & Julien, 2001; Greve & Salaff, 2003). For these reasons, this thesis will focus on the role of regulatory pride in decision making by entrepreneurs.

### **Social Cognitive Theory**

Another major theory of self-regulation is Albert Bandura's (1997) social cognitive theory. This theory claims that human beings possess self-reflective and self-reactive capabilities that enable some control over their thoughts, feelings, motivation and actions. Its central construct is self-efficacy which refers to the belief in one's ability to be efficacious in specific task domains. Self-efficacy also relates to other aspects of self-regulation, such as self-confidence, task commitment, motivational strength and creativity. It is especially important for advanced cognitive functioning, such as managing complexity and uncertainty, where agents require greater confidence and commitment to perform more sophisticated cognitive tasks. Strong self-efficacy is also associated with greater information search behavior, strategic decision making, goal directness and stronger cognitive load capacity (Wood, Bandura, & Bailey, 1990; Wood et al., 2000). However, in contrast to regulatory pride, self-efficacy is not in itself about one's 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).

Nonetheless, social cognitive theory incorporates a large set of self-regulatory mechanisms into the conception of self-regulation (Bandura, 1991). The result is a rich

concept of self-regulation that is well suited to the explanation of patterns of thought and action in complex dynamic environments, where strong self-efficacy is often required for agents to persist in the face of obstacles and uncertainty. An emergent socio-cognitive concept of the self is critical to this approach, because it helps to overcome the classical ontological and epistemological dilemmas regarding conscious intentionality and autonomy on the one hand, versus unconscious determinism and dependence on the other (Bandura, 2001). Thus, social cognitive theory rejects the necessity of those dilemmas and adopts an emergent, pluralistic concept of selfhood instead.

This thesis will focus on the particular form of self-efficacy known as entrepreneurial self-efficacy, that is, the belief in one's efficacy in relation to the entrepreneurial task domain. This form of the construct has already received significant attention in the entrepreneurship literature and especially in relation to career choice (e.g., Anderen, Reznik, & Chen, 1997; Chen et al., 1998; Scherer et al., 1989). The construct is also relevant for entrepreneurial task commitment, as Bandura (1997:455) explains:

"Entrepreneurship, which is driven by the envisioned opportunities of new ventures, rests heavily on a robust sense of efficacy to sustain one through the stresses and discouragements inherent in innovative pursuits. Strong belief that one can produce results lowers the perceived odds against success."

Other scholars have explored entrepreneurial self-efficacy in terms of dynamic situational contexts. They argue against seeking to identify stable personality and situational characteristics that influence entrepreneurial thought and behavior, and advocate instead a more dynamic socio-cognitive approach including self-efficacy (e.g., Markman et al., 2002; Shepherd & Krueger, 2002). Table 2 presents a summary of the preceding review of the psycho-social characteristics that have been associated with stronger self-efficacy.

**TABLE 2**  
**Characteristics Associated with Stronger Self-Efficacy**

<b>Literature Source</b>	<b>Characteristics</b>
(Bandura, 1997)	<ul style="list-style-type: none"> <li>• Stronger self-confidence</li> <li>• Higher task commitment and motivational strength</li> <li>• Higher metacognitive capability</li> <li>• Greater creativity</li> </ul>
(Wood et al., 1990; Wood et al., 2000)	<ul style="list-style-type: none"> <li>• More information search in decision making</li> <li>• More strategic decision making</li> <li>• Higher cognitive load bearing capacity</li> </ul>

### **Values and Self-Regulation**

Among other important features of self-regulation in decision making are values and ethics. Through the use of self-regulatory mechanisms, people reflect their value systems in goal setting and goal pursuit. By expressing the nature of desired ends, values underpin the goals people set at the social, economic, organizational and personal levels. In the same fashion, ethical standards influence the nature of self-regulated goal pursuit. That is, people will tend to self-regulate their thought and behavior in accordance with personal and/or communal ethical standards (Carver & Scheier, 1998; Higgins, 2000b).

Furthermore, not only do values and ethics guide self-regulation in decision making. The reverse process also holds, as self-regulated decision making partly determines a person's values and ethics. Research has shown that the way in which a person self-regulates their decision making and means of goal pursuit will influence their value judgments and ethical standards. In particular, Higgins et al (2003) have shown that "value from fit" flows when a person's decision means suit their regulatory orientation towards the desired outcome. For example, if the goal is to exploit a new market opportunity, then the use of eagerness means in decision making will generate a sense of



value and of having made the right decision. That is because the pursuit of a new opportunity is typically oriented towards achieving positive gains, and eagerness means are the appropriate way to pursue such goals. Value can also flow from using proper means, that is, from using decision means that are in accord with established standards in an organizational or social context.

In addition, self-regulation plays an important role in assessing the relative value and rightness of risky decisions. If a person acts from a promotion pride, for example, then he or she will regard gains as higher in value than non-losses. Whereas a person who acts from prevention pride will regard losses as lower in value than non-gains (Higgins et al., 2001). Consequently, perceptions of what constitutes fair and justified decision making will reflect value judgments. When acting from promotion pride, a decision will be regarded as more fair and right when it errs towards attaining gains, rather than avoiding losses. The opposite will apply when acting from prevention pride, when the trade-offs will tend to be reversed. A decision will then be regarded as more fair and right when it errs towards avoiding losses, rather than attaining gains (cf., Cesario, Grant, & Higgins, 2004; Grant & Higgins, 2003). These distinctions could be expected in decision making by entrepreneurs and may be a source of conflict between competing outcome values and ethical judgments.

### **Recent Studies of Self-Regulation and Entrepreneurs**

As noted earlier, two recent PhD theses have investigated regulatory focus in relation to entrepreneurship. In the first of these, Hmieleski (2005) investigated a suite of cognitive factors including chronic regulatory focus and entrepreneurial self-efficacy. This was done to arrive at a measure of person-entrepreneur fit, that is, a putative measure of an individual's suitability for key entrepreneurial tasks. Having computed this value, Hmieleski then used quantitative techniques to analyze the relationships between person-

entrepreneur fit and dimensions of firm performance. Importantly for this thesis, he found significant correlations between chronic promotion focus and entrepreneurial self-efficacy ( $r = 0.54, p < .01$ ). As I will later report in Chapter 4, this result is similar to that found in this thesis using nonparametric Spearman correlations. However, Hmieleski did not use qualitative methods to explore these related construct variables fit in relation to the decision making behaviors of individual entrepreneurs.

In another recent and substantial PhD thesis, McMullen (2003) tested a series of hypotheses relating to the role of regulatory focus in relation to entrepreneurial decision making and firm propensity for novel action. Indeed, McMullen argued that entrepreneurship is inherently decisional, and that social cognitive factors such as regulatory orientation are central to explaining novel action by entrepreneurial firms. Using a range of experimental and survey techniques, he investigated how both chronic and situational forms of regulatory focus influence entrepreneurial intentions to act. Overall, he reported that promotion focus may be more strongly associated with firm-level intention, although the processes are highly complex and situational. McMullen also found that entrepreneurs tend to possess stronger promotion pride than prevention pride.

However, unlike Hmieleski's thesis and my own, McMullen's thesis did not relate regulatory focus to other self-regulatory factors such as self-efficacy. Nor did he explore how regulatory focus functions across the wider range of decision making scenarios encountered by individual entrepreneurs. It should also be noted that neither McMullen nor Hmieleski used control groups in their studies. By highlighting those limitations, I do not intend any negative criticism of these theses, but rather I wish to distinguish them from my own. Indeed, McMullen's thesis in particular is a substantial contribution and clearly underpinned his recent publication on the topic of entrepreneurial action and uncertainty (see McMullen & Shepherd, 2006).

## Summary

This section reviewed the literature on self-regulation and explained that this thesis will focus on two distinct but closely related self-regulatory constructs: regulatory pride (chronic regulatory focus) (Higgins et al., 2001) and self-efficacy (Bandura, 1997). Together these constructs cover the key attributes of self-regulation in cognition, namely self-reference, motivation systems, goal frameworks, affective attributes such as task confidence and commitment, and related cognitive capabilities. However, while self-efficacy in particular has been studied in relation to entrepreneurship, self-efficacy has not been studied in relation to other aspects of self-regulation at the individual person level. The only study that comes close is Hmieleski's (2005) recent PhD thesis, which investigated the fit between self-efficacy, regulatory focus and typical task demands in entrepreneurial situations such as the need to improvise.

In contrast, this thesis does seek to explore both promotion pride and entrepreneurial self-efficacy at the level of individual decision making. The literature supports this person-level approach. Firstly, both regulatory pride and self-efficacy are partly determined by a person's prior experience of task goal achievement. Success in that regard stimulates regulatory pride as well as a sense of self-efficacy in the relevant task domain (Bandura, 1997; Higgins et al., 2001).

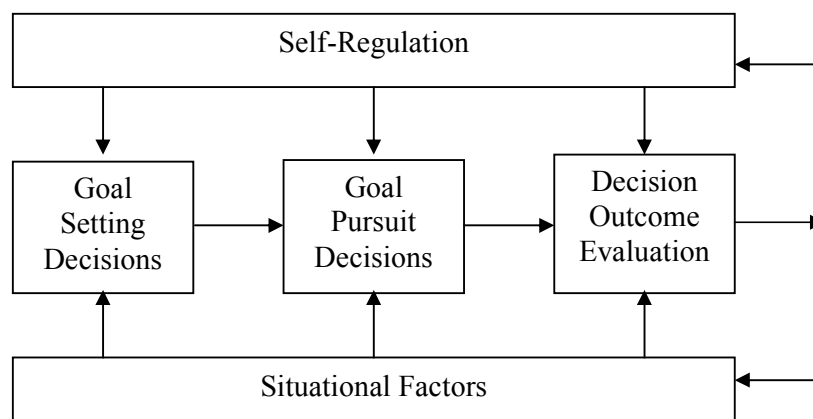
Secondly, both regulatory pride and self-efficacy are strongly related to motivation systems. Regulatory pride captures the overall regulatory framework that underpins a person's approach to new task goals. Some people will be more strongly motivated to achieve positive goal outcomes, that is, to act from promotional pride. While other people will be more strongly motivated to achieve prevention goal outcomes, that is, to act from prevention pride. In that respect, regulatory pride is a more distal attribute based upon achievement history. At the same time, people develop a sense of self-efficacy regarding

both attainment and avoidance tasks. This sense of self-efficacy will partly determine their motivational strength and commitment towards new task goals. In that respect, self-efficacy is a more proximal attribute based upon achievement history. However, as noted above, this apparent linkage between regulatory pride, self-efficacy and achievement history has not been investigated using qualitative or mixed methods.

This section also defined self-regulation in terms of self-directed cognition and behavior related to goal setting, goal pursuit and outcome evaluation. The literature suggests that those phases of goal-directed action are intrinsically linked to processes of decision making in specific task domains such as entrepreneurship. People make decisions about which goals to set for themselves in their chosen task domain, how to pursue them, and then evaluate their success or failure in reaching their goals. These interrelated processes are represented in the model of self-regulation and decision making in Figure 2. This thesis will explore one specific instance of these processes, namely the role of regulatory pride and entrepreneurial self-efficacy in relation to the decision making in entrepreneurial situations.

**FIGURE 2**

**Model of Self-Regulation and Decision Making**



The thesis will thus contribute to the literature on self-regulation by investigating the potential relationship between those constructs in the field of entrepreneurship. The combination of related constructs in this way is recognised as an appropriate way of developing new theory in organizational studies (Bacharach, 1989a; Whetten, 1989). It is also reflects the pluralistic approach to self-regulation that is evident in much of the literature and the search for synthetic theoretical frameworks (Boekaerts et al., 2005).

## **DECISION MAKING**

The decision making literature encompasses issues of great relevance to economics, psychology, jurisprudence, politics, management and other important areas of human affairs. This thesis is narrower and focuses on decision making in socio-economic and organizational contexts. Regarding the socio-economic dimension of decision making, a large body of theory addresses questions such as: are decisions social as well as individual (Sen, 1997); are there normative standards of rationality for *homo economicus* (Thaler, 2000); do decision makers consistently seek to maximize socio-economic utility outcomes (Gigerenzer, 2000); to what degree can we expect general principles of socio-economic decision making to apply across entire populations and markets, or is such decision making inherently situational and contingent (Simon, 1997)? In fact, socio-economic decision making is probably all of these things to some extent and the same may well be true of decision making by entrepreneurs in dynamic socio-economic situations (Sarasvathy, 2002).

Turning to the literature on the organizational aspects of decision making, theories address the following questions: to what extent are decisions based on cultural values, agency interests and personal goals; is strategic choice rule-based, reasoned or purely a matter of chance (Child, 1997); is organizational decision making typified by systematic

processes or by relational conflict and politics (Eisenhardt, Kahwajy, & Bourgeois, 1997); is it an instrumental or interpretive activity; are decision processes primarily attributable to the actions of autonomous actors or to deterministic properties of the organizational environment (March, 1997)? Once again, decision making in organizations is probably all of these things to some degree. The challenge is understand the patterns of variance and interaction across multiple dimensions. There is a range of theoretical perspectives on these questions.

### **The Classical School**

The classical school of decision making research focused on the extent to which people follow normative theories for making optimal choices (Sarasvathy, 2002). This was codified as expected utility theory. It assumed a classical logico-deductive or Bayesian ideal of rationality. That is, it assumed that individuals should be and could be perfectly rational maximizers of utility and value. Economists in this tradition expunged psychology from the study of decision making as vague and unnecessary (Camerer & Loewenstein, 2004). However, as Herbert Simon (1979) famously argued, this was never a realistic perspective and research grounded on these principles consistently fell short in terms of its ability to explain the observed actualities of decision making. Indeed, many now accept his alternative formulation of unbounded rationality and approximate decision making as satisficing, which refers to adopting a course of action that is satisfactory rather than optimizing (Schwartz, 2002).

More recent decision theorists and behavioral economists accept the practical limitations of the classical approach and argue that the belief in strong economic rationality ignores the behavioral and cognitive complexities of actual decision making. They embrace the notion of bounded rationality developed by Simon (2000a). They eschew frameworks assuming static organizational forms, idealised markets and unbounded

rationality and accept the alternative concepts of heuristics and satisficing (Schwartz, 2002; Slovic, Finucane, Peters, & MacGregor, 2002).

Similarly, management scholars commonly argue that decision making is complex and multidimensional and they look to other disciplines such as sociology, cognitive psychology and complexity theory for explanatory concepts and constructs (Volberda & Elfring 2001; Whittington, 1993). Like many behavioral economists, they study the psychological processes that affect human judgment and choice and typically accept the inevitability, normalcy and practical rationality of intuition and heuristics (Camerer, Loewenstein, & Rabin, 2004; Gigerenzer & Selten, 2001). Theories of naturalistic decision making are broadly similar. They focus on how the features of actual decision making situations affect the decision process itself (Hammond, 2000; Payne & Bettman, 2001). This has been paralleled by research into the applied psychology of decision making, showing that individual decision making styles indicates vary significantly based on personal, cultural and situational factors (Thunholm, 2004).

### **Prospect Theory and Heuristics**

Arguably the most important behavioral approach to decision making is the prospect theory developed by Kahneman and Tversky (1979; 2000b). This theory also rejects the traditional assumption of perfectly rational agents. Instead of analyzing decision risk from that classical perspective, it studies the psychological preferences and biases that people adopt in the face of risky prospects. In that sense, prospect theory is a descriptive rather than normative theory. Kahneman and Tversky showed that bounded rational behavior often occurs in dynamic competitive environments where information and time are strictly limited and that heuristics play an important role in those decision making situations. They sought to dispel the fear that the abandonment of classical ideals of

rationality would result in irrational chaos. Their empirical studies showed that human choices are indeed orderly, although not always rational in terms of the Bayesian ideal.

However, other scholars have criticized Kahneman and Tversky for retaining too much of the classical ideal. Gigerenzer (1996), in particular, disputes Kahneman and Tversky's treatment of heuristics. He argues that Kahneman and Tversky still compare heuristics with the classical ideal of unbounded rationality, even while accepting that such an ideal is unattainable and unrealistic. That is, Gigerenzer argues that prospect theory under-values heuristics because they do not approximate the classical ideal of rationality. Gigerenzer (1996), on other hand, embraces heuristics as rational tools of adaptive decision making. He argues that some heuristics – and especially the “Fast and Frugal Heuristics” used in adaptive decision making – are not inherently subject to extreme bias and cognitive error and can be very effective means of decision making, and in that sense, rational.

In a number of empirical studies, Gigerenzer and Goldstein (1996) found that types of Fast and Frugal Heuristic, such as the “Take the Best” heuristic, out-performed systematic analysis in some decision making situations. This heuristic uses the best cue initially and then bases decision upon it. Another Fast and Frugal Heuristic is the "Minimalist" heuristic which bases a decision on the first reason that comes to mind (Gigerenzer, Czerlinksi, & Martignon, 2002). Such Fast and Frugal Heuristics are based upon a number of basic cognitive processes: step-by-step procedures, search limited by simple stopping rules and one-reason decision making. However, the debate between these scholars regarding the nature and status of heuristic decision making remains contentious and occasional heated (e.g., Gigerenzer, 1996). Heuristic decision making also remains a major topic of discussion and debate within the entrepreneurship literature, although gladly on more collegial terms (Busenitz et al., 2003).



## **Cognitive Approaches**

As noted earlier, within the literature on behavioral decision making, there has been a shift towards more social cognitive models, as opposed to models based on ideals of rationality. Thus, scholars now tend towards models of decision making that incorporate limited cognitive capability and social cognitive factors such as self-regulation and environmental conditioning (Hong & Chiu 2001; Morris et al 1998; Wright, 2002; Yzerbyt, Lories & Dardenne 1998). Similar trends are apparent in the literature on decision making by entrepreneurs, where cognitive load, heuristics and organizational climate are highlighted as significant features of entrepreneurial cognition in decision making (Mitchell et al., 2004).

Some argue that these aspects of entrepreneurial behavior and cognition are largely a response to the environment, and therefore that decision making by entrepreneurs is strongly determined and constrained by social and cultural conditions. This school of thought includes the neo-institutionalists, who argue that strategy and organizational development are largely emergent from the environment and not strongly reliant on individual behavior or cognition (Slevin & Covin DiMaggio, 2001; 1995). In contrast, other scholars emphasize that entrepreneurial action inherently implies strong personal intentionality which is largely independent of environmental influences (Bird, 1988; Boyd & Vozikis, 1994).

Brown and Eisenhardt (1997; 1998) seek to combine these approaches, and argue that managers and entrepreneurs are neither autonomous individual decision makers nor agents of sociological processes. They argue that this distinction is simplistic and inadequate as a theoretical framework for decision making within turbulent business environments. Instead, they argue for a pluralistic approach that accommodates a dynamic

diversity of behaviors and decision making styles, without assuming they must be either rigidly analytic and rational or flexibly vague and incremental.

In support of this view, Eisenhardt et al (1997; 1998; 1997) identify synthesizing decision processes such as collective intuition and creative team conflict and try to show how those processes combine both deliberate and emergent styles of cognition and decision making in response to both individual and environmental conditions. Thus they propose organizational, behavioral and cognitive processes of decision making that are less rigid, more responsive to the environment and organizational change, and less constrained by a single theoretical school or paradigm.

### **Decision Making and Environmental Factors**

The management decision making literature includes other proposed syntheses of deliberate and emergent processes, especially in relation to business environments that are characterised by complexity, market turbulence and extended organizational forms. Tushman and O'Reilly (1997), for example, argue that decision makers must accept complexity, uncertainty and contradiction as unavoidable realities. Moreover, by embracing such frameworks, they argue that decision making can be conceived as a highly complex process in which both deliberately rational and intuitive cognitions occur. From that perspective, decision makers are sometimes analytic, rational and deliberate and use reason-based decision making processes. At other times, and for other purposes, they may be intuitive or adopt a rule-based approach to strategic decision making (Aldrich & Baker 2001; Baron, 2003a; Brown & Eisenhardt 1997; Mintzberg, Ahlstrand & Lampel 1998). In that sense, management decision making could be described as a form of self-regulated pluralism in practice.

Such studies contextualize decision making within an increasingly turbulent business environment. That environment exhibits constant change, disruptive new

technologies, high velocity markets, hyper-competitive pressures and dynamic business alliances (Brown & Eisenhardt 1997; Christensen, 2001; D'Aveni, 1999; Senge, Carstedt & Porter 2001; Tushman & O'Reilly 1997). This environment has also been described as information intensive, in the sense that economies are increasingly based on information flows rather than the exchange of material goods (Casson, 1997; Child & McGrath, 2001). These two environmental trends – turbulence coupled with informational intensity – impose significant psychological stress on decision makers. They must be more tolerant of uncertainty and ambiguity, embrace complexity and contradiction and be more cognitively adaptive (Child, 1997; D'Aveni, 1999; DiMaggio, 2001; Galunic & Eisenhardt 2001). That is another reason why some scholars of decision making reject static or closed theoretical models. Environmental realities demand greater theoretical flexibility and openness or in other words pluralism and synthesis, rather than singularism and integration (Eisenhardt, 2000; Volberda & Elfring 2001).

The literature regarding management decision making in highly complex, turbulent environments therefore admits a high degree of behavioral and cognitive flexibility. Decision making styles are thought to switch, depending on environmental factors, such as new disruptive technologies or competitive threats. In other words, the conditioning role of the environment and individual choice preferences are mutual and dynamic (Hammond, 2000; Ireland, Hitt, Camp, & Sexton, 2001). Moreover, as Brown and Eisenhardt (1998) point out, such approaches are radical in terms of their theoretical foundations and associated investigative methodologies. They are radical because they suggest a research paradigm that integrates both cognitivist and behaviorist approaches, causal and functional explanatory models, and the use of case study methods combined with systematic theories. In this respect, the dynamic realities of contemporary markets and organizations encourage

theories that accept and embrace pluralism, rather than treating complex and contradictory phenomena as aberrations from idealised norms (Child, 1997; Child & McGrath, 2001).

### **Decision Styles**

Decision styles can be defined as systems of constructs, methods and processes that people employ in making decisions. Two broad categories of decision style have been identified: the systematic decision style and the intuitive decision style (Scott & Bruce, 1995). Empirical studies have identified up to six different sub-types within those two broad categories (Loo, 2000; Thunholm, 2004). For example, one series of studies identified five styles: rational, intuitive, dependent, avoidant and spontaneous (Loo, 2000; Scott & Bruce, 1995). Another major study, the Stanford Project on Emerging Companies, identified five similar distinctions among the decision making styles in Silicon Valley start-ups (Baron & Hannan, 2002).

Despite those minor taxonomic differences, most researchers agree that the major categories of decision style are the systematic and intuitive. They are closely related to the comparable systematic and intuitive cognitive styles which describe types of information processing. The systematic cognitive style is analytic, deductive, rigorous, constrained and critical, whereas the intuitive cognitive style is synthetic, inductive, expansive, unconstrained, divergent, informal, diffuse and creative (Allinson et al., 2000). The intuitive cognitive style is most closely associated with the intuitive decision style and the systematic cognitive style with systematic decision making.

The systematic decision style assumes an ordered, rule-based approach to decision making. In this style, the processes and rules may be based in logico-deductive or cultural norms (March, 1997). It involves the gathering of information, logical analysis of it and then reasoning towards decision outcomes. A relatively extreme version of systematic decision means underpins the ideal of Bayesian rationality that was discussed earlier in

relation to classical economic theory (Kahneman, 2000). However, even though many now question that classical ideal, the use of systematic decision means does not always entail unbounded rationality. Indeed, people consistently employ forms of bounded rationality in systematic rule-based thought and decision making in many areas (Sloman, 1996). These processes typically include rules for information gathering and analysis, error detection and correction, cognitive control and planning. The second major decision style is the intuitive style, which is largely non-systematic in its cognitive dimensions. In contrast to systematic decision making, intuitive decision making relies on limited or representative information, non-analytic modes of judgment and the selective choice of decision outcomes (Thunholm, 2004).

In fact, the literature suggests that both the systematic and intuitive styles are common in management decision making, including decision making by entrepreneurs, and typically depend on the nature of the task situation. The question is therefore under what conditions do people use either a systematic or intuitive decision style. Indeed, as March (1997: 10) wrote in relation to decision making taxonomies generally, “the largest problem is not to choose among the alternatives but to weave them together in a way that allows each to illuminate the others.” In that regard, there is support in the literature for the contention that self-regulation, and particularly regulatory focus, plays a significant role in the selection and integration of decision means (Crowe & Higgins, 1997; Higgins, 2000a). Self-efficacy also plays a related role by influencing the confidence one has to employ selected decision means (Wood et al., 1990).

Furthermore, research suggests that some cognitive and decision styles will be more suited to either promotion or prevention regulatory focus (Friedman & Forster, 2001; Roese, Hur, & Pennington, 1999). For example, intuitive and spontaneous decision making styles may be more prevalent in decision making from a promotion focus, while dependent

and avoidant styles may be more prevalent in decision making from a prevention focus (Higgins, 2002). It has also been argued that a mix of cognitive styles may be a crucial determinant of effective innovation and organizational learning and a versatility or mix of styles is a key to the success of idea initiation and idea implementation (Sadler-Smith & Badger, 1998). A similar argument was put by Brockner et al (2004), when they proposed the energizing effect of combining regulatory foci among entrepreneur, and especially in decisions that must trade off risk and reward.

### **Theories of Risky Decision making**

Scholars have long sought to understand how people assess and approach risky decision making. They explore the factors that influence perceptions and estimations of risk, the willingness to take risks and how those factors influence risky decision making. In classical theories, risk was related to Bayesian ideals of probability and expected utility. That is, 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, the concepts of limited information and bounded rationality discussed previously have also impacted on theories of risk. Indeed, the inclusion of psycho-social factors has 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, 2000). In the same fashion, scholars in fields such as behavioral economics have explored the cognitive factors associated with bias and heuristics in risky decision making (Kahneman & Lovallo, 2000). Researchers have thereby 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).

Among the psychological factors that influence risky decision making, risk perception and risk propensity have received considerable attention. The contemporary approach to these topics is largely owing to work by Sitkin and his colleagues (Sitkin & Pablo, 1992; Sitkin & Weingart, 1995). They define risk perception as the assessment of a situation's inherent risk and define risk propensity as the willingness to take risks (Sitkin & Pablo, 1992). They argued for a complex model of risk and for risk propensity and risk perception as significant mediators of risk taking. In particular, their studies showed the distinct effects of outcome history and problem framing as key determinants of risk propensity and risk perception respectively. These factors had been overlooked and sometimes confounded in prior studies. They also identified other important factors including organizational context, problem situation and an individual's psychological and social characteristics.

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 outcome history (e.g., Kahneman & Tversky, 1979). In their seminal studies, 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 stronger 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. Based on this line of argument, 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 is largely determined by 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 in relation to risk propensity. Notably, this observation linking the apparent relationship between regulatory pride and a person's risk taking outcome history has not been made in either the self-regulation or decision making literatures. Furthermore, regulatory pride introduces a valence distinction in terms of a person's outcome history, namely, between promotion pride and prevention pride. This suggests that the analysis of risk propensity should also distinguish between a person's outcome history of success in relation to positive risk taking (the chance of making a gain) and their history of success in relation to negative risk taking (the chance of making a loss). This distinction has not been noted either in the literature.

In any case, assuming the validity of this distinction between positive and negative risk, a person with stronger promotion pride should be more willing to risk making a loss in order to pursue a gain, that is, positive risk seeking outweighs negative risk aversion. While a person with stronger prevention pride should be more willing to risk missing a gain in order to avoid a loss, that is, negative risk aversion outweighs positive risk seeking. 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. These distinctions could be very relevant to entrepreneurs, who are typically characterized as more positive risk takers. It could also help to explain why previous studies that conflate



positive and negative risk propensities have been inconclusive in relation to entrepreneurs (e.g., Brockhaus, 1980; Palich & Bagby, 1995).

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). As Sitkin and Weingart (1995: 1577) argued:

“positive frames, which emphasize situational threats to existing resources, may make the risks inherent in a situation more salient (inducing risk-averse behavior), whereas an emphasis on the upside potential for increasing limited holdings or recouping losses may decrease the salience of risks by increasing the salience of opportunities (inducing risk-seeking behavior).”

This implies that the way in which risks are framed will have a significant impact on how those risks are perceived. Positive frames will tend to stimulate more favorable risk perceptions, while negative frames will tend to stimulate less favorable risk perceptions. Importantly for this paper, 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, 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. Such outcome framing is closely related to the subject of the next section, being the role of values and ethics in decision making.

### **Values and Decision making**

Earlier in this chapter, it was noted that values and ethics operate across multiple levels and dimensions. The same is true of their role in decision making. Some decisions are social choices, based on values of the collective good. At this level, the literature contains vigorous debates. Some theories adopt socio-economic value creation as the primary criteria of social good and thus social and political decisions are deemed right and fair if they nurture such development (Machan, 1999). Other theories are grounded in more complex notions of the good, incorporating cultural values and other aspects of communal well-being (Sen, 1997). Indeed, such debates about the values that should govern society are exemplified by ideological clashes between political theories such as Marxism and Capitalism and the ethical and legal codes which accompany them.

Theoretical disputes about the nature of values and ethics are equally present in the literature on organizational decision making (March & Simon, 1993). For example, in strategic decision making within firms, managers explicitly or implicitly endorse values such as profit maximization, the rights of employees and other stakeholders and customer service. Decision are then deemed ethical in terms of doing what is right and fair in relation to those varied interests. Therefore, some managers will favor the interests of shareholders and profit maximization above all else, while others will incorporate social values into their organizational decision making (Mintzberg et al., 1998). The literature is divided over the justification and implications of these positions (Ghoshal, 2005).

At the individual level, many decisions are strongly reflective of a person's values and ethical standards. This is not disputed in the decision making literature. Rather, the ongoing debate focuses on the psycho-social versus cultural bases of values and ethics,

how individual factors interact with social factors, and what degree of universality can be attached to values and ethics, especially cross-culturally (e.g., Miller & Walzer, 1995; Rawls, 1996). The drivers of these debates are comparable to the common themes already discussed in relation to the literatures on entrepreneurship and self-regulation.

To begin with, regarding pluralism, researchers debate the degree to which personal values, human rights and associated ethical standards are universal or inherently different (Clarke & Aram, 1997; Teoh, Serang, & Lim, 1999). This question is closely related to the discussion of situational contingency; that is, are systems of values and ethics properly grounded in unchanging social and psychological factors or do they necessarily change and adapt depending on the cultural and personal situation; and if so, to what degree (Geertz, 2001).

In terms of the search for synthesis, researchers debate whether or not harmonization that can be achieved between systems of values and ethics, especially when those systems are based in deeply held religious or cultural beliefs. Finally, the literature is alive with debates about how the multiple dimensions of values and ethics relate to each other (Derry, 2002; Wood & Logsdon, 2002). That issue is particularly topical in the management and entrepreneurship literatures, in that managers and entrepreneurs often struggle to reconcile personal values and ethics with their responsibilities to the firm and shareholders (Baumhart, 1961; Brenner & Molander, 1977; Longenecker, McKinney, & Moore, 1988, 1989a). In all these ways, values and ethics have a profound impact on the self-regulation of decision making, and it is to that topic that the discussion now turns.

### **SELF-REGULATION AND DECISION MAKING**

As noted earlier, there have been relatively few studies of self-regulation and decision making. This omission is partly owing to the fundamental incompatibility that

many perceive between decision making and self-regulation (Vancouver, 2000). On the one hand, many approaches to decision making view it as a systematically ordered, linear set of processes, still anchored in the Bayesian world of determinant risk (Kahneman & Tversky, 2000a). Thus the field of decision making is frequently divided into distinct decision making styles that individuals use and adapt in response to different task situations. On the other hand, self-regulation is widely viewed as a set of complex psycho-social processes which are neither linear nor well-ordered (Vancouver & Day, 2005). Thus, combining the two areas of study has proven difficult, from both a theoretical and methodological perspective.

This apparent paradigmatic incompatibility between theories of decision making and self-regulation is partly owing to the assumption that decision making errors and extreme variance arise from motivational conflict as social-cognitive failure (Higgins, 2000b). This assumption emerged and took hold during the cognitive “revolution” of the mid-twentieth century which provided a non-motivational perspective on the limits of natural decision making (Camerer et al., 2004). That is, based on a cognitive processing view of decision making, biases and heuristics were viewed as symptoms of flawed information processing. However, as social cognitive psychologists have gained a deeper understanding of psycho-social processes in decision making, they have found more normative processes that should not be regarded as failures, but as natural and inherent aspects of natural decision making.

Of particular relevance for this thesis, Kluger et al (2004) showed that regulatory focus has a systematic effect on the estimation of probabilities and hence on the perception of prospects, and that it is therefore incorrect to assume that individuals can or should rely solely on informational inputs. Similarly, Higgins et al (1997) have explored how regulatory focus impacts on the expected utility and outcome value. 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). This distinction is similar to that between distant-proximate orientation discussed by Forster and Higgins (2005) and suggests that regulatory pride may be positively related to time horizons as factors in risk perception as well. Regarding self-efficacy and prospects, researchers have shown that a sense of self-efficacy influences the confidence a person has to employ heuristics and especially in relation to risky decision making (Cervone & Peake, 1986; Wood et al., 2000).

Other studies have investigated the role of self-regulatory processes in terms of adaptive decision making (Payne, 1997). In fact, adaptive decision making has become a focus for the cognitive perspective on decision making. Studies have shown that different strategies are selected in response to task and environmental demands and also influenced by personal characteristics (Kerstholt & Raaijmakers, 1997; Ranyard, Crozier, & Svenson, 1997). A similar conclusion is reached by Bandura (1997), who argues that generative social cognitive processes and cognitive self-efficacy and self-regulated cognition in particular, play a significant role in adaptive decision making within dynamic environments.

Moreover, within complex turbulent environments, self-regulation is even more significant. In such challenging environments, decision makers must persistently employ advanced cognitive skills to select from different options, adapt regulatory focus and decision making styles to different tasks, interpret and integrate rapid feedback, and constantly evaluate and re-evaluate the suitability of decision making styles and options (Bandura, 1997; Brockner et al., 2003). In that way, regulatory focus and self-efficacy set the range of options that an agent is likely to consider within decision making. They also

influence the selection and interpretation of information and the degree to which an agent persists and adapts in the face of obstacles or difficulties.

Thus, the social cognitive approach appears well suited to synthetic theorizing about decision making, because it combines the subjectivity of intention and cognition with the external dynamic of social and environmental change (Zimmerman, 2000). As Bandura (1997: 451) writes:

“Effective decision making in complex and dynamic environments requires a generative capability in which various cognitive skills are applied to ferret out information, interpret and integrate feedback, test and revise knowledge and implement selected options.”

From that perspective, the self is neither an idealised autonomous agent independent from the social milieu, nor a slave to social and environmental forces. Rather, the self is both consciously agentic and unconsciously emergent through interactions within the social world. Indeed, within social cognitive theories, the core of modern selfhood is typically viewed as the continuous emergence of integrative socio-cognitive thought and action in dynamic environments (Bandura, 2001; Higgins, 1998b).

Such issues of selfhood go to the heart of many ongoing debates within the social sciences about social and cognitive identity, free will and determinism, rationality and irrationality, the irreducibility of consciousness and the scope of self-regulation (e.g., Bruner, 1996; Giddens, 1984; Higgins & Kruglanski, 2000; Wegner, 2002). Many of the same issues are at the heart of debates about the nature of decision making and entrepreneurship. For example, to what extent are decision makers and entrepreneurs free agents with their own individual goals, as opposed to being constrained and driven by external forces (Krueger, Reilly, & Carsrud, 2000; Schwartz, 2002). The potential of socio-cognitive self-regulatory theories is that many of those long-standing disputes can be

accommodated in more sophisticated models of human thought and action. Old dichotomies can be mapped onto dynamic processes and traditional polarities can be reconceived as over-simplified ideals rather than accurate descriptions of reality (Higgins, 2000b).

## CONCLUSION

This chapter has reviewed the three separate bodies of literature that are related to this study: entrepreneurship, self-regulation and decision making. It did so by providing a general overview of each. At the same time, it drew out their relationships and four common themes: the trend towards theoretical and methodological pluralism, the search for more synthetic theories, an increasing interest in multidimensional approaches and a growing recognition of the fundamental contingency of human cognition and behavior. Those shared themes and the three literatures all intersect in the topic of this thesis, namely, the role of self-regulation in decision making by entrepreneurs.

When viewed in this light, the quest for researchers into entrepreneurship is to develop new theories and frameworks that can embrace multi-disciplinary pluralism, synthesis, multidimensional approaches, and recognize situational contingency, and to do so in ways that are coherent and consistent. In the following chapter, I will discuss how those themes relate to the specific literature on decision making by entrepreneurs.

## **CHAPTER 3:**

# **LITERATURE ON DECISION MAKING BY ENTREPRENEURS**

### **INTRODUCTION**

Chapter 2 highlighted four common themes that infuse the literatures on entrepreneurship, self-regulation and decision making. These themes are a trend towards theoretical and methodological pluralism, a related search for synthetic frameworks and theories, an increasing interest in multidimensional theories and approaches, and recognition of the fundamental contingency of human cognition and behavior. When combined with the three literatures on entrepreneurship, self-regulation and decision making, these themes focus attention on the topic of this thesis, namely, the role of self-regulation in decision making by entrepreneurs. This chapter will review the specific literature on decision making by entrepreneurs.

This chapter will discuss the following topics. Firstly, it will address the environmental context of decision making by entrepreneurs and how entrepreneurs might differ from managers in terms of their decision making behavior and self-regulatory characteristics. This chapter will then discuss the major categories of decisions which scholars have identified as central to the field of entrepreneurship, namely career choice, opportunity evaluation, opportunity exploitation, and the pursuit of value creation and new enterprise emergence (Busenitz et al., 2003; Davidsson et al., 2001; Mitchell et al., 2004; Shane & Venkataraman, 2000b).

The chapter will then review important factors in decision making, mirroring the discussion of parent literatures in Chapter 2. Once again, the discussion will focus on those



factors which have been identified by scholars as central to any explanation of cognition and decision making by entrepreneurs (see Baron, 2004a; Mitchell et al., 2004). Those factors include the specific topics of risky decision making in relation to opportunities (Frese et al., 2002; Palich & Bagby, 1995; Sarasvathy, 2001), the use of heuristics (Busenitz & Barney, 1997; Simon & Houghton, 1999), the implications of heuristic bias (Baron, 1998; Forbes, 2005a; Simon et al., 2000), decision speed (Bhide, 2000; Brown & Eisenhardt, 1997; Casson, 1997) and the role of values and ethics in decision making by entrepreneurs (Hannafey, 2003; Sarasvathy, 2002). The discussion of these topics will result in the propositions that shall frame the rest of the thesis.

### **The Entrepreneurial Context**

Many researchers locate decision making by entrepreneurs in dynamic, uncertain environments that are characterised by change and disequilibrium (Baron, 1998; Sarasvathy, 2001; Slevin & Covin, 1997). There was a time when such environments were regarded as more unusual and entrepreneurial, as not typical of business in general (cf. Knight, 1921; Schumpeter, 1934). However, in the recent management literature, even managers in established firms are said to make decisions under these conditions. That is, dynamism, complexity and uncertainty increasingly characterise the business environment for decision making in firms, whether old or new (Brown & Eisenhardt, 1998; Child & McGrath, 2001).

The intensity of such environments places significant stress and cognitive load on decision makers. To be effective, they need to manage that stress. Managers, whether entrepreneurs or not, must therefore be competent at a range of adaptive cognitive skills when making decisions. They need to be adept at shifting cognitive load, using cognitive short cuts or heuristics appropriately, adjusting attention and commitment levels, and

making rapid decisions in many instances. Underpinning many of those cognitive skills is the ability effectively to self-regulate oneself.

Indeed, self-regulatory characteristics are observed in successful innovative companies generally, where there is the requirement constantly to respond to hyper-competitive challenges (Tushman & O'Reilly, 1997). Eisenhardt (1999) observed adaptive capability in entrepreneurial and diversified businesses, where decision making can be deliberately rational in some respects, while emergent in other respects. She found bounded rationality in some areas, but unbounded rationality in others. In that way, regulating complex cognitive challenges and multiple forms of intelligence enables effective strategic leadership and decision making (Murphy, 2002). Thus, in responding to environmental conditions, entrepreneurs and managers alike self-regulate their decision styles and means, depending on the tasks at hand and other situational contingencies (Casson, 1997; Mitchell et al., 2002).

### **Entrepreneurs and Managers**

Despite evidence that entrepreneurs and managers share increasingly similar decision making environments (Brown & Eisenhardt, 1998; Casson, 1997), some scholars still maintain that entrepreneurs and managers differ in significant ways. They are seen to differ in terms of the organizational and environmental challenges they face (Baumol, 1993), their personal goals and motivations (Stewart et al., 1999), and in terms of the skills and capabilities they must bring to their management tasks (Busenitz et al., 2003). In particular, some scholars argue that entrepreneurs are significantly distinguished in terms of their cognitions and decision making behavior in the evaluation and exploitation of opportunities (e.g., Baron & Ward, 2004; Forbes, 1999; Mitchell et al., 2004).

There is significant evidence to support these arguments. For example, Busenitz and Barney (1997) found that entrepreneurs exhibit more overconfidence and a greater

reliance on the representativeness heuristic in their decision making, when compared to managers. They showed that entrepreneurs are more likely to base responses to decision scenarios on subjective opinions, rather than on statistical reasoning. Allinson (2000) showed that entrepreneurs process information more intuitively than managers. While Palich and Bagby (1995) found that entrepreneurs categorized risky business scenarios more positively than managers. This finding supports the contention that entrepreneurs are better understood as opportunists who accept the risky nature of new opportunities, rather than as risk-lovers per se (Forbes, 2005a). Building on that insight, Busentiz et al (2003) have called on scholars to investigate how prospect theory may illuminate entrepreneurial opportunity recognition and especially the differences with managers. They suggest that, rather than focusing on current industry standards, entrepreneurs tend to focus more on future goals or prospects as their reference point.

However, other studies have shown that entrepreneurs and senior executive managers are similar in their approach to strategic decision making. Situational factors may be just as important in determining how such decisions are made and not simply the predispositions of the decision makers themselves (e.g., Papadakis, Lioukas, & Chambers, 1998). In addition, risk propensity among strategic decision makers appears to vary from industry to industry (Pablo, 1999), but comparisons between entrepreneurs and managers have seldom controlled for such factors (Davidsson, 2005; Markman et al., 2002). Finally, other studies have shown that executives in both small and medium-sized enterprises use intuitive thinking and heuristics when making important strategic decisions (Sadler-Smith & Shefy, 2004). This suggests a potential pattern of sampling bias in some of the studies that show significant differences between entrepreneurs and managers.

The literature exhibits a similar debate about comparing the self-regulatory characteristics of entrepreneurs and managers. For example, some scholars have suggested

that distinguishing self-regulatory characteristics may enable successful entrepreneurs to employ adaptive and heuristic thinking more effectively (Baron, 2004a). That is, more successful entrepreneurs may be more adept at using heuristics and intuitions when needed, while switching to systematic decision making when the need arises. This requires relatively strong skills of self-regulation, underpinning the capacity to switch decision styles depending on the decision making tasks at hand. Whereas, others argue that managers may rely on a heuristic decision style in inappropriate situations or more typically, or consistently employ a systematic decision style even when heuristics are warranted (Thunholm, 2004).

Other evidence suggests that successful entrepreneurs are more proficient at formulating effective heuristics for making fast decisions. They also appear to be more proficient at switching decision making styles and regulatory foci in decision making. That is, they act from a stronger prevention focus and employ appropriate vigilance means when they need to avoid losses, while acting from a stronger promotion focus and employ eagerness means when they are seeking to attain gains (Baron, 2004a; Brockner & Higgins, 2001). In addition, the literature suggests that entrepreneurs possess a stronger sense of self-efficacy in the entrepreneurial task domain, compared to managers (Bandura, 1997; Markman & Baron, 2003). Overall, therefore, the literature suggests that entrepreneurs may differ from managers in terms of their self-regulatory characteristics. The literature also strongly implies that entrepreneurs' self-regulatory characteristics play a significant role in their decision making. The first and second propositions are therefore as follows.

**Proposition 1**

***Entrepreneurs' self-regulatory characteristics distinguish them from managers.***

**Proposition 2**

***Entrepreneurs' self-regulatory characteristics play a significant role in their decision making.***

The following sections of this chapter will review specific aspects of decision making by entrepreneurs and derive additional propositions about the role of self-regulation in these decision processes.

**DECISION STYLES**

As noted in Chapter 2, the literature suggests that self-regulation is related to decision styles (Thunholm, 2004). A person's self-regulatory attributes largely determine their approach to goal-oriented action, which in turn influences the decision means they employ in goal setting and goal pursuit. In Chapter 2, I also noted that decision styles are closely related to, although distinct from, cognitive styles. Two broad categories of cognitive and decision styles were identified: the systematic style and the intuitive style (Scott & Bruce, 1995).

A number of scholars have applied this taxonomy of decision styles in studies of systematic and intuitive decision making by entrepreneurs (Baron, 2003a; Busenitz & Barney, 1997; Sadler-Smith & Badger, 1998; Slovic et al., 2002; Ucbasaran et al., 2001). Most argue that entrepreneurs are inclined to use the intuitive decision style. For example, a study by Sadler-Smith and Shefy (2004) gathered data from owner-managers and managing directors of small and medium-sized firms in two contrasting sectors. The results showed a positive relationship between intuitive decision style and contemporaneous financial and non-financial performance. Furthermore, they observed a statistically

significant relationship between intuitive decision style and subsequent financial performance. The main implication being that intuitive decision making is significant in the explanation of entrepreneurial action.

Other studies show that entrepreneurs typically employ more intuitive decision styles in relation to information search and the use of heuristics (e.g., Cooper, Folta, & Woo, 1995). This finding is reinforced by Allison et al (2000), who reported that entrepreneurs, in contrast to managers, typically employ more intuitive modes of information processing rather than systematic approaches. It is important to recall here that patterns of information search and processing, choice of decision means, and the degree of heuristics used in decision making, are related to the strength of a person's domain self-efficacy and chronic regulatory focus (Higgins et al., 2001; Wood et al., 1990).

Sarasvathy (2004a) extended this area of research by arguing that entrepreneurs engage in more symbolic modes of thought which find expression in intuitive decision making under uncertainty. Indeed, Sarasvathy's (2001) seminal concept of effectuation asserts that decision means precede goals and exclude deterministic methods of goal pursuit. She argued that entrepreneurs choose between many possible effects using a particular set of decision means, rather than choosing between means to create a given effect. The "effectuator merely pursues an aspiration and visualizes a set of actions for transforming the original idea into a firm, not into the particular predetermined or optimal firm" (Sarasvathy, Simon, & Lave, 1998: 249). This approach entails a strong degree of intuitive decision making, and mirrors the analysis by Knight (1921: 232) when he referred to the "effectuating" devices that organizations employ in the management of risk.

Overall, however, like much research into entrepreneurial cognition and decision making, the investigation of intuitive decision making by entrepreneurs is still in its early stages. In fact, Mitchell et al (2005) recently described this area of study as "a mess." Time

will tell whether or not their attempt to clarify the constructs, antecedents and consequents of “entrepreneurial intuition” helps to sort out this “mess.” In the meantime, the extant literature suggests that self-regulation plays a significant role in the selection and use of decision styles by entrepreneurs.

**Proposition 3**

***Entrepreneurs’ self-regulatory characteristics influence their decision making style.***

Propositions 2 and 3 suggest that entrepreneurs employ distinctive styles and self-regulatory characteristics in decision making. The following sections will discuss those issues further in relation to the following specific decisions and aspects of decision making: entrepreneurial career choice, opportunity evaluation and exploitation, risk taking, the use of heuristics, the management of heuristic bias, decision speed, and the role of values and ethics in decision making by entrepreneurs. As the chapter progresses, I will develop additional exploratory propositions which refer to those specific areas and aspects of decision making.

## **ENTREPRENEURIAL CAREER CHOICE**

One of the major goal setting decisions related to entrepreneurship is the decision to become an entrepreneur (Baron, 2004a; Bird & Jelinek, 1988). The importance attached to this decision reflects the significance of entrepreneurs as people who are prepared to accept the challenges associated with this career choice, and who are capable of identifying and exploiting of new opportunities. Scholars have identified a range of factors that may predispose individuals to make such a career choice. Some point to personal factors such

as family and cultural context (Greve & Salaff, 2003; Mitchell et al., 2000). Others stress personality factors such as achievement motivation and the need for independence (Johnson, 1990; McClelland, 1961; Miner, 2000). One recent study found that factors such as the desire for self-realization, financial success, innovation and independence also play a major role (Carter, Gartner, Shaver, & Gatewood, 2003).

In addition, scholars have studied the cognitive factors associated with choosing an entrepreneurial career, such as cognitive alertness, pattern recognition, scenario thinking and related decision styles (Baron, 2006; Busenitz, 1996; Forbes, 1999; Gaglio, 2004). Significant attention has also been given to the cognitive factors involved in the formation of entrepreneurial intentions, risk perception and risk propensity, and the degree to which entrepreneurs differ from other managers in those respects (Baron, 2004a; Busenitz & Barney, 1997; Krueger et al., 2000; Lee, 2004).

A few scholars have also pointed to self-regulatory factors in entrepreneurial career choice. For example, some studies have investigated the role of self-efficacy in this regard, arguing that those with stronger entrepreneurial self-efficacy are more likely to choose an entrepreneurial career (e.g., Markman et al., 2002; Scherer et al., 1989). In his PhD thesis, McMullen (2003) reported that self-regulatory focus plays a significant role in firm-level intentions towards entrepreneurial action. Most notably for my own thesis, Hmieleski's (2005) recent PhD thesis showed that both entrepreneurial self-efficacy and regulatory focus have a significant influence on the degree of fit between an individual's psychosocial profile and the demands of entrepreneurial action.

These prior studies reinforce the literature on core self-evaluation, which incorporates concepts of self-efficacy (Hiller & Hambrick, 2005). In addition, research indicates that family and professional history play a role in deciding to become an entrepreneur, and those factors also play a major role in determining a person's sense of



regulatory pride (Baron, 2004b; Brockner et al., 2004). More specifically, a sense of past success in attaining gains may incline someone towards entrepreneurial pursuits (Petrakis, 2005; Vecchio, 2003) and the same history tends to foster a sense of promotion pride (Higgins et al., 2001). Overall, the literature suggests the following proposition:

**Proposition 4**

***Entrepreneurs' self-regulatory characteristics influence the decision to adopt an entrepreneurial career.***

## **OPPORTUNITY RISK**

Since the seminal work by Schumpeter (1934), and especially in more recent times, leading scholars have regarded the way in which individual entrepreneurs recognize, evaluate and exploit new opportunities as central questions for the field (Busenitz et al., 2003; Davidsson et al., 2001; Ireland et al., 2005; Shane & Venkataraman, 2000b). The following sections review the literature on those distinct phases of the entrepreneurial process with special attention to issues of decision making.

### **Opportunity Recognition and Evaluation**

The literature distinguishes the evaluation of opportunities from the process of recognizing opportunities in the first instance (Krueger, 2000; Ucbasaran et al., 2001). Evaluation leads towards the decision to pursue an opportunity or not, but the opportunity needs to be recognized or imagined first. Regarding this initial step of opportunity recognition, it is regarded as an important aspect of entrepreneurship because it often entails particular cognitive skills, such as pattern recognition and alertness schema, which

enable entrepreneurs to perceive and imagine new markets and product opportunities that others do not (Baron, 2004a; Gaglio & Katz, 2001; Kirzner, 1998).

In addition, entrepreneurial opportunity recognition often takes place with limited information where much remains unknown and decision making under these conditions therefore requires a strong tolerance of systemic uncertainty and ambiguity (Bhide, 2000; McMullen & Shepherd, 2006; Sarasvathy, 2004a). This may be contrasted with business opportunities, more broadly defined, which tend to involve optimizing efficiencies and competing in established markets, managing change in mature organizations, and the redistribution of resources into new configurations (Kirzner, 1998; Shane & Venkataraman, 2000a).

Environmental factors also influence entrepreneurial opportunity recognition. New opportunities arise within emergent markets around disruptive innovations, often with untested business models, and typically entail significant risk (Tushman & Anderson, 1997). Recognizing and imagining such opportunities thus involves the early detection of market trends, exploratory innovation, novel design skills and a willingness to take associated risks. Scholars have therefore asked why some people and not others recognize or imagine entrepreneurial opportunities. Some have explored the possession of prior information and experience related to new opportunities and the cognitive properties required to recognize them (Choi & Shepherd, 2004; Forbes, 1999; Shane, 2003). Cognitive factors that have been nominated include information search, creativity, pattern recognition and the use of heuristics and alertness schema (Baron & Ward, 2004; Gaglio, 2004).

Some scholars distinguish the nature of environmental uncertainty from risk per se. Following Knight (1921), they argue that entrepreneurial situations and enterprises are characterized by environmental and informational uncertainty, and that normative concepts

of measurable risk are often inappropriate at the early stages of new opportunity recognition and evaluation (e.g., Davidsson, 2005; Dew et al., 2004). Sarasvathy (2004a), in particular, has used this distinction as a key component of effectuation theory, which is grounded upon the indeterminacy of new opportunity emergence. In the same vein, McMullen and Shepherd (2006) recently proposed a model of entrepreneurial action which integrates both cognitive factors and systemic environmental uncertainty to explain the willingness of individuals to pursue opportunities.

However, scholars criticize some of the research on these topics for failing to clearly characterize the nature of entrepreneurial opportunities themselves (Davidsson, 2005; Singh, 2001). They argue that the vague definition of what constitutes an opportunity undermines attempts to portray opportunity recognition as a distinguishing feature of entrepreneurship. A better definition would incorporate both cognitive and situational factors, in terms of the “individual-opportunity nexus” to use Shane’s (2003) term. At the same time, and in contrast to Shane’s advocacy of the pre-existent status of opportunities, Davidsson (2004; 2005) admits the potential for both the discovery and creation of new opportunities.

These debates are related to the nature of decision making about new opportunities and to the question of whether or not entrepreneurs are atypical in their use heuristics and intuitive reasoning, for example, in making decisions about new opportunities (Allinson et al., 2000; Keh, Foo, & Lim, 2002). Some scholars have argued that these capabilities are not unique to entrepreneurs engaged in new venture formation, but can occur within established firms as well. That is, they claim that individuals and teams within existing organizations also possess and exercise the cognitive skills and dynamic capabilities required for new opportunity recognition (Ancona, Goodman, Lawrence, & Tushman, 2001; Shane, 2003; Shepherd & Krueger, 2002). In fact, some scholars have proposed

entrepreneurial theories of the firm that include opportunity recognition as a fundamental component (Alvarez & Barney, 2004; Alvarez & Busenitz, 2001; Dew et al., 2004). The questions then become why do some firms succeed and others fail in opportunity recognition and why do some opportunities get spun out of existing firms. These topics also concern those who research the entrepreneurial orientation and emergence of firms (Lichtenstein et al., 2006; Lumpkin & Dess, 2001).

In any case, having recognized potential opportunities, entrepreneurs then evaluate which ones to pursue. The literature treats this as a discrete decision task, but from different perspectives. From the viewpoint of strategic decision making, opportunity evaluation has been linked to the firm's entrepreneurial orientation, expressed in terms of autonomy, innovativeness, competitive aggressiveness, pro-activeness and risk taking (Lumpkin & Dess, 1996). Opportunity risk taking, in particular, has been explained in terms of a stronger propensity for risky opportunities as both a firm behavior (Covin & Slevin, 1991) and distinctive individual cognitive attributes (Shaver & Scott, 1991).

Others report no evidence of higher risk propensity among entrepreneurs regarding new opportunities, but rather that entrepreneurs perceive such risks differently in the first instance (Brockhaus, 1980; Palich & Bagby, 1995), possible because of the informational asymmetries typically encountered in entrepreneurial situations (Janney & Dess, 2005). Indeed, research suggests these process may be more complex and significantly influenced by, and contingent upon, the behavioral and situational features of specific opportunities (Das & Teng, 1997; Forlani & Mullins, 2000; Petrakis, 2005). Of particular relevance for this thesis, both strong promotion pride and strong self-efficacy have been shown to be positively associated with framing opportunities as positive risks, that is, as chances to make gains (Mohammed & Billings, 2002).

## **Opportunity Exploitation**

Having identified an opportunity and then decided to pursue it, the opportunity must then be exploited operationally. Thus, opportunity exploitation is regarded as another fundamental area of decision making by entrepreneurs (Shane & Venkataraman, 2000a). Some have looked to theories of the firm and argued that entrepreneurs possess a particular approach to the gathering and managing of the resources (including cognitive resources) required to exploit new opportunities (Alvarez & Busenitz, 2001). This approach places opportunity exploitation within the traditional framework of resource-based analysis. Others have located opportunity exploitation within network theories, stressing the role of strategic partnerships and the acquisition of social capital by entrepreneurs (De Carolis & Saparito, 2006).

On the other hand, Sarasvathy (2001) has rejected conventional means-ends theories of exploitation and proposed a theory of “effectuation” as a new model of exploiting contingencies. She conceded that causation models are appropriate in some circumstances, for example, in established markets where relations and resources are relatively well defined. However, in highly contingent situations characterized by high uncertainty and ambiguity, Sarasvathy (2004a) argued that traditional causation models of opportunity exploitation and new firm emergence do not suffice. She therefore proposed a theory of “effectuation” instead, which is based on the effect that agents imagine and intend through their actions, rather than the outcomes they seek to cause or predict.

Other scholars have explored the distinguishing cognitive features of opportunity exploitation (Mitchell et al., 2004). They argue that opportunity exploitation requires a willingness to engage in the entrepreneurial process, the ability to manage organizational arrangements, and the ability to orchestrate those arrangements effectively. From that perspective, understanding opportunity exploitation requires analysis of cognitive

attributes related to task motivation, planning, negotiation and leadership (Mitchell et al., 2002). In the context of entrepreneurial opportunity exploitation, these processes can be viewed in a pluralistic light, interpreting the related cognitions within various theoretical frames. They can be viewed as a particular kind of opportunity/ability script and understood as either a causal means/ends relationship or an effectuation process (Mitchell et al., 2004).

### **Risk Taking**

As the preceding discussion has shown, risk taking is a common theme in the literature about decision making by entrepreneurs regarding opportunities. Entrepreneurial risk taking has been explored and explained in terms of organizational behavior, strategic decision making, personality traits and cognitive processes. The debates continue. For example, some scholars continue to seek an explanation of entrepreneurial risk taking in terms of personality traits, although some acknowledge that such studies need to admit greater complexity and heterogeneity (Korunka et al., 2003; Miner & Raju, 2004). For the same reasons, Das and Teng (1997) argued 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. For example, Palich and Bagby (1995) used a cognitive approach to argue that entrepreneurs may not possess stronger risk propensity and weaker risk perception, but rather that they are merely perceive stronger positive risks or 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 may tend to view some situations as positive opportunities, while others perceive the same

circumstances as more negative. This distinction supports the relationship between risk perception and regulatory pride described earlier, 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.

In another study of cognitive factors in entrepreneurial risk taking, Krueger and Dickson (1994) showed 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.

Collectively, the literature therefore suggests complex relationships between situational uncertainty, perceived risk, personal history, and self-regulatory factors such as regulatory pride and self-efficacy. People who have a sense of success in past risk taking will possess stronger self-efficacy and be more inclined to take similar risks in future. In addition, such a history of success is also related to framing risks more positively and thus more positive opportunity risk perception. In summary, the literature suggests that self-regulation will play a significant role in risky decision making by entrepreneurs about opportunities.

**Proposition 5**

***Entrepreneurs' self-regulatory characteristics influence risky decision making about opportunities.***

## HEURISTICS AND DECISION MAKING

As noted earlier, risky decision making by entrepreneurs often occurs in situations where there is limited time and information, putting strain on cognitive resources. The same situations and conditions promote the use of heuristics in information search and subsequent decision making (Busenitz et al., 2003; Cooper et al., 1995). Therefore, because entrepreneurs often make decisions in situations of limited time and information, they need to employ cognitive short-cuts as heuristics. Thus, heuristics are part of a psychological account of the ways in which the situational context influences the cognitive processes of entrepreneurs (Shaver & Scott, 1991).

In that respect, heuristics are a response to the contextual complexity and uncertainty which characterize many decision making tasks encountered by entrepreneurs, calling for adaptive cognitive functioning and effective self-regulation (Brockner et al., 2003). Indeed, entrepreneurs tend to rely less on established rules, procedures and modes of vigilance, and tend to be more eager in seeking, selecting and processing new information to address decision making tasks. Self-regulation and self-regulated cognition are also important in goal setting within dynamic complex environments (Bandura, 1997; Baron, 2003a). Furthermore, robust promotion-focus and strong cognitive self-efficacy are also required to sustain motivation and the pursuit of goals in the face of uncertainty and setbacks (Latham & Locke, 1991).

As noted earlier, in classical economics and much formal decision theory, heuristics are typically associated with irrationality and cognitive errors, and strenuous attempts are made to minimize their impact and relevance (Kahneman, 2000). That view is even shared by some of those who recognise the inevitability and utility of heuristics in decision making (Thaler, 1999). They regard heuristics as less than rational and requiring remedial intervention (e.g., Heath & Tindale, 1994). In contrast, other scholars of



behavioral decision making advocate a more naturalistic, psychological and ecological approach to heuristics in decision making, and fully reject the classical ideal of rationality (Schwartz, 2002). They argue that heuristics can be an intelligent decision making strategy in the face of limited cognitive capacity and where goals “extend beyond analytical accuracy to include effort minimization, ease of justification and avoidance of negative emotions” (Payne & Bettman, 2001:123).

As discussed in Chapter 2, working within such a behavioral paradigm, Gigerenzer et al (1996) have identified what they refer to as “Fast and Frugal Heuristics.” These are simple heuristics that people use when they need to make rapid adaptive decisions or have limited time and information. These Fast and Frugal Heuristics include “take the best,” which uses the best cue initially and then bases decision upon it. Another is the "minimalist" heuristic, which bases a decision on the first reason that comes to mind (Gigerenzer et al., 2002). Such heuristics are especially important in adaptive decision making, allowing people to react flexibly within complex uncertain situations (Gigerenzer, 2000).

The literature suggests that such heuristics play such a role within entrepreneurship. Given the varied motives, beliefs and behaviors, required for entrepreneurial success and the very different task demands they encounter, entrepreneurs need the capability to switch and adapt their decision making styles and tools (Baron & Ward, 2004). The use of heuristics appears to enable that kind of adaptive decision making by entrepreneurs. The same may also apply to regulatory focus, as entrepreneurs need to shift between preventing losses and seeking gains in dynamic choice situations (Brockner et al., 2003). Thus, heuristics function as mechanisms for adaptive decision making, enabling entrepreneurs to adapt decision making styles and strategies in response to dynamic task demands and environmental conditions.

However, in much of the entrepreneurship literature, heuristics continue to be studied from the classical perspective assuming they are inherently biased and error-prone (Baron & Ward, 2004). Scholars have therefore focussed on the problematic aspects of heuristics, such as overconfidence, representativeness errors and belief in the law of small numbers (e.g., De Carolis & Saporito, 2006; Forbes, 2005a; Shane, 2003). However, even though there is evidence that heuristic bias and error do occur within decision making about opportunities (e.g., Busenitz & Barney, 1997), that may only be part of the story. If one adopts a more behavioral perspective, and does not assume that heuristics are necessarily related to bias and error, then other forms of effective heuristic decision making may be found such as the use of Fast and Frugal Heuristics (Gigerenzer et al., 2002). Heuristics can then be conceived as mechanisms whereby entrepreneurs manage and mitigate the impact of stressors in decision making, rather than as symptoms of extreme bias and error.

**Proposition 6**

***Entrepreneurs' self-regulatory characteristics influence the use of heuristics in decision making.***

**STRESSORS AND HEURISTIC BIAS**

The previous section explained that for many scholars, heuristics are inextricably linked to questions of bias and cognitive error in decision making. Environmental turbulence, constant change and high uncertainty are viewed as common causes of the psycho-social stressors which give rise to such bias and error (Camerer & Loewenstein, 2004). Scholars argue that these stressors also lead to extreme heuristic bias among

entrepreneurs (Baron, 1998; Forbes, 2005a; Miner & Raju, 2004). These issues have therefore become major topics of research in the literature on entrepreneurship. Indeed, many of the common heuristic biases have also been observed within decision making by entrepreneurs: affect intrusion, attribution error, self-serving bias, the planning fallacy and self-justification (Baron, 1998); overconfidence or representativeness errors (Busenitz & Barney, 1997); the illusion of control and misguided belief in the "law of small numbers" (Simon & Houghton, 1999; Simon et al., 2000). However, as noted earlier, heuristics can also be viewed as important means by which entrepreneurs manage stressors such as informational intensity, uncertainty, time pressures and high emotion in decision making (Baron, 2003a; Simon & Houghton, 2002). Indeed, without heuristics, decision making could become virtually unattainable within the complex uncertain environments typical of entrepreneurship (Busenitz & Barney, 1997).

Heuristics can also be linked to self-regulatory characteristics such as promotion focus and self-efficacy. For example, entrepreneurial ambitions rely on a robust sense of positive goal pursuit and self-efficacy to sustain effort in the face of uncertainty, stress and discouragement. However, the resulting strong promotion focus and sense of self-efficacy can sometimes lead to planning fallacy, over-confidence, the illusion of control and other biases (Bandura, 1997; Higgins, 2002; Markman et al., 2002). These biases may then contribute to significant cognitive errors in judgment, such as underestimating competition, overestimating demand and overlooking critical resource needs (Simon & Houghton, 2002). Certain stressors can also degrade self-regulatory functioning (Karoly, 1993; Karoly et al., 2005). This can occur when individuals are seeking to pursue multiple and possibly conflicting goals at the same time and thus self-direction towards those goals becomes conflicted and impaired.

In order to analyze the role of self-regulation in these processes, self-regulation must be viewed in the context of personal, behavioral and environmental factors. Decision making by entrepreneurs can then be seen in the context of social cognitions within socio-cultural networks. That is, entrepreneurs do not make decisions in a vacuum as isolated individuals, but in an environment of inter-connected intelligent agents and social forms (Bass, 2002; Perfect & Schwartz 2002; Tushman & Anderson 1997). They are observed to possess a variety of cognitive constructs (also described as mental models, scripts or schemas) and a multiplicity of intelligences that are selectively employed in making decisions (Mitchell et al., 2000). Another recent study showed the mediating role of culture in the use of expert scripts in venture creation decisions (Simon, 1992).

Importantly, the literature suggests that self-regulation may play a role in managing the negative impact of stressors on decision making by entrepreneurs (Baron & Ward, 2004). Assuming a social cognitive framework for decision making, self-regulation may play a significant role in limiting extreme heuristic bias and cognitive errors, especially through ensuring good fit between regulatory focus and decision means, on the one hand, and cognitive style and goal orientation on the other (Higgins, 2002). The following sections of the paper discuss the major stressors often experienced by entrepreneurs in decision making.

### **Time Pressure**

As noted earlier, entrepreneurs make decisions within an increasingly turbulent business environment characterized by disruptive technological innovation, high velocity markets, hyper-competition and dynamic business alliances (Brown & Eisenhardt, 1997; D'Aveni, 1999; Tushman & O'Reilly, 1997). This environment has also been described as information intensive, in the sense that modern economies are increasingly based on information flows rather than the exchange of material goods (Casson, 1997; Child &

McGrath, 2001). Entrepreneurs must therefore respond to dynamic opportunities and are pushed by competitive pressures to pursue relentless change (Gersick, 1994; Perlow, Okhuysen, & Repenning, 2002). These environmental trends – turbulence, competition and informational intensity – impose significant time pressures on decision making by entrepreneurs (Bhide, 2000; Payne, 1997). That is, decisions must be made quickly and external pressures do not allow much time to gather further information or investigate alternative options.

Studies have shown that decision making under time pressure can result in reduced quality of decisions, weaker self-confidence levels, and generally stimulate more extreme forms of heuristic bias and cognitive errors (Maule & Edland, 1997). Such errors can include stronger risk taking propensities because decisions must be made quickly and also the tendency to increase the importance of internal sources of information at the expense of external sources, especially from a promotion focus (Förster et al., 2003). More broadly, time pressures stimulate changes in underlying cognitive processing such as the filtration and omission of relevant information and increased use of attribute-based processing, thereby changing the relative importance of positive and negative sources of information and reducing the overall attractiveness of alternatives. Many of the same errors have been identified as typical failings within decision making by entrepreneurs: over-confidence, affect infusion (where emotions function as reasons), self-serving attribution style, the planning fallacy (tending to ignore the past), under-estimation of risk and self-justification (Baron, 1998).

On the other hand, some of the same studies show that the negative impacts of time pressure can be mitigated if decision makers already know which strategy or style to employ under pressure (Maule & Edland, 1997); that is, when they are capable of self-regulating their decision making styles and means. Furthermore, there is evidence that

moderate levels of time pressure are normative and required for effective decision making and may even improve it. For example, strategy selection for a particular choice problem is significantly based on time pressures (Kerstholt & Raaijmakers, 1997). Together, all these findings suggest that self-regulation is a significant factor in the management of decision making by entrepreneurs under time pressure and plays an important role in limiting the cognitive errors that typically occur in those situations.

### **Uncertainty**

Just as complex turbulent environments give rise to time pressures, so they create high uncertainty – that is, it is difficult to predict outcomes when novelty and constant change are the norm. In classical economic theory, on the other hand, the possibility of certainty was assumed. Subject Expected Utility assumed “that decisions should be reached by summing over the set of alternatives the utility of each alternative weighted by the subjective probability of its occurrence” (Crozier & Ranyard, 1997:5). More recent behavioral economists and social psychologists recognise the practical limitations of that approach and argue that the belief in strong economic rationality ignores the behavioral and cognitive complexities of actual decision making (Higgins, 2002; Kahneman & Tversky, 2000a; Schwartz, 2002; Slovic et al., 2002). As noted earlier, many have embraced the notion of bounded rationality developed by Simon (1997) and his concept of satisficing. These scholars eschew frameworks assuming static organizational forms, idealised markets and unbounded rationality, and many have adopted the alternative concepts of heuristics and prospects (Schwartz, 2002).

Scholars of entrepreneurship have widely embraced these findings and noted that decision making by entrepreneurs is complex, multidimensional and often occurs under high uncertainty (Baron, 2003b; Bhidé, 2000; Busenitz & Barney, 1997; Davidsson, 2005; McMullen & Shepherd, 2006). In fact, there is some evidence that systemic uncertainty

encourages entrepreneurial behavior (Dess, Lumpkin, & Covin, 1997). There is also evidence that high environmental uncertainty can be beneficial for entrepreneurial company performance (Dess et al., 1997). In any case, the irreducible nature of uncertainty – meaning it cannot be eliminated before a decision is made – has been recognized for some time and was the basis of the so-called “lens model” which depicted decision makers accessing only partial reality as if through a lens (Hastie & Dawes, 2001). While some studies have shown that specific strategies can limit the cognitive errors owing to uncertainty, those errors cannot be eliminated completely (Hodgkinson, Bown, Maule, Glaister, & Pearman, 1999).

The major biases arising from uncertainty are over-confidence, misperception of risk and framing bias. Over-confidence causes decision makers to be too sure of their own assessments and failing to recognize the actual uncertainty of their own decisions (Simon & Houghton, 1999). On the other hand, a moderate level of over-confidence and a resilient sense of self-efficacy in the face of uncertainty may be important factors in entrepreneurial persistence and the preparedness to take risks (Bandura & Locke, 2003). Ironically, optimistic denials of uncertainty may also allow decision makers to view themselves as prudent and thereby under-estimate risk (Kahneman & Lovallo, 2000). That is, by not recognizing the uncertainty of their decisions and the associated risk, decision makers can maintain the belief that they are prudent. Therefore, just as uncertainty is constant and irreducible, so is the tendency towards over-confidence and under-estimation of risk. However there is evidence that these cognitive errors can be limited by the adoption of specific cognitive strategies (Bandura, 1997; Hodgkinson et al., 1999).

### **High Emotion**

Another stressor that often impinges on decision making is that of emotional pressure. This aspect of decision making has been accorded less attention by

entrepreneurship researchers. This relative neglect may be owing to the general trend away from concern with personality traits towards cognitive factors. That is, instead of investigating entrepreneurs as atypical personalities and psycho-social outliers, recent scholarship has focussed on exploring the social cognitions and behaviors exhibited by entrepreneurs (Mitchell et al., 2002).

However, a level of unresolved emotional conflict remains inevitable within all social and organizational contexts. Contractual relations simply cannot capture and resolve the different goals and interests held by multiple individuals (Cyert & March, 1992). Entrepreneurial settings are especially prone to such emotional and relational conflict because they are often highly unstructured and involve intensely personal ambitions. In addition, new entrepreneurial firms often lack formal employment contracts and key roles may be ill-defined. This means that personal factors are less constrained and affective states intrude more forcefully into decision making. As a result, during the early stages of new venture emergence, conflicts often arise for emotional or relational reasons, rather than for strategic or organizational reasons (Baron, 1998).

One major consequence of such conflict is affect intrusion, that is, when emotional states intrude into decision making. Through affect priming, for example, emotions impact on decision making by influencing the ease with which information consistent with such emotions can be brought to mind (Baron, 1998). This can result in the erroneous selection and reliance on information that reinforces positive emotions. Another negative impact is "affect-as-information," whereby emotional states influence decisions by serving as a heuristic, that is, as a short-cut for inferring reactions to a specific person, event or environmental stimulus. Counter-intuitively, such heuristic biases also occur in deliberate, considered thought where there is a strong goal orientation and inferential reasoning, rather than in highly emotive situations (Wood et al., 2000).



Other emotional stressors and relational conflicts can arise because of self-serving attributions or attribution errors, whereby decision makers attribute positive outcomes to themselves and negative outcomes to others, and especially when negative outcomes are perceived to result from another person's over-confidence or under-estimation of risk. This could easily occur when there is a conflict of regulatory focus – one person has a dominant promotion-focus, while the other person has a dominant prevention-focus. As a result, decision making becomes highly personalized. Within small entrepreneurial teams, ambitions are strong and pressures intense, often leading to emotional conflict.

However, as Bandura (2001) argues, individuals can employ self-reflectiveness and self-regulation to mitigate the impacts of affect infusion and attribution errors. Through metacognitive activity, they judge the correctness of their predictive and operative thinking against the good or bad outcomes of their actions and thus manage the causes of conflict. If so, then by limiting self-serving attributions and affect intrusion in decision making through self-regulation, entrepreneurs can limit the negative impacts of strong emotion and conflict in decision making. Self-regulatory characteristics can also moderate the heuristics of optimistic overconfidence, the certainty effect and loss aversion, which create obstacles to conflict resolution (Kahneman & Tversky, 2000e). Furthermore, the intentional use of creative conflict can be used to overcome dysfunctional conflict and improve collaborative decision making (Eisenhardt et al., 1997). In summary, self-regulation appears to play a significant role in the cognitive errors that can arise out of strong emotion and other stressors in decision making, prompting the seventh exploratory proposition.

**Proposition 7**

***Entrepreneurs' self-regulatory characteristics influence the cognitive errors due to extreme bias in decision making.***

## DECISION SPEED

As discussed earlier in this chapter, heuristics are related to decision speed and rapid decision making in particular (Gigerenzer & Goldstein, 1996). With limited time, people must use cognitive shortcuts as heuristics in decision making. This has been a major topic of research in the area of naturalistic decision making, and especially decision making in stressful situations such as medical emergencies and military conflict (Hammond, 2000). These studies explore how people “in dynamic, uncertain and often fast-paced environments, identify and assess their situation, make decisions and take actions whose consequences are meaningful to them and to the larger organization in which they operate” (Zsombok, 1997:5). Gigerenzer (2002) has also shown that people use Fast and Frugal Heuristics to make speedy decisions in emergency situations, and often very effectively.

Decision speed has also been studied in relation to self-regulation. For example, in a series of empirical studies, Forster et al (2003) show that regulatory focus influences the speed and accuracy of decisions. One study showed that as participants move closer to the goal of completing the task, speed increases and accuracy decreases for participants with a promotion focus, whereas speed decreases and accuracy increases for participants with a prevention focus. Overall, their results show that speed/accuracy decisions are influenced by the strategic inclinations of participants varying in regulatory focus. In another set of studies based on regulatory focus theory, it was shown that the activation of a positive self-stereotypes induces the strategic approach motivation of a promotion focus, which in turn induces “a riskier, more explorative processing style that bolsters creativity and speed (in the service of maximizing hits) while diminishing analytic thinking and accuracy” (Seibt & Forster, 2004:5). With regard to self-efficacy, Wood (2000) has argued that those who feel self-efficacious in terms of information search will be more likely to seek out new

information in rapid decision making, while those with weak search self-efficacy will tend to rely on heuristics and readily available information. Although such behavior assumes the absence of significant time pressures and that relevant information is accessible, and those conditions often do not exist in entrepreneurial situations.

Indeed, many entrepreneurs operate in high-velocity environments where they must make fast decisions based on limited information. As a result, they often employ heuristic decision making and rely on other bases for judgment such as trust, debate and creative conflict (Brown & Eisenhardt, 1997; Talaulicar, Grundei, & Werder, 2005). Other scholars have argued that the use of heuristics, in particular, allows entrepreneurs to make the fast decisions required to compete in dynamic markets and quickly recognize new opportunities. “Their heuristic-based logic appears to give them a competitive advantage in quickly learning about new changes and what the implication of those changes are for the development of specific discoveries” (Alvarez & Busenitz, 2001:760). This discussion leads to the next proposition.

**Proposition 8**

***Entrepreneurs’ self-regulatory characteristics influence decision speed.***

**VALUES AND ETHICS IN DECISION MAKING**

All persons rely on values and ethical standards when setting goals and selecting the means to pursue them (Eccles & Wigfield, 2002; Higgins, 2000b). Values frame the nature of a person’s future goals, while ethics set the standard of right and acceptable means of goal pursuit. Values and ethics thus provide the general principles that guide goal setting and goal pursuit. As noted earlier, both goal setting and goal pursuit are deeply influenced by self-regulation (Carver & Scheier, 1998; Payne, Bettman, & Johnson, 1993).

In that sense, values and ethics are both inputs and outputs of self-regulated processes of decision making. This occurs in three ways: goal-setting, goal pursuit, and outcome evaluation. This mirrors the three major phases or stages of self-regulation that were discussed in Chapter 2 and depicted in the model of self-regulation and decision making in Figure 2 on page 58. I will now discuss each phase in turn as it relates to values and ethics.

### **Goal-Setting**

People decide to pursue goals that reflect their values. At the same time, goal setting is strongly influenced by self-regulatory factors, including promotion pride and self-efficacy. Firstly, if people act from promotion pride (or chronic promotion focus), they tend to adopt more positive attainment goals, take more risks, are driven by independent motivations, and act with a stronger sense of stronger purpose to attain ideal end-states (Grant & Higgins, 2003; Higgins et al., 2001). Those self-regulatory characteristics will incline them to adopt more positive and ambitious goals, ones that reflect more personal as opposed to communal outcomes. They will also be motivated to seek outcomes with a stronger purpose, such as self-realization or spiritual states.

Secondly, if someone acts with strong self-efficacy, they are imbued with self-confidence, commitment, and motivational strength. They will tend to set more ambitious, creative, and challenging goals which can deliver a strong sense of personal achievement motivation, while at the same seeking the collective good (Bandura, 2001). Consequently, the literature suggests that promotion pride and entrepreneurial self-efficacy will incline entrepreneurs to set goals that reflect the values of attaining positive gains, are personally challenging and creative, reflective of self-realization, and based on a sense of stronger purpose.

However, over-reliance on ideal values may result in over-commitment leading to bias and cognitive errors in decision making (Kahneman & Lovallo, 2000). Reliance on

ideals in decision making can also lead to excessive optimism and the concomitant underestimation of risk. Similarly, if people are strongly committed to ideal values, and then select goals based upon them, they will tend to perceive their subsequent decisions in a more favorable light irrespective of evidence to the contrary. Among entrepreneurs, this has been observed in relation to highly optimistic beliefs about personal goals and capabilities. Such ideals can foster an illusion of control and representativeness errors, that is, “where a conclusion is reached because it closely resembles the attributes of the information used for the decision” (Simon & Houghton, 1999:37). These beliefs can lead to over-confidence and an unrealistically strong sense of self-efficacy, especially among younger entrepreneurs who have not yet experienced many failures or setbacks (Forbes, 2005a). However, that is not inevitable. More self-reflective entrepreneurs with stronger self-regulatory characteristics should be realistic in both goal setting and goal pursuit (Bandura, 1997).

### **Goal Pursuit**

Once goals are set, people then make decisions to pursue those goals in ways that reflect their values and ethical standards. Moreover, the selection of goal pursuit means is influenced by self-regulation. For example, when acting from promotion pride, people tend to select eagerness decision means, take more risks, use scenario thinking, and seek to avoid errors of omission as opposed to errors of commission (Higgins et al., 2001). They will also tend to act from a more independent self-construal, inclining them to follow private ethical standards (Lee, Aaker, & Gardner, 2000). Yet at the same time, they may select decision means that correspond to a sense of stronger purpose and self-realization (Grant & Higgins, 2003). From that perspective, people may follow rigorous ethical standards for personal reasons, rather than from a sense of social compliance, vigilance, or seeking to avoid sanctions. A strong sense of self-efficacy will also influence the choice of

decision means from an ethical perspective. People will tend to feel more confident in their ability to be successful and achieve their goals, thus imparting a sense of ethical efficacy in the task domain (Vecchio, 2003). They will also be more persistent and committed to the decisions they make, helping them to engage with and resolve ethical conflicts and challenges (Krueger Jr & Dickson, 1994).

Ethical standards also play an important role in supporting adaptive and heuristic decision making in goal pursuit under pressure (Payne et al., 1993). In the absence of sufficient time and information, for example, people tend to rely on ethical standards to guide and validate short-cuts in decision making. That is true of entrepreneurs, who often find themselves in stressful situations. Thus, one could expect entrepreneurs to rely more heavily on ethical standards in goal pursuit. Indeed, this has been borne out in studies showing that entrepreneurs do rely on personal and professional ethics in making critical decision (Forbes, 1999). Similarly, entrepreneurs have been observed to make decisions based on assumed ethics about risk-taking, and on beliefs about their own purpose and life goals (Miner, 2000; Stewart et al., 1999). Social and cultural mores also play an important role by validating entrepreneurial decisions and by providing exemplars of heuristics and intuitions in critical decision making (Schoonhoven & Romanelli, 2001; Thornton, 1999).

### **Outcome Evaluation**

Goals having been set and pursued, people then evaluate their decision outcomes. In terms of values and ethics, people will typically assess whether goals were reached, their values maintained, and ethical standards upheld. These evaluation processes are influenced by self-regulatory factors as well. Regarding promotion focus, Higgins (2002) has shown that perceived decision outcome value is partly derived and reinforced by the degree of fit between decision means and the nature of the goal. Thus, if entrepreneurs pursue goals from a promotion focus with eagerness means, then they are more likely to attach positive

value to their decision outcomes. That is, they will have a sense of having made the right decision in the right way (Cesario et al., 2004). Such regulatory fit also translates into an affective response in decision making (Camacho, Higgins, & Luger, 2003). This in turn will reinforce a personal sense of promotion pride and pleasure in decision making, as well as strengthening their sense of entrepreneurial self-efficacy. In those ways, positive outcome values derived from regulatory fit will feed forward into the future self-regulation of decision making.

Self-efficacy also relates to decision outcome evaluation. Those with a strong sense of self-efficacy will tend to evaluate their achievements more intensely, and see them in more personal terms irrespective of success or failure (Bandura & Wood, 1989). Such evaluations then influence future goal setting and goal pursuit via feedback mechanisms (Bandura & Locke, 2003). Thus, self-efficacy will lead to more intense assessments of decision outcomes. Furthermore, if a goal is successfully reached, then a person will tend to evaluate that goal as more positive, and their decision means as more effective and correct. The resulting sense of self-satisfaction reinforces a person's sense of having pursued valuable goals using ethical means (Bandura, 1991; Markman & Baron, 2003). Thus, the literature implies that strong entrepreneurial self-efficacy combined with achievement success will be associated with intense feelings of personal success and right action. On the other hand, entrepreneurs who fail to achieve desired goals will tend to have more intense feelings of personal failure and mistaken action.

The literature suggests other ways in which value systems play a significant role in the self-regulation and decision making by entrepreneurs. Firstly, as noted above, self-confidence or self-efficacy influences an entrepreneur's approach towards risky decision making. Secondly, value-from-fit is partly determined by the perceived value of one's goals and ambitions, which in turn impacts upon the subsequent perception of prospects

(Kluger et al., 2004). Thirdly, some research has shown that task mastery related to the pursuit of self-chosen goals is related to personal values and self-appraisals, whereas task mastery related to imposed goals is more related towards external reward systems (Boekaerts & Corno, 2005). This suggests that entrepreneurs could be more likely to seek feelings of personal fulfillment and pride as outcome values in decision making. In summary, the self-regulatory characteristics of entrepreneurs should be related to the role of values and ethics in their decision making.

**Proposition 9**

***Entrepreneurs' self-regulatory characteristics influence the role of values and ethics in decision making.***

## **CONCLUSION**

This chapter has reviewed the literature on decision making by entrepreneurs. Firstly, it discussed the literature regarding the general role of self-regulation in decision making by entrepreneurs. Next, the chapter discussed the literature on the major decisions, decision styles and decision means that typify entrepreneurial decision making. Regarding the major decisions made by entrepreneurs, they were identified as the decision to adopt an entrepreneurial career, decisions about which opportunities to pursue and how to exploit them. The literature suggests that self-regulation should play a significant role in each of those processes, as instances of decision making about goal setting and goal pursuit.

The chapter then reviewed the literature on risky decision making, the use of heuristics by entrepreneurs and the contentious topic of heuristic bias. Self-regulation was considered in relation to each, and especially in relation to goal-directed thought and behavior. The chapter then discussed the relationship between self-regulation and decision



speed. Finally, the chapter discussed the literature on values and ethics in decision making by entrepreneurs. As a result, the chapter developed the following nine propositions.

**Proposition 1**

*Entrepreneurs' self-regulatory characteristics distinguish them from managers.*

**Proposition 2**

*Entrepreneurs' self-regulatory characteristics play a significant role in their decision making.*

**Proposition 3**

*Entrepreneurs' self-regulatory characteristics influence their decision making style.*

**Proposition 4**

*Entrepreneurs' self-regulatory characteristics influence the decision to adopt an entrepreneurial career.*

**Proposition 5**

*Entrepreneurs' self-regulatory characteristics influence risky decision making about opportunities.*

**Proposition 6**

*Entrepreneurs' self-regulatory characteristics influence the use of heuristics in decision making.*

**Proposition 7**

*Entrepreneurs' self-regulatory characteristics influence the cognitive errors due to extreme bias in decision making.*

**Proposition 8**

*Entrepreneurs' self-regulatory characteristics influence decision speed.*

**Proposition 9**

*Entrepreneurs' self-regulatory characteristics influence the role of values and ethics in decision making.*

The following chapters report and discuss an empirical investigation of those propositions. Chapter 4 will first explain the research methodology which underpinned the investigation.

## **CHAPTER 4:**

# **METHODOLOGY**

### **INTRODUCTION**

As noted earlier, this thesis is not seeking to test specific hypotheses. Rather, it is exploratory and seeks to extend knowledge and support the development of new theory about entrepreneurship based on borrowings from other fields of social science. The specific intention is to explore how pre-existing theories of self-regulation and decision making may illuminate the complexities of entrepreneurial cognition and decision making. Recent literature on these topics suggests that more qualitative and mixed methods studies could be promising ways to achieve that goal (Davidsson, 2005; Gartner & Birley, 2002b; Lyon et al., 2000; Zahra & Dess, 2001). This call for more varied methods of study is partly explained by the fact that the phenomena associated with human cognition within organizational contexts are highly complex and multidimensional. Research into these topics therefore calls for multiple data sources to identify patterns that may be otherwise difficult to predict and observe.

The topic of this thesis is similarly complex. It refers to three separate, although related literatures with their own trends and debates. Each literature poses significant issues for the study of entrepreneurs and entrepreneurship. In order to address those issues, the thesis adopts an appropriately pluralistic methodology, namely a mixed methods approach. The specific methods which are mixed in the thesis are semi-structured interviews and a survey questionnaire. I therefore employ both qualitative and quantitative data and analytic techniques. In the following sections of this chapter, I will explain and justify the chosen methodology in greater detail.

## METHODOLOGY AND ENTREPRENEURSHIP RESEARCH

Busenitz et al (2003) have identified a number of methodological weaknesses that are common in recent entrepreneurship research. Among their recommended corrections they suggest the inclusion of techniques that can reveal underlying cognitive structures and processes. This thesis seeks to meet that challenge by using pre-existing instruments to measure known self-regulatory construct variables, as well as by gathering qualitative data through in-depth semi-structured interviews.

One common technique used to investigate these underlying cognitive structures and processes has been to compare entrepreneurs with managers (Davidsson, Forthcoming). Indeed, this thesis does that as well. I define an entrepreneur as an individual who has been directly involved in founding and managing a new venture to exploit a growth opportunity, while I define a manager as an individual who has never been involved in founding and managing such a venture. Thus, for the purpose of this thesis, entrepreneurs are distinguished from managers in terms of the active foundation of a new venture to exploit an opportunity.

However, the comparison of individual entrepreneurs and managers entails methodological challenges. For example, some studies assume or imply that entrepreneurs and managers are both homogenous groups. Others argue that this assumption is unreliable and may shroud important within-group differences (Davidsson, 2005; Forbes, 1999; Sarasvathy, 2004a). The latter group of scholars argues that researchers should also explore intra-group similarities and differences among entrepreneurs, and thus investigate whether some entrepreneurs are more likely than others to exhibit distinctive distal and proximal psychological attributes. Only in that way, they argue, can comparative studies uncover the special features of entrepreneurial cognition and decision making.

This thesis adopts a compromise position regarding this issue. It does compare entrepreneurs with managers as distinct groups, in order to identify any major differences between them regarding their self-regulatory characteristics. However, the major focus of the thesis is to explore potential heterogeneity among entrepreneurs in terms of their self-regulatory characteristics and how those characteristics relate to their decision making behavior.

With respect to sampling, previous research into entrepreneurship has also been limited in terms of its approach and methodology. Firstly, some studies have tried to uncover features of entrepreneurship through easily obtained samples of business students studying at colleges and universities (e.g., Chen et al., 1998; Clarke & Aram, 1997; Sagie & Elizur, 1999). However, as Markman et al (2002) argued, the realities of founding and managing a new venture are very different from classroom simulations or hypothetical questions. They further argued that the multidimensional nature of actual entrepreneurial cognition and behavior can only be observed in operational contexts, that is, among actual entrepreneurs. That is one reason why the subjects recruited for this thesis are all practicing entrepreneurs and managers.

Other studies have used more convincing samples drawn from operational environments. For example, in a study of personality traits among entrepreneurs, Korunka et al (2003) drew from a large pool of over one thousand nascent entrepreneurs and new business owner-managers, giving their study strong validity and reliability. Similarly, Allinson et al (2000) used survey responses from over 150 high growth companies in their study of intuition among entrepreneurs. In another large study, Stewart et al (1999) compared entrepreneurs and managers within a broad situational context. They surveyed over 700 small business owner-managers and corporate managers in the USA, using a

multidimensional questionnaire composed of a number of pre-existing instruments to measure different cognitive and personality factors.

Yet even statistically robust studies are sometimes limited in terms of their dependent variables. Many studies sample on the dependent variable without adequate consideration of potential antecedents and consequents (Davidsson, 2005; Thornton, 1999). That is, some studies either assume or ignore the dynamic temporal contexts of entrepreneurial phenomena. This thesis also samples on the dependent variable, insofar as the entrepreneurs recruited for the study had already made the decision to become an entrepreneur and were actively pursuing opportunities. This feature of the thesis means that its findings cannot be used to make strong claims about the processes whereby people become entrepreneurs in the first instance, nor can it make strong claims about the psychosocial characteristics of nascent entrepreneurs. Nonetheless, for the purposes of conducting an exploratory study such as this thesis, sampling on the dependent variable can be a useful and even recommended approach (cf., Davidsson, Forthcoming).

In summary, having recognized the complexity and multidimensional nature of entrepreneurship, scholars have advocated more qualitative approaches which typically employ smaller samples. In particular, researchers into entrepreneurial cognition and decision making have argued that those processes require more detailed and contextual analysis (Busenitz et al., 2003; Sarasvathy, 2004a). In the same vein, Mitchell et al (2004) argued that the scholars of entrepreneurial cognition research must build and extend domain specific theories. They cannot simply replicate theories and constructs from other fields of inquiry and expect to justify, let alone explain, the special nature of entrepreneurial cognition. Rather, scholars must dig into the detail of this domain and seek to identify its special patterns and processes. The same can be said for studies of self-

regulation and decision making among entrepreneurs (Baron & Ward, 2004). The methodology chosen for this thesis reflects those recommendations.

## **PHILOSOPHICAL FOUNDATIONS**

Much of the literature discussed in Chapters 2 and 3 takes one of two broad approaches to the methodological challenges thrown up by pluralism and the search for synthesizing theories. Scholars either attempt to integrate divergent perspectives into new coherent theoretical frameworks, or they allow for differentiation and embrace inherent pluralism. In either case, the same scholars are increasingly sceptical about traditional philosophical and methodological positions based on the polarity between positivism and interpretivism (Pettigrew, 2001; Teddlie & Tashakkori, 2003). They also challenge the functionalist paradigm that dominated much social science research in the latter decades of the twentieth century (Gartner & Birley, 2002a; Grant & Perren, 2002).

Over recent years, therefore, the social science and business literature have seen an increasing number of studies employing hybrid methodologies that question the earlier paradigmatic divides (e.g. Dean & Sharfman, 1996; Earley & Mosakowski, 2000; Kuhn & Poole, 2000; Scandura & Williams, 2000; Snow & Thomas, 1994). For example, attempts to synthesize decision making and the environment question the subjective-objective polarity that is often viewed as a fundamental ontological division between positivistic and interpretivist approaches. Indeed, the supposed ontological incompatibility of psychological phenomena and environmental factors underpins the classical Bayesian ideal of rationality and its prejudice against psychological influences on decision making (Camerer & Loewenstein, 2004).

Similarly, theoretical pluralism which views entrepreneurial new ventures as dynamic, variable and emergent forms, necessarily limits the search for generalizability

and statistical significance across a whole population (Gartner, 2001). That is, the embrace of pluralism throws into doubt some of the explanatory norms that are widely regarded as fundamental distinctions between quantitative and qualitative methodologies (Brown & Eisenhardt, 1997; Child, 1997; Eisenhardt, 1989). For example, if a pluralistic view of decision making allows for systematic interaction between psychological factors such as intentionality and environmental factors such as resource availability, then that view must reject both the traditional positivist scepticism about the reality of psychological phenomena and the traditional interpretivist scepticism about objective reality. In fact, one of Sarasvathy's (2001) motivations for developing effectuation theory was to go beyond these traditional positions with respect to entrepreneurship.

For the same reason, many recent synthesizing approaches in the social sciences have adopted innovative theoretical models found in other disciplines, such as complexity theory, systems theory and evolutionary biology (see e.g. Bruner, 1996; Holland, 1998; Wilson, 1998). Some scholars of management have followed this lead, thereby supporting a widely held desire to reconfigure classical philosophical and methodological debates in the light of post-positivist and non-foundationalist theories of knowledge and science (Pettigrew, 2001). To date, however, there is no clear consensus on what should replace the classical positivist-interpretivist polarity. Instead, there is a plurality of synthesizing approaches within management studies and entrepreneurship. Nevertheless, there is a strong preference among many scholars for new approaches that can draw together theories and methodologies that have hitherto been regarded as incommensurable (Currall & Towler, 2003; Grant & Perren, 2002; Pettigrew, Thomas, & Whittington, 2002; Volberda & Elfring, 2001).

This thesis also rejects the classical polarity of positivism and interpretivism and adopts an alternative approach which supports multidimensionality, non-reductive



empirical explanation, an ideographic context for epistemology, a pragmatic approach to ontology, and an emergent approach to theory development (cf., Chomsky, 2000; Creswell, Clark, Gutmann, & Hanson, 2003; Hammond, 1996; Lincoln & Guba, 1985; Tashakkori & Teddlie, 2003b). These approaches best respond to the observed complexity and multidimensionality of phenomena in different fields and draw together different theories and methodologies. Therefore, in response to the complexity and multidimensionality of decision making by entrepreneurs, this thesis will be pragmatic and pluralistic in its conceptual underpinning, methods of data collection and analysis, and in the discussion of its results. By adopting these principles, this thesis falls into the broad category of naturalistic enquiry.

### **Naturalistic Enquiry**

The core question of naturalistic inquiry has been put thus: “to what extent can society be studied in the same way as nature?” (Bhaskar, 1979: 1). When framed in that way, the debate over naturalistic social science has a long history, including the ongoing debates surrounding the work of Darwin and Marx in the nineteenth centuries. However for much of the modern era, naturalism was broadly equated with positivism or the empiricism of classical physical science. In the more recent past, however, the debate has shifted. The study of biological and complex physical systems has led to a greater focus on emergent phenomena in nature and irreversible time-directional or “purposive” processes. Within this post-positivist paradigm, the classical tenets of positivism are often viewed as opposed to naturalism, rather than aligned with it (Lincoln & Guba, 1985; Prigogine, 1996). That is, the norms of classical natural science became entrenched as the philosophical paradigm of positivism, while more recent natural science and especially the biological sciences underpin post-positivist naturalism (Mayr, 1997; Wilson, 1998). Not surprisingly, some contemporary philosophers still debate these issues intensely (e.g.

Kornblith, 2002; Rea, 2002) and many social scientists appear equally concerned by these topics (Bhaskar, 1979; Hussey & Hussey, 1997).

Much of the debate about post-positivist inquiry in the social sciences is therefore framed within the context of traditional philosophical debates about truth, reality and the status of the observer – that is, questions of epistemology, ontology, perception and mind. However the debate is often polarized. On the one hand, some naïve naturalists create straw men who are portrayed as typical positivists, then attack their simplistic realism and reductionism. While on the other hand, defenders of classical positivism criticize naturalistic enquiry for its subjectivism, relativism and value dependence (Lincoln & Guba, 1985). In fact, it is arguable that both polarities are abstracted philosophical extremes that are largely unrelated to the practicalities and possibilities of more recent natural and social science. Other scholars take a more flexible and pragmatic approach to these foundational debates and are not driven by the desire for determinant philosophical positions (e.g., Chomsky, 2000; Ghoshal, 2005; Prigogine, 1996; Rynes & Gephart Jr., 2004; Teddlie & Tashakkori, 2003). I will adopt a similar approach, especially in regard to issues of trustworthiness.

Despite being broadly sympathetic to the naturalistic approach to inquiry, this thesis is not thereby committed to the position termed “naturalistic decision making” (Zsombok, 1997). Naturalistic decision making is a specific approach to decision making which largely rejects formal, structured decision theories developed by scholars such as March and Simon (Howell, 1997). This study, on the contrary, will follow an approach similar to those who explore structured decision making naturalistically within a cognitive framework (Hammond, 2000). From within this framework, cognitive phenomena are viewed as naturally occurring aspects of human experience and not as problematic reflections of an interpreted reality.

At the same time, this thesis assumes that cognitive phenomena may play a systematic role within human decision making processes. This overall approach can best be described as philosophically pragmatic, in that it assumes that the natural world consists of both physical and cognitive phenomena and is therefore ontologically heterogeneous. Given that metaphysical position, philosophical pragmatism accepts that coherent truth about the natural world can be discovered using pluralistic methods (Creswell, 2003). That is, some aspects of the natural world are susceptible to measurement using quantitative techniques, while other aspects of the same world are best explored using qualitative techniques. The mixed methods approach employed in this thesis exemplifies such methodological pluralism and its naturalistic underpinnings. Indeed, mixed methods are especially suited for the investigation of pluralistic and multi-level phenomena.

## **RESEARCH DESIGN**

Noting the situational and human complexities of entrepreneurship, scholars have called for more varied pluralistic methods to explore these phenomena (Davidsson et al., 2001; Gartner & Birley, 2002b). I responded to that call by choosing to conduct a mixed methods study that employed both qualitative and quantitative techniques, although the study is primarily qualitative. The major qualitative component consisted of semi-structured interviews with 30 entrepreneurs regarding their decision making. The quantitative component involved a survey that was administered to the same 30 entrepreneurs plus a group of 30 managers. It measured two pre-existing self-regulatory constructs known as regulatory pride and entrepreneurial self-efficacy. The data gathered using those two methods were intended to shed light on different facets or levels of the same process, namely decision making by entrepreneurs as a form of social cognitive lived experience (Sale, Lohfeld, & Brazil, 2002).

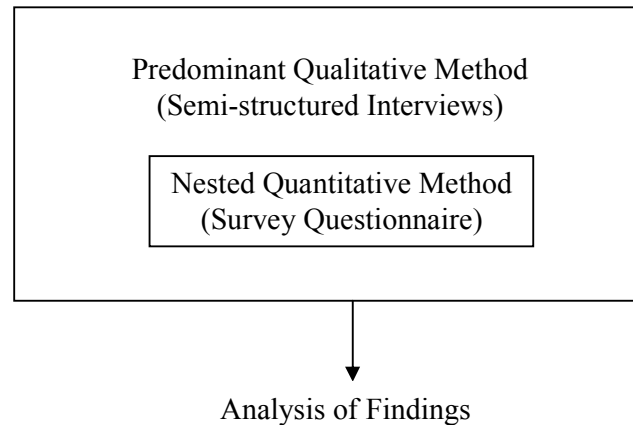
This thesis is therefore an example of a small sample study which aims to probe phenomena holistically and at greater depth (Eisenhardt, 1989). However, it is not a grounded theory study, which typically commence with broad propositions, approach the research site agnostically and seek to gather thick descriptions (Creswell, 1998; Strauss & Corbin, 1998). Rather, this thesis is a mixed method multiple case study, aiming to explore relatively narrow research questions using small samples that are purposively selected to focus on embedded process, that is, processes which occur within cases (Morse, 2003; Yin, 1994). In addition, the cases are purposively selected to exhibit the processes identified in the research questions. In summary, studies in social and business research may integrate both qualitative and quantitative methods as mixed methods, may explore relatively narrow propositions or questions, may include a relatively small sample of multiple cases that are purposively selected, and may study an embedded process within and across those cases (Babbie, 2001; Greenberg & Folger, 1988; Seale, 1999; Singleton & Straits, 1999). This thesis is an example of such a study.

### **Concurrent Nested Strategy**

There are varieties of mixed method strategies. In this thesis, I adopt what is termed the concurrent nested strategy (Creswell, 2003). It is termed concurrent because there is one data collection phase for both the qualitative and quantitative data. In this thesis, for example, I conducted semi-structured interviews with entrepreneurs followed almost immediately by a survey questionnaire to the same entrepreneurs and a group of managers. The strategy is described as nested because there is a predominant method that guides the overall project, and another method is then embedded or nested within the framework of the predominant method. In this thesis, the predominant method is qualitative and involves semi-structured interviews with the entrepreneurs, and the embedded or nested method involves the survey questionnaire with the entrepreneurs and managers. The overall design

of this thesis as a concurrent nested strategy is depicted in Figure 3, based on Creswell's (2003: 214) general model of such strategies.

**FIGURE 3**  
**Model of Thesis as Concurrent Nested Strategy**

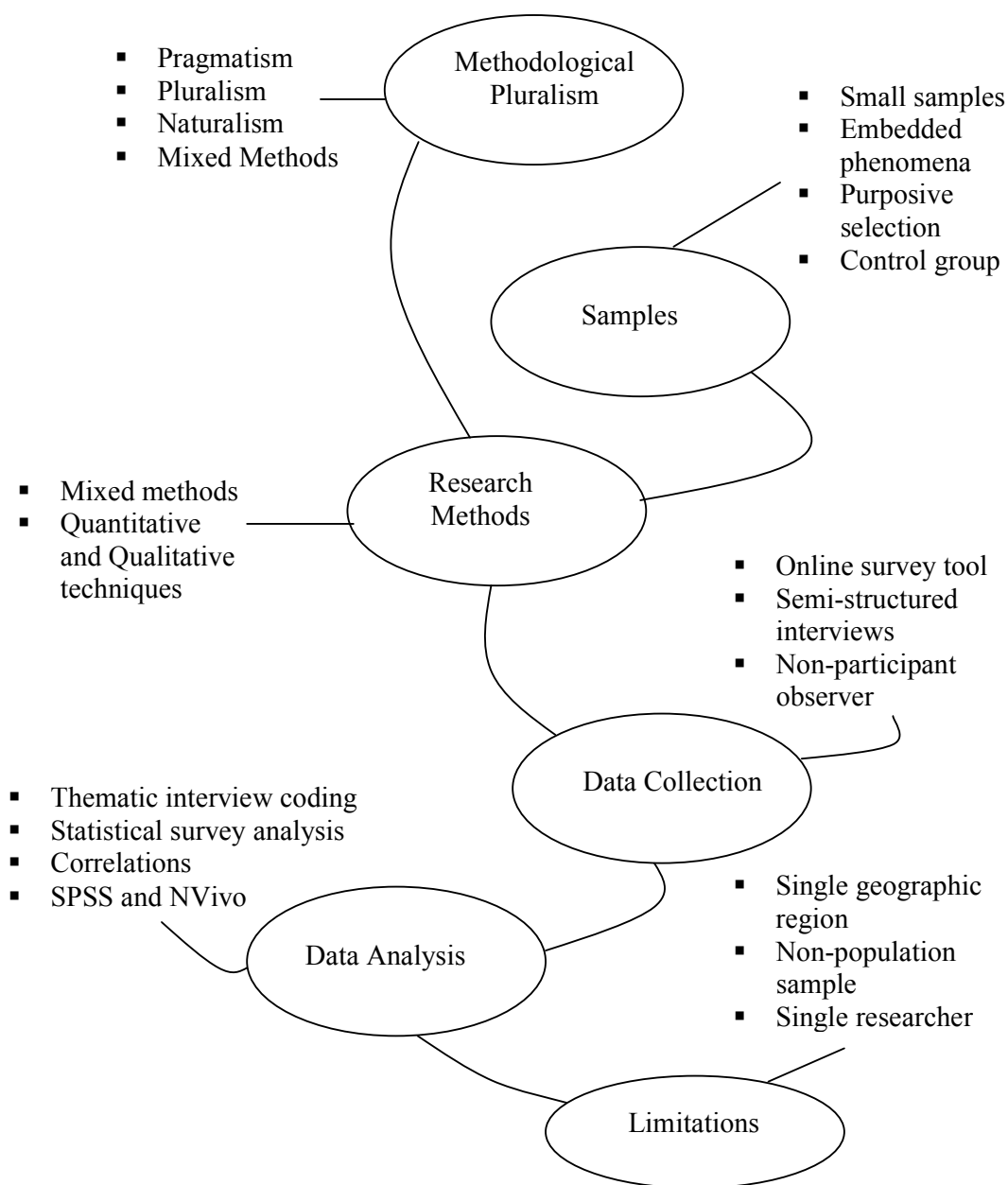


One major reason for adopting the concurrent nested strategy is to enable exploration of different levels or dimensions of the same process (Creswell et al., 2003). The data gathered using the nested method may explore one level or dimension of the process in question. That data is then typically transformed and combined during analysis with the data gathered using the predominant method which may focus on a different level or dimension of the same process. In this thesis, the nested method is a quantitative survey questionnaire which measures two pre-existing self-regulatory construct variables. The data derived from this survey are then transformed to derive a qualitative ranking of entrepreneurs regarding their self-regulatory characteristics. These transformed data are then combined with the interview data gathered using the predominant qualitative method. In that way, this thesis uses a concurrent nested strategy to explore different aspects of

decision making by entrepreneurs. The overall research design of this thesis is depicted in the model of methodology and methods in Figure 4.

**FIGURE 4**

**Model of Methodology and Methods**



### **Examples of Mixed and Multi Methods**

As noted in Chapter 1, some examples of multi- and mixed methods research have recently appeared in the *Academy of Management Journal*. For example, Boland et al (2001) reported a laboratory study of cognitive factors in decision making. Their sample consisted of 34 participants. They used both quantitative and qualitative techniques including statistical analysis of self-report survey items and thematic coding of qualitative data. Having analyzed the data using these techniques, the results were then used to test formal hypotheses.

Another example is provided by Maritan (2001), who conducted a field study of capital investments decisions by firms. The sample consisted of 29 investment decisions by Fortune 500 companies. The data were largely qualitative generated from interviews with decision makers. The data were analyzed using descriptive statistics and ANOVA tests. The results were used to generate a model of the decision making process regarding such capital investments. As in the first study cited above, the sample in this study was approximately 30, and the data analysis combined quantitative and qualitative techniques.

A third example of such research published in the *Academy of Management Journal* is an exploratory study by Mohrman et al (2001). Drawing from the literature on knowledge transfer and cognition, they developed a new general model of research that can be useful for practitioners. The authors developed formal hypotheses regarding this topic, then gathered interview and archival data from a sample of 10 companies over a three year period. The resulting textual data were analyzed using qualitative textual analysis, plus nonparametric quantitative techniques including Spearman correlations.

In other mixed method studies, multifaceted research approaches and multiple data gathering techniques have included survey questionnaires, interviews, plus participant observation (Snow & Thomas, 1994). Mixed methods studies are thus becoming

increasingly popular within social research where they are used to explore and identify the relations and interactions among psychological and strategic variables in real social structures (Bryman, 1988; Currall & Towler, 2003; Greenberg & Folger, 1988; Layder, 1993; Perry, 1998; Scandura & Williams, 2000). Similarly, this thesis will seek to uncover the role of self-regulation within entrepreneurial decision making.

### **SELECTION OF CASES**

As stated earlier, I adopted a pragmatic, pluralistic and naturalistic foundation for the thesis. This underpinned a naturalistic approach to sampling. As Lincoln and Guba (1985:202) explain, “Naturalistic sampling is, then, very different from conventional sampling. It is based on informational, not statistical, considerations. Its purpose is to maximize information, not facilitate generalization.” In the same way, the sample size is not determined by the number of instances required to make statistical generalizations, but rather by the natural range of the phenomena to be studied; “the criterion invoked to determine when to stop sampling is informational redundancy, not a statistical confidence level” (cf. Creswell et al., 2003; Lincoln & Guba, 1985:202).

From a naturalistic perspective, it is possible to adopt any of the recognized qualitative approaches to purposive sampling. They range from deviant case sampling, which focuses on cases that are rich in information because they are highly unusual, to the opposite approach of typical case sampling. Another approach seeks to gather a sample of great diversity or a maximum variation sample (Patton, 1990). That is the procedure adopted in this thesis. It aims to select groups of cases that represent the maximum range of variation for given populations, namely entrepreneurs and managers, while at the same time providing relatively homogeneous groups from both categories.



In other words, the samples are homogeneous in terms of being entrepreneurs or managers, yet potentially heterogeneous in terms of individuals' cognitive and behavioral characteristics. The data collected from such samples yield three kinds of findings. Firstly, the data provide high-quality, detailed descriptions which highlight uniqueness. Secondly, the data expose any important shared patterns that cut across cases (cf., Davidsson, 2005). Thirdly, the combination of interview and survey data can lead to the discovery of new associations between and within observed phenomena (Rynes & Gephart Jr., 2004).

### **Selection Criteria**

As noted earlier, the thesis defined “entrepreneur” as an individual who has been directly involved in founding and managing a new venture to exploit a growth opportunity. The 30 entrepreneurs recruited for this thesis 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 founders of new firms 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 early stage start-ups less than three years old, while a few were in post-start-up stage over eight years old (cf. Bhidé, 2000). All were based in or near Sydney, Australia. They represented a range of industry sectors including health and biotechnology (11 cases), information and communication technologies (14 cases), services (two cases) and retail (three cases). Because the sample was drawn from one national geographic region, key regulatory and environmental conditions were held constant, as well as some of the situational and environmental variables that may influence socio-cognitive self-regulation.

I also recruited a control group of 30 managers for the survey component of the thesis. They also possessed a range of ages, education levels, industry backgrounds and

levels of seniority within both small and large organizations. Twelve members of this group were senior executives and six were women. The aim of the selection technique was to identify a variety of entrepreneurs and managers that may exhibit a range of self-regulatory characteristics in relation to decision making behavior. In that sense, the sampling technique seeks to display pluralism and maximum variation.

### **Sampling Procedure**

Access to suitable entrepreneurs was made using my own personal and professional connections in the local industry. For example, I have very good relations with a large business incubator located in Sydney, Australia, that hosts approximately 30 high technology start-ups. Entrants typically possess growth ambitions in high-technology entrepreneurship and innovation. The management of this incubator agreed to assist in recruiting subjects for the thesis. I am also well known to members of the Australian Venture Capital Association (AVCAL), and most venture capital firms in Australia are members of this organization. In addition, I have been employed for a number of years with organizations that help to establish and fund new technology ventures. I used this collective network to recruit participants. The resulting sample of entrepreneur cases is summarized in Table 3.

**TABLE 3**  
**Summary of Entrepreneur Cases**

<b>Company Age Years</b>	<b>Industry Sector</b>	<b>Gender</b>	<b>Role Tenure Years</b>	<b>Highest Education</b>	<b>Personal Age Years</b>
(0-5) 43%	Biotech 37%	Female 23%	(< 1) 17%	High school 3%	(20-29) 3%
(6-10) 37%	ICT 47%	Male 77%	(1-2) 17%	Undergrad 27%	(30-39) 27%
(11-15) 10%	Services 7%		(3-5) 43%	Postgrad 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

### Control Group

As stated earlier, one major purpose of the thesis is to identify any distinctive self-regulatory patterns among entrepreneurs. Therefore, in order to strengthen that aspect of the thesis, I recruited a control group of managers who had never founded their own business. The intention was to recruit a group who shared the demographic characteristics of the entrepreneur study group, except they had never founded a venture. The control group was mainly recruited opportunistically, although two were introduced by other members of the group. Three were later eliminated when it was learnt that they had in fact founded their own businesses in the past. This left a usable control group of 30 managers. The final control group represented a range of ages, education levels, industry backgrounds and levels of seniority within both small and large organizations. Twelve members were senior executives with strategic decision making responsibility. Six members of the group were women. The same survey instrument was administered to this group. The resulting sample of manager cases is summarized in Table 4.

**TABLE 4**  
**Summary of Manager Cases**

<b>Company Employees</b>	<b>Industry Sector</b>	<b>Gender</b>	<b>Role Tenure Years</b>	<b>Highest Education</b>	<b>Personal Age Years</b>
(< 25) 23%	Biotech 37%	Female 23%	(< 1) 10%	High school 10%	(20-29) 0%
(< 100) 20%	ICT 27%	Male 77%	(1-2) 10%	Undergrad 17%	(30-39) 47%
(< 1000)20%	Finance 10%		(3-5) 50%	Postgrad 63%	(40-49) 30%
(> 999) 37%	Govt. 10%		(6-9) 7%	Other 10%	(50-59) 23%
	Other 6%		(> 9) 23%		(> 59) 0%

*N* = 30

## **DATA COLLECTION METHODS**

The thesis employs two different data collection methods: semi-structured interviews followed by a survey questionnaire. The use of such mixed methods enhances robustness, reduces the risk of report bias, and strengthens validity and reliability (Creswell et al., 2003). The following sections describe the stages of the data collection process.

### **Stage 1: Initial Contact**

The first stage of the research was an introductory email or letter and follow-up phone call to more than 30 entrepreneurs. This initial approach sought to achieve the following. I explained the purpose, intended outcomes, research process and especially policies relating to participant's rights and guarantees of confidentiality. I then sent each participating entrepreneur a formal consent letter outlining the rights and obligations of both the researcher and participant. A copy of this letter is attached as Appendix A. The outcome of this process was a purposive, non-population sample of 30 entrepreneurs from a range of new venture growth stages, industries and personal backgrounds, and who were willing to participate in the thesis. Once their consent was obtained, I arranged a private meeting with each entrepreneur in order to conduct a semi-structured interview and explain the survey questionnaire.

### **Stage 2: Interview**

Because I was exploring relatively discrete embedded decision making processes, I chose to conduct semi-structured interviews, rather than structured or open interviews which are more suited to theory testing or grounded theory approaches respectively (Creswell, 2003). That is, semi-structured interviews balance the degrees of focus and freedom in the design and conduct of qualitative data collection. They are best suited to situations where a mature body of theory surrounds the research questions, yet the detailed

nature of the process or phenomena in question remains to be explored (Patton, 1990). Having chosen this method, I then interviewed each participating entrepreneur. However, I did not interview the managers in the control group because they were used as a control for the survey component only. To avoid report bias, all the participating entrepreneurs and managers were told that the thesis was primarily about decision making and they were kept unaware that it was exploring the role of self-regulation in particular.

In conducting the interviews, I adopted a non-participant observer status and used a standard interview guide for each participant. A copy of the guide is included as Appendix B. Using the same interview guide resulted in a consistent structure across all the interviews. In addition, following best practice, I avoided the use of unplanned questions and personalized interjections as much as possible, thus ensuring that the interviews were free of observer bias and influence (Patton, 1990). Questions covered a range of decision making tasks including opportunity evaluation and exploitation, career choice and decision making under pressure. At the end of each interview, the interviewee was invited to talk openly about any related topic. Each interview lasted approximately one hour and most were conducted at the interviewee's private office. I used a digital voice recorder for each interview, having first gained the interviewee's permission to do so. At the completion of each interview, I then explained the survey questionnaire.

### **Stage 3: Survey questionnaire**

The survey questionnaire included three major sub-sections: (1) assessment of the interviewee's regulatory pride using the Regulatory Focus Questionnaire developed by Higgins (2001); (2) assessment of the interviewee's entrepreneurial self-efficacy using the Entrepreneurial Self-Efficacy Scale developed by Scherer (1989); and (3) questions regarding the interviewee's background, demographic, experience, current role and the history of their involvement in company. Each participating entrepreneur answered the

survey questionnaire and all members of the manager control group answered the same questionnaire.

The thesis therefore employed pre-existing instruments to measure the two self-regulatory constructs of regulatory pride and entrepreneurial self-efficacy. Firstly, regulatory pride occurs as two distinct construct variables known as promotion pride and prevention pride. As noted above, these constructs were measured using an instrument called the Regulatory Focus Questionnaire, which was developed in the USA and has been shown to have strong construct validity and reliability in a number of studies (Camacho et al., 2003; Grant & Higgins, 2003; Higgins et al., 2001). The instrument is included as Appendix C.

The Regulatory Focus Questionnaire measures an individual's chronic subjective history of success in terms of positive goal attainment (from a promotion focus) and failure avoidance (from a prevention focus). The instrument consists of 11 self-report questions using a five point Likert scale, relating to a person's perceived history of their behavior in relation to parental and non-parental contexts. Most of the questions are scored in terms of "never or seldom" to "very often." Six of the 11 items are used to derive a measure for chronic promotion focus which is also termed "promotion pride." The other five items are used to derive a measure for chronic prevention focus which is also termed "prevention pride." Some of the instrument items have negative factors, and these details are given in Appendix C. The two resulting construct measures – for promotion pride and prevention pride – are typically uncorrelated.

Secondly, entrepreneurial self-efficacy was measured using an instrument called the Entrepreneurial Self-Efficacy Scale (Scherer et al., 1989). The instrument is included as Appendix D. It has been shown to have high construct and content validity across a range of cultures and geographies. It consists of five self-report questions scored in terms

of “completely sure” to “completely unsure” on a seven point Likert scale. However, some scholars argue that a few aspects of the entrepreneurship task domain – such as risk taking and innovativeness – were not captured in this instrument and alternatives have since been developed (Boyd & Vozikis, 1994). For example, Chen, Greene, and Crick (1998) include risk-taking as a dimension of their revised entrepreneurial self-efficacy instrument. However, the inclusion of risk-taking in that way begs many unresolved questions about the nature of risk-taking as a distinguishing feature of entrepreneurship (cf. Palich & Bagby, 1995; Sarasvathy et al., 1998; Zahra & Dess, 2001). Therefore the instrument used in this study is more conservative in terms of the assumed core features of entrepreneurship.

Regarding the survey technique, the ethics committee of my research institution required that I provide both an online and paper version of the survey to each subject. This was to ensure confidence in guarantees of confidentiality and to avoid any response bias owing to the survey methods. Only two preferred the paper version and the rest completed the survey online via a secure online link using the survey site [www.surveymonkey.com](http://www.surveymonkey.com).

## **DATA ANALYSIS**

The two sets of data – one from the survey questionnaire, the other from the semi-structured interviews – were analyzed separately in the first instance. I will describe each stage of the analysis process in the following sections.

### **Survey Analysis**

The survey data were collected and entered into the computer application SPSS (2003). I applied pre-published factors to the data regarding regulatory pride and entrepreneurial self-efficacy. The reported survey scores are the factored scores divided by the number of related items in the instrument. These factors had been published by the

developers of the two instruments, being Higgins (2001) for the Regulatory Focus Questionnaire, and by Scherer (1989) for the Entrepreneurial Self-Efficacy Scale. The factors used for these instruments are given in Appendices C and D respectively. I chose to use pre-published factors because the small samples used in this thesis were not sufficient to derive new factors or to perform confirmatory factor analysis. The use of such pre-published factors limits the validity of the constructs measured using the instruments. However, these limitations are consistent with the fact that the results derived from analysis of the survey data are not used to support any general claims about populations.

I then tested the data from both the entrepreneur and manager samples for normality using pp-plots. As I will report in Chapter 5, these tests showed evidence of normality. The data were then analyzed using descriptive statistics and nonparametric correlations. I chose to use nonparametric tests because of the relatively small samples sizes and retention of outliers. For the same reasons, the results cannot and will not be used to draw conclusions about a wider population (Bazeley, 2003).

As I will report in Chapter 5, Spearman correlation tests showed evidence of an association between promotion pride and entrepreneurial self-efficacy among the entrepreneurs, but no such pattern was evident among the managers. This result concurs with the arguments and evidence in the literature that was reviewed in Chapters 2 and 3. Based upon that literature, and the survey results, I used the survey data to rank the 30 entrepreneurs into three groups of 10 in terms of their self-regulatory characteristics. That is, I transformed the quantitative data regarding promotion pride and entrepreneurial self-efficacy to derive a qualitative rank ordering of the entrepreneur sample. I ranked the interviews using two methods, both of which showed the same result.

The top tertile (third) of the group was ranked as showing relatively strong self-regulatory characteristics, the second tertile showed relatively moderate characteristics,



and the third tertile was ranked as having relatively weak self-regulatory characteristics. The self-regulatory ranking of each individual entrepreneur was subsequently combined with the qualitative data derived from the interview analysis for each individual. This procedure resulted in each interview being ranked as either relatively strong, moderate, or weak in terms of self-regulatory characteristics, defined as the combination of promotion pride and entrepreneurial self-efficacy. As noted earlier, this kind of transformative technique is a standard approach to data analysis in concurrent nested mixed methods studies (Creswell et al., 2003).

### **Interview Analysis**

As noted earlier, I recorded semi-structured interviews with each entrepreneur. All the interviews were fully transcribed by a professional transcription service under strict terms of confidentiality. Where the transcriber detected ambiguity or lack of clarity, the text was marked for later review by myself. After receiving the transcribed interviews, I listened to each recorded interview at least twice to check the accuracy of the transcription and to resolve any noted ambiguity. Overall, the transcribed interviews resulted in approximately 300 pages of single spaced text averaging 10 pages per interview.

Once I had checked and corrected each transcript, I then imported it into the computer application NVivo (2002). I also imported the memos and field notes I had separately taken during and after each interview. The memos had recorded my own impressions and interpretations at the time of the interviews. The field notes recorded the environmental and situational conditions and other observations made during the interviews. Using the NVivo application, I then coded each interview for themes, and related them to my memos and field notes, while both reading the transcripts and listening to the audio recordings. This allowed me to analyze both the content and style of the

interviews. For example, I was able to identify and note when an interviewee was pensive and paused, or when he or she became excited and spoke more assertively.

The coding process was iterative over a number of months as the interviews were gathered. The number of distinct codes also evolved and grew over time, which is typical of such analytic methods (Creswell, 1998). Firstly, I coded each of the interviews based on the specific questions on the interview guide. Secondly, I coded on aspects and issues related to the research questions about decision making and cognition, such as references to risk, opportunities, motivations, and explicit or implicit stressors such as time pressure. Thirdly, I coded references to keywords such as “entrepreneurship”, “gut feel” and “strategy.” I also coded the interviews based on the significant meanings which were conveyed by the interviewees themselves, such as references to spirituality and life plans. I also coded related themes such as self-assessment and self-reflectivity. In this fashion, the codes and themes evolved over time.

During this ongoing process, as the thematic coding progressed, I continued analyzing the interviews to identify patterns in the coding, and/or relationships between themes as evidenced by co-occurring codes. This was also done using code matrix intersections, proximity analysis, the analysis of keywords and cross-case comparisons. Once again, this is a standard approach to the analysis of qualitative data in mixed method studies (Teddlie & Tashakkori, 2003). However, I took care to maintain a consistent documented and disciplined approach to the data collection and analysis process in order to prevent the introduction of researcher bias.

Later, after all the interviews had been coded, I then organized the coded interviews into strong, moderate and weak self-regulatory groups, based on the relative rankings derived from the survey data. I discussed this raking method in the previous section. However, it is important to stress that this step of ordering the interviews into self-

regulatory groups was only done after all the interviews had been conducted and thematic coding had also been completed. To do otherwise could have resulted in coding bias. That is, prior knowledge of which self-regulatory group each new interview belonged to might have influenced my approach to thematic coding. Therefore it was important to delay grouping the interviews until all had been gathered and coded. Subsequently, after ranking the fully coded interviews into strong, moderate and weak self-regulatory groups in this way, I was then able to further interrogate the interview data and explore patterns and themes in relation to the strong, moderate and weak self-regulatory groupings.

## **ROBUSTNESS OF METHODOLOGY**

### **Internal Validity**

In simple terms, internal validity and credibility are both concerned with showing that the attributes and relations ascribed to objects of study are real and demonstrable. Internal validity is the term used within more traditional studies, while credibility has been used within post-positivist naturalistic inquiry (Lincoln & Guba, 1985). Internal validity in this thesis was strengthened through triangulation of data collection methods about overlapping phenomena. In addition, I used a number of referential methods including self-reports by subjects, research notes during interviews and tapes of interviews. This form of triangulation has been recommended by the leading scholars of mixed methods research (Creswell et al., 2003).

The two self-regulatory construct variables measured are entrepreneurial self-efficacy and regulatory pride. They are conceived as related construct variables within the entrepreneurial decision making processes. The thesis used two pre-existing instruments, one to measure each. Both have been shown to be reliable and valid in earlier studies (Grant & Higgins, 2003; Scherer et al., 1989). Prior use of these instruments also provides

an objective basis for comparative measurement. However I do not assume a strict, essentialist typology for the functioning of those cognitive constructs. Indeed, too many studies have attempted narrow categorization of cognitive styles, whereas most natural occurrences of decision making exhibit complex and various patterns of cognition. That is, essentialist models over-simplify the realities of decision making and especially the operation of cognitive constructs in relation to within-problem reasoning. Therefore the categorization of cognitive styles based on simple aggregations from quantitative analysis must be replaced by models that incorporate qualitative differences in cognitive strategies, integrating both emic and etic approaches and mapping onto more than one cognitive style (Hong & Chiu, 2001; Lohman & Bosma, 2002). If that is correct, then construct validity cannot be based on a single dimension or a single method of analysis. It will require a multifaceted and mixed methods approach, similar to that adopted in this study and typical of naturalistic inquiries.

### **External Validity**

The concept of external validity refers to the criteria by which the attributes and relations of a subject variable can be applied to other like individuals or a population of such individuals (Lincoln & Guba, 1985). This thesis strengthens external validity by using purposive samples with wide variation on key demographic and situational variables, thus supporting the argument that the attributes of subjects may apply to other members of wider populations. In addition, the environmental context for the participants was held relatively constant due to the selection criteria. In taking this approach, I adopted neither naïve realism, which demands the independent reality of constructs, nor a post-modern view which asserts that constructs have no ontological status. To do either would be to endorse the excessively polarized approach to science described earlier.

### **Reliability**

The concept of reliability refers to criteria for consistent application or repetition of the thesis in other contexts. In this study, reliability was strengthened by using pre-existing survey instruments and methods, adopting a systematic approach to research design, and clearly documenting and reporting the research process (Lincoln & Guba, 1985; Tashakkori & Teddlie, 2003b). Reliability and consistency are limited, however, owing to the relatively small number of cases and because the thesis has a fairly narrow focus. Nor does the thesis explore all the potential variables that might influence self-regulation and decision making within the group of subjects.

### **Neutrality and Objectivity**

Many uses of the term “objectivity” are interpreted as quasi-metaphysical. That is, objectivity can imply a particular status for the human observer and the observed subject as independent entities and that reality is dualistic and mind is somehow separate from nature itself. To avoid this implication, naturalistic inquiry uses the concept of neutrality instead. It addresses the question of observer status, report bias and observer effects. In this study, I adopted a similar approach and tried to ensure objectivity or neutrality by adopting best practice research procedures. They include triangulating methods for a sample of subjects, maintaining a detailed personal research journal, using consistent interview and survey processes, documenting clear formal participation agreements with subjects, and following a transparent approach to the field study including consistent entry and exit protocols (Yin, 1994).

## **LIMITATIONS OF THE THESIS**

Because most of the data were gathered from entrepreneurs and managers based in one geographic region, the results are limited in applicability to different markets and

cultures. In Silicon Valley, for example, entrepreneurs may have easier access to the results of high technology research and development, venture capital investment, personnel who are highly experienced in product innovation and early adopter customers. Individual national cultures also have particular attributes that can influence organisational design, social cognitive behavior and decision making (Kreiser, Marino, & Weaver, 2002; Morris et al., 1998; Podolny, Morris, & Ariel, 1998). Studies suggest that cultural and socio-economic factors are especially relevant with respect to entrepreneurial activity (Wennekers et al., 2005). Yet despite that limitation, the results of studies performed in particular regions such as Silicon Valley are often extrapolated to other places and cultures. In that respect, this thesis shares the limitations and benefits of other studies.

In addition, this thesis investigates relatively small numbers of purposively selected cases as non-population samples. Thus, while the thesis may uncover patterns of association between variables within a particular group of entrepreneurs, the thesis cannot purport to make statistically based conclusions about wider populations. Rather, the thesis will suggest new theoretical constructs and practical applications that will require further validation with larger and more representative samples.

Another limitation relates to the composition and use of the control group. It is also a relatively small sample ( $N = 30$ ) includes a range of managers with different levels of responsibility. Some were junior managers with operational roles, others senior with strategic responsibilities. However, some studies suggest that senior executive managers may be more similar to entrepreneurs and less similar to junior managers who do not have strategic management responsibilities (Allinson et al., 2000; Busenitz & Barney, 1997; Sadler-Smith, 2004). Thus, a pattern of self-regulation that was observed among entrepreneurs may also occur among senior executives, yet be absent among junior

managers. If that is shown to be the case, it would suggest additional similarities between entrepreneurs and senior executives that are not explored by this thesis.

A further limitation of the thesis is that it employs only two pre-existing constructs borrowed from theories of self-regulation and omits others. A general study of the phenomenon would ideally explore theories and measures of self-regulation more broadly, although this is currently hampered by the general lack of integrated models of self-regulation (Zeidner et al., 2000). In addition, there are a number of instruments used to test entrepreneurial self-efficacy and none has yet received universal endorsement (cf. Chen et al., 1998).

Finally, the data are derived from self-reports using surveys and semi-structured interviews. The thesis seeks to mitigate the inherent limitations of such data by asking questions which do not focus on historical recollection, however that is only a partial mitigation of the inherent limitations of self-report data. The data is also gathered from the same subjects, thus raising the issue of potential common method bias. Once again, the thesis cannot avoid this limitation. In any case, the thesis is exploratory in nature, and does not seek to derive strong statistically based conclusions or make generalized claims about a population. In fact, it could be more likely that the results of the thesis are under-estimated by the use of such methods (Davidsson, Forthcoming).

## **ROLE OF THE RESEARCHER**

### **Mitigating Researcher Bias**

In terms of overall research design, potential researcher bias was partly mitigated through use of different data collection methods. The survey questionnaire employed pre-existing instruments that have already been shown to be valid and reliable in previous studies. With respect to the semi-structured interviews that were also conducted, the

researcher adopted a non-participant observer role, employed a consistent interview guide throughout all the interviews. I taped the interviews to ensure full data capture and adopted the same approach, entry and exit protocols for each subject. In addition, I staged the analysis of the data, so that interview coding in particular was performed prior to the ordering of interviews into high, moderate or weak self-regulatory categories. This was done to avoid coding bias based on my prior knowledge of the level of self-regulatory skill possessed by each entrepreneur.

### **Ethical Considerations**

The thesis was formally approved by the Ethics Board of Macquarie University prior to any data collection activity. The Ethics Board imposed a number of conditions on the research. In relation to the survey questionnaire, I was required to offer both an online and paper option to each entrepreneur. This was to meet any concerns that participants might have about the security of online survey tools. However, the survey for the manager control group was only administered online because that version of the survey gathered no personally identifying information. The version of the survey provided to managers also gave a full description of the research at the start of the questions and participants were asked to accept the terms and conditions of the research prior to completing the survey.

The Ethics Board also imposes strict guidelines on the storage and security of data gathered from human subjects. The names and affiliations of participants will not be disclosed, except to my advisor and the Ethics Boards itself. Consequently, the data gathered have been and will be kept strictly confidential and secure. However the nature of the data and the methods of collection pose a low risk and there is little chance of any personal or social harm for any of the participants. To date, no harm has been reported or detected.



## CONCLUSION

This chapter commenced by contextualizing entrepreneurship research within turbulent, dynamic and uncertain environments. The natural features of decision making processes within such environments are equally dynamic. Partly as a consequence, theories of such phenomena are increasingly pluralistic and multidimensional. Observed reality defies one-dimensional analysis and modeling. For the same reasons, studies of such phenomena must also adopt more pluralistic methodologies and methods. In this study, therefore, I adopt a mixed methods approach borrowing heavily from recent work in relevant areas of social science research. Such methods are increasingly common and coherent within post-positivist studies that aim to explore the detailed nature of complex cognitive processes. The mixed methods approach also strengthens the study's methodological robustness or trustworthiness.

Yet this thesis is limited like all empirical studies. This chapter explained that the samples of entrepreneurs and managers were relatively small and purposively selected to represent maximum intra-group variation within the constraints of homogeneity. At the same time, the data were gathered using self-report techniques, which further limits the generalizability of any findings. The thesis will therefore not make any statistically based claims about populations. Rather, the thesis seeks to explore the processes of decision making by entrepreneurs in relation to self-regulatory factors, and thereby contribute to the development of better explanatory theories about such phenomena. In the next chapter, I report the results of this exploration.

## **CHAPTER 5:**

### **RESULTS**

#### **INTRODUCTION**

There are two sets of results from this thesis. The first is based on analysis of data gathered from the survey questionnaire as a nested quantitative method. This survey was administered to all members of the entrepreneur and manager groups. I used descriptive statistics and nonparametric tests to analyze these data. The analysis sought to identify any patterns or associations of personal factors and self-regulation within and between the entrepreneur and manager groups.

The second and more substantial set of results is based on the data gathered from the semi-structured interviews as the predominant qualitative method. These interviews were conducted with the entrepreneurs about their decision making. The data were analyzed using thematic coding and cross-case analysis to identify patterns of themes based on co-occurring codes and keywords. The analysis sought to identify associations between personal factors and aspects of decision making by entrepreneurs in both general and specific decision situations.

The structure of this chapter is based on the different stages of analysis described above. The first section contains the analysis of the survey data, including the process whereby these data are transformed and combined with the interview data. The second section of this chapter then reports the results derived from further analysis of the combined survey and interview data. The analysis generates findings in the following areas of decision making: decision styles, career choice, opportunity risk, the use of heuristics, the management of heuristic bias, decision speed and the role of values and ethics.

## SURVEY RESULTS

As discussed in the preceding chapter, to comply with institutional ethics requirements, survey respondents were offered both an online and paper response method. All but two chose to use the electronic version of the survey instrument. Largely owing to this overwhelming use of the online version, the non-response rate was very low and all questions were answered correctly and completely by those who agreed to participate.

Once collected, the survey data were entered into the statistical analysis computer application SPSS. The data were first tested to determine their degree of normalcy. PP-plots showed normal distribution for all self-regulatory construct variables in both the entrepreneur and manager groups. The results of the pp-plots for the entrepreneur data are included in Appendix E, and those for the manager data are included in Appendix F. 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). Based on these tests, the data appeared normal. However, owing to the small sample sizes and the retention of outliers, I then conducted nonparametric rather than parametric tests.

Firstly, I used the nonparametric equivalent of independent sample t-tests to compare median values between the entrepreneur and manager data. The most robust test of this kind is the Mann-Whitney test of significance, which assumes non-normal data (Wild & Seber, 2000). These tests included the following variables: gender, age, educational level, length of tenure in their current role, industry sector, plus the construct variables of promotion pride, prevention pride, and entrepreneurial self-efficacy. The results showed no significant difference between entrepreneurs and managers for any of these variables ( $p$ 's > 0.11).

This result is somewhat surprising regarding promotion pride, prevention pride, and entrepreneurial self-efficacy. That is because the literature suggests that entrepreneurs and managers might differ in terms of these self-regulatory factors. I will discuss the implications of this finding in Chapter 6. It is also notable that, as in other studies of similar self-regulatory construct variables, gender and age were not significant factors and therefore they are not discussed further (cf., Forbes, 2005b; Grant & Higgins, 2003; Higgins et al., 2001).

I then tested the internal reliability of the construct variables of promotion pride, prevention pride and entrepreneurial self-efficacy, for both the entrepreneur and control groups. In this test, I relied on the normalcy of the data shown by the pp-plots discussed above. The results were borderline significant. The internal reliability tests for the construct variables among the entrepreneurs were promotion pride ( $\alpha = 0.63$ ), prevention pride ( $\alpha = 0.79$ ), entrepreneurial self-efficacy ( $\alpha = 0.68$ ). The internal reliability results for the construct variables among the manager control were promotion pride ( $\alpha = 0.67$ ), prevention pride ( $\alpha = 0.75$ ), entrepreneurial self-efficacy ( $\alpha = 0.65$ ). While Cronbach's alpha is not in itself sufficient to demonstrate internal consistency and construct validity (Davidsson, 2005), the results reported here agree with those of other studies (cf. Higgins et al., 2001; Scherer et al., 1989).

### **Descriptive Statistics and Correlations**

I then generated descriptive statistics and nonparametric correlations to identify any potential patterns of difference or association among the self-regulatory construct variables for both groups. I used nonparametric Spearman correlation tests which are highly robust and assume non-normal data (Kinnear & Gray, 2004). Table 5 shows the descriptive statistics and Spearman correlations for the entrepreneur group, and Table 6 shows the descriptive statistics and Spearman correlations for the manager group.

**TABLE 5****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

**TABLE 6****Means, Standard Deviations and Correlations for Managers**

<b>Variable</b>	<b>M</b>	<b>S.D.</b>	<b>1</b>	<b>2</b>
1. Promotion Pride	2.27	0.35		
2. Prevention Pride	2.14	0.56	0.20	
3. Entrepreneurial Self-efficacy	3.77	0.56	0.09	0.05

$N = 30$ ; All effects are two-tailed tests

Correlations are Spearman correlations

The mean values suggested that both the entrepreneur and control groups possessed stronger promotion pride than prevention pride. However, prevention pride appeared to be weaker among entrepreneurs than managers. This result offers some support for those who argue that entrepreneurs typically possess a stronger promotion orientation (Brockner et al., 2004). In addition, entrepreneurial self-efficacy was somewhat stronger among entrepreneurs, offering some support for the argument that entrepreneurial self-efficacy distinguishes entrepreneurs from managers (cf. Chen et al., 1998; Markman et al., 2002). However, it must be noted that the Mann-Whitney tests cited earlier showed that these differences were not statistically significant, and therefore I do not intend to make any stronger inferences based on these results.

With regard to the significance of each self-regulatory construct as a component of self-regulation among entrepreneurs, the correlations reported in Table 5 suggest that among entrepreneurs, promotion pride is 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 among entrepreneurs was also moderately significant ( $\alpha = 0.66$ ). Notably, there was no evidence of an equivalent association between promotion pride and entrepreneurial self-efficacy among managers. Finally, as in other studies of regulatory pride, promotion pride was not significantly correlated with prevention pride (Grant & Higgins, 2003).

In summary, there was some evidence to suggest that promotion pride and entrepreneurial self-efficacy are associated among entrepreneurs but not among managers. In addition, the results suggested that entrepreneurs have lower prevention pride than managers. Overall, however, the results suggest that entrepreneurs are not significantly different from managers in terms of regulatory pride and entrepreneurial self-efficacy.

### **Entrepreneurial Self-Regulation Ranking**

As I explained earlier, the main purpose of the survey component of the thesis was to identify and measure regulatory pride and entrepreneurial self-efficacy as important self-regulatory characteristics of entrepreneurs. That is, the purpose of the survey component was not to test formal hypotheses about the potential relationships between these constructs and other independent and dependent variables. Rather, the survey data were intended to enhance the data gathered using interview techniques by providing a qualitative assessment of the participant entrepreneurs' self-regulatory characteristics.

In that regard, analysis of the survey data suggested an association between promotion pride and entrepreneurial self-efficacy among the entrepreneurs, and also suggested that promotion pride is stronger than prevention pride among the same group.

These results also conform with the theoretical arguments and empirical findings in the literature that was reviewed in Chapters 2 and 3 (e.g., Baron, 2004a; Brockner & Higgins, 2001; Brockner et al., 2004; Forbes, 2005b; McMullen, 2003).

Based upon the results derived from the survey data, and noting the supporting arguments and 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 first ordered the entrepreneurs in terms of both construct variables. For each construct, I divided the 30 entrepreneurs into three sub-groups of 10 members each, thereby ordering the sample according to scores for both promotion pride and entrepreneurial self-efficacy. This resulted in 10 entrepreneurs in the lowest tertiles for each construct variable, 10 in the second tertiles, and 10 in the top tertiles. The derivation of these rankings is an example of data transformation within a concurrent nested mixed methods strategy (Creswell, 2003), where results from quantitative methods can be incorporated into the results derived from a study's predominant qualitative methods.

To confirm and support the ranking of entrepreneurs, I then calculated a second ranking using a different method. I re-calculated the scores for both construct variables, assuming the highest score for each was equal to 1.00. The revised scores for promotion pride and entrepreneurial self-efficacy were then added together for each entrepreneur, resulting in a combined score with a highest possible value of 2.00. I then ordered the 30 entrepreneurs based on these scores and compared the results to those derived using the first method. Inspection of the results showed that both methods generated very similar ranking outcomes in terms of promotion pride and entrepreneurial self-efficacy, the combination of which I shall refer to as "entrepreneurial-regulation." I then categorized the entrepreneurs into three groups of 10 members each having strong, moderate or weak entrepreneurial-regulation. The ranking results for these groups are depicted in Table 7.

TABLE 7

**Entrepreneurial Regulation Groups**

<b>Entrepreneurial Regulation Group</b>	<b>Case ID</b>	<b>Promotion Pride Tertile Rank</b>	<b>Entrepreneurial Self-Efficacy Tertile Rank</b>	<b>Combined Scores</b>
Weak	E29	1	1	1.16
Weak	E25	1	1	1.16
Weak	E01	1	1	1.23
Weak	E06	1	1	1.40
Weak	E28	1	1	1.41
Weak	E20	1	1	1.45
Weak	E19	2	1	1.45
Weak	E07	1	2	1.47
Weak	E17	2	1	1.50
Weak	E04	1	2	1.51
Moderate	E21	1	2	1.53
Moderate	E05	1	2	1.56
Moderate	E09	3	1	1.61
Moderate	E02	2	2	1.62
Moderate	E15	2	3	1.64
Moderate	E10	2	2	1.67
Moderate	E22	2	3	1.70
Moderate	E23	3	1	1.71
Moderate	E12	2	2	1.72
Moderate	E08	3	2	1.76
Strong	E13	3	2	1.76
Strong	E14	2	3	1.77
Strong	E16	3	2	1.79
Strong	E03	2	3	1.80
Strong	E24	3	3	1.81
Strong	E30	3	3	1.82
Strong	E18	3	3	1.83
Strong	E11	3	3	1.87
Strong	E27	2	3	1.89
Strong	E26	3	3	1.93

Further details of each case and its ranking are in given in Appendix G, which shows the rank for each entrepreneur as well as their gender, age, role and tenure, level of formal education and industry sector. From this point forward, I will refer to these three separate



groups as the strong, moderate and weak entrepreneurial-regulation groups. These groups thus rank the entrepreneurs who participated in this study in terms of their relative strength for promotion pride and entrepreneurial self-efficacy.

However, the creation of these groups neither assumes nor implies a significant statistical or causal relationship between the two construct variables. Rather, the three groups reflect the evidence gleaned from the survey analysis and the literature which suggests that both variables are important in entrepreneurial cognition and decision making, and that those who possess relatively strong versions of both may behave differently from those with relatively weak versions. In that respect, the entrepreneurial-regulation groupings are an exploratory device which allows the interview data to be interrogated in terms of the interviewee's relative self-regulatory characteristics. Thus, entrepreneurial-regulation is intended as an additional qualitative attribute, not as a new construct as such.

However, it must be stressed that the entrepreneurial-regulation rankings only reflect an intra-group comparison among the 30 entrepreneurs who participated in the study. The purpose of the ranking is therefore to highlight distinctions between members of the entrepreneur sample used in this study. The rankings do not imply a general pattern or measure of strong, moderate and weak self-regulation that might occur in other samples.

## **INTERVIEW RESULTS**

The interview transcripts totaled approximately three hundred pages of single spaced text. Firstly, I uploaded them into the computer application NVivo (2002) indexed by interviewee and question number. Next, I coded each interview for recurrent themes. This process was iterative over a number of months as interviews were conducted. The cumulative analysis resulted in approximately 80 separate codes. They included codes

about risk, career choice, opportunity evaluation, time pressure, personal history and self-evaluation. The 80 codes were then grouped into 14 thematic trees. These thematic trees included entrepreneurial decisions, situational stressors, heuristics, emotion, personal factors, decision speed and markets. I then performed cross-case analysis of the interviews using matrix intersections, proximate code analysis, and keywords.

After the initial survey and interview analysis was completed, both sets of results were combined to generate additional results. That is, the results of the survey analysis had been transformed to derive a ranking of the entrepreneurs based on their scores for promotion pride and entrepreneurial self-efficacy. These rankings were now used to group the coded interviews into strong, moderate and weak entrepreneurial-regulation groups, with each group containing 10 interviews. As noted earlier, this kind of transformation and combination of data during analysis is typical of concurrent nested mixed method studies (Creswell et al., 2003; Tashakkori & Teddlie, 2003a). Throughout the remainder of the thesis, the three entrepreneurial-regulation groups will sometimes be referred to simply as “groups” where the context is unambiguous.

Having grouped the interviews according to their entrepreneurial-regulation rank, the interview data were further analyzed to identify additional patterns and associations between and among codes, and especially to determine if any aspects of decision making varied relative to entrepreneurial-regulation. This process of analysis identified significant patterns of self-regulation relating to 25 of the 80 thematic codes. The analysis suggested that entrepreneurs did indeed vary in terms of their decision making behavior, depending on their entrepreneurial-regulation grouping. Differences were especially notable in the following areas of decision making: decision styles, career choice, opportunity risk, the use of heuristics, the management of heuristic bias, decision speed and the role of values and ethics. The following sections explain the findings in each of those areas.

## DECISION STYLES

Analysis of the interview data showed that entrepreneurial-regulation was related to the use of decision styles. In particular, the stronger the group, the greater the use of intuitive decision means, where intuitive decision means were indicated by coding references such as gut feel, trusting one's instincts, making judgments based on prior experience, and the reliance of exemplary information as opposed to detailed information search and analysis. In contrast, all three groups displayed very similar use of systematic decision means, which were indicated by references to structured information search and analysis, formal planning and systematic risk assessment. The overall results are given in Table 8, which shows the number of coded interviews and coding references for each of the entrepreneurial-regulation groups in relation to decision styles.

**TABLE 8**  
**Entrepreneurial-Regulation and Decision Styles**

Decision Style	Entrepreneurial-Regulation Group					
	Strong	(10)	Moderate	(10)	Weak	(10)
Intuitive	65	(10)	55	(10)	46	(9)
Systematic	45	(10)	40	(9)	46	(10)

Un-bracketed figures are the number of coding references  
Bracketed figures are the number of interviews coded

Overall, therefore, the results suggest that entrepreneurial-regulation is positively related to the use of intuitive decision means, although that does not entail a negative relation to the use of systematic decision means. More detailed analysis of the data identified additional patterns in the use of decision styles. Notably, both the intuitive and systematic styles were employed by all three groups with equal frequency in relation to

opportunity evaluation and exploitation. The same was true for the decision styles used in relation to risky decision making and the use of heuristics. These results are somewhat surprising, given that the literature suggests that intuitive and heuristic decision making about opportunities might be more common among those with stronger entrepreneurial-regulation (see Bandura, 1997; Higgins et al., 2001).

However, additional analysis of the data showed that these results were contingent on the nature of the opportunities themselves. As I will discuss later in relation to risk taking, those in the strong group tended to identify and embrace more challenging and risky opportunities. Thus, the notable aspect of the results shown in Table 8 is the fact that those in the strong group did not rely more heavily on systematic decision means in relation to more risky opportunities. Instead, further analysis of statements in the interview data suggested that members of the strong group continued to rely on intuitive decision means even in risky situations, whereas those in the weaker groups relied more heavily on systematic decision means in risky situations. Exemplifying this approach, one member of the strong group said, *“You can put all the numbers together you want about a particular decision, but at the end of the day you have to have a feeling yourself that like it’s going to work or the chances are good. And so it often relies on intuitive, gut feel, judgment.”* That is, he would gather data and analyze it systematically, but then still rely heavily on intuitive judgments in the face of uncertainty and risk. Few members of the moderate and weak groups spoke in this fashion.

More explicit differences between the groups emerged in relation to values and ethics and decision style. As I will report later in this chapter, members of the strong entrepreneurial-regulation group often referred to values and ethical standards in decision making, but very few members of the moderate and weak groups did so. Importantly, whenever participants did refer to values and ethics, they often discussed them in terms of

intuitive decision means. For example, one member of the strong group said that she incorporated intuitions at the level of values into her decision making: *“I suppose I don’t have to really think about integrity, I certainly don’t have to think about honesty.”* These results broadly conform with the entrepreneurship literature, where intuitive decision means are associated with the use of values and ethical standards in decision making (Hannafey, 2003; Sarasvathy, 2002).

In summary, therefore, the results suggest that the stronger the entrepreneurial-regulation group, the greater the use of intuitive decision means. This trend appeared most explicitly in relation to value judgments and ethical decisions, although it was also observable in relation to other areas of decision making such as career choice, partnering negotiations and the management of decision making under stress. Notably, however, the observed equivalence of both systematic and intuitive decision styles in relation to opportunity evaluation and exploitation was found to be contingent on the nature of the opportunities themselves, further highlighting the importance of considering within-group heterogeneity and situational contingency in the individual-opportunity decision making process (cf. Shane, 2003).

## **CAREER CHOICE**

Analysis of the interviews also uncovered significant results in relation to the reasons given for choosing an entrepreneurial career, including value-related reasons. These results are summarized in Table 9, which shows the number of coded interviews and references for each entrepreneurial-regulation group in relation their reasons for career choice. Importantly, the results suggest that the stronger the entrepreneurial-regulation group, the more frequently entrepreneurs cited reasons of creativity, self-realization and altruism in relation to their career choice. Those in the higher group also cited more

reasons, and therefore displayed more complex decision means in this context. In contrast, the reasons of independence and challenge appeared slightly more common among all groups. While contrary to some studies (e.g., Korunka et al., 2003), but agreeing with others (e.g., Brenkert, 2002; Velamuri, 2002), analysis showed that financial gain was rarely cited by any group.

**TABLE 9**  
**Entrepreneurial-Regulation and Entrepreneurial Career Choice**

<b>Reasons given for Career Choice</b>	<b>Entrepreneurial-Regulation Group</b>					
	<b>Strong</b>	<b>(10)</b>	<b>Moderate</b>	<b>(10)</b>	<b>Weak</b>	<b>(10)</b>
Creativity	14	(8)	9	(6)	8	(3)
Self-realization	6	(5)	2	(1)	3	(2)
Altruism	7	(4)	2	(2)	5	(1)
Independence	12	(6)	6	(5)	3	(2)
Challenge	14	(6)	3	(3)	7	(4)
Financial Gain	1	(1)	1	(1)	2	(2)

Un-bracketed figures are the number of coding references

Bracketed figures are the number of interviews coded

Two other findings emerged. Firstly, entrepreneurs in the strong entrepreneurial-regulation group often spoke about their childhood and personal history when they talked about reasons for their career choice. However, those in the moderate and weak entrepreneurial-regulation groups said almost nothing about personal history in this context. Secondly, those in the strong group were more passionate (defined as the expression of emotion, excitement and eagerness) when talking about their career choice. Those in the moderate and weak groups were not.

As Table 9 shows, the analysis identified six broad reasons for adopting an entrepreneurial career: creativity, self-realization, altruism, independence, challenge and

financial gain. This result broadly agrees with Carter (2003) who recently identified the following reasons for entrepreneurial career choice: self-realization, financial success, innovation, recognition and independence. While he did not identify altruism, others have argued that altruism or social values are to be expected as reasons for choosing an entrepreneurial career (Brenkert, 2002; Velamuri, 2002). The following sections review each reason in greater detail.

### **Creativity**

Creativity has been identified as an inherent feature of entrepreneurship (Stewart et al., 1999). In this study, creativity was cited by most of those in the strong entrepreneurial-regulation group. Members of this group also talked about creativity with greater passion and excitement. For example, one said, *“I really, really like creating something and building it and building it fast, I like that initial excitement.”* This result is consistent with the literature on self-regulation. Firstly, studies have shown that people who act from a successful promotion orientation show greater creativity (Friedman & Forster, 2001), appear more open to change and novelty (Liberman, Idson, Camacho, & Higgins, 1999) and exhibit more positive emotion and eagerness (Grant & Higgins, 2003). Creativity has also been positively related to task self-efficacy (Bandura, 1997). In summary, if a person possesses relatively strong promotion pride and entrepreneurial self-efficacy, then they would typically exhibit a stronger tendency towards creativity in entrepreneurial pursuits.

### **Self-Realization**

As noted earlier, self-realization has been identified elsewhere as a factor in entrepreneurial career choice (Carter et al., 2003). It emerged in this thesis as well. For example, one person in the strong entrepreneurial-regulation group said about becoming an entrepreneur, *“It’s who you are, it’s your identity. It’s the way you meet people, it’s the*

*way you help people, it's the way you get to see the world.*" This result may be partly explained by the fact that a promotion orientation has been shown to be strongly associated with a more independent (as opposed to interdependent) self-construal (Lee et al., 2000). That is, one would expect people with a relatively strong sense of promotion pride to be more motivated by goals that offer self-realization of their independent self. More broadly, this finding reflects the fact that social cognition and self-regulation are fundamental features of human psycho-social functioning and integral to selfhood (Higgins, 2002).

Furthermore, the intensity of self-regulation is conditioned by the level of importance and meaning that an individual attaches to specific goals. In particular, some goals evolve from being extrinsic motives to being central to a person's sense of self. Thus, an activity becomes integrated within the person's selfhood. Typically, such core goals are then subject to more intense modes of self-regulation, given that they encapsulate a person's major life goals (Carver & Scheier, 1998).

Another aspect of self-realization relates to family background. As one entrepreneur in the strong group said, *"there must be some kind of genetic predisposition I think that ignites a flame somewhere."* Similar connections were made between self-realization and personal history by other participants in the strong entrepreneurial-regulation group. This finding may be partly explained by the fact that early family history plays a significant role in determining promotion pride. Family history is also an important factor in a person's socialization and framework for self-reference and goal-directedness (Karoly, 1993). In summary, the literature supports the finding that strong entrepreneurial-regulation is related to a stronger sense of past and future self-realization as reasons for entrepreneurial career choice.



## Altruism

The next reason given for entrepreneurial career choice was altruism. Once again, it was more common amongst those in the strong entrepreneurial-regulation group. For example, one of the interviewees in that group referred to his early childhood experiences, saying, *“as a kid I always thought we’re on this planet to do something, not to take something, to put something back.”* Another exhibited positive emotion when she said, *“I’m passionate about creating a business and making something from nothing into something where people are employed and they grow and we create jobs for people and you create an enterprise.”*

Possessing such altruistic goals suggest that a person’s professional activities are integral to their social identity (Carver & Scheier, 1998). For that reason, such goals are subject to more intense self-regulation. Furthermore, promotion pride has been shown to uniquely predict a person’s sense of purpose or goal directedness, which are key factors in determining one’s quality of life (Grant & Higgins, 2003). Acting in accordance with that orientation also means the strategic manner of goal pursuit suits the regulatory orientation, leading to a sense of regulatory fit and being right (Camacho et al., 2003). As noted earlier, a sense of personal success in this regard is associated with positive emotion and optimism (Grant & Higgins, 2003). In summary, the literature supports the finding that those with strong entrepreneurial-regulation will tend to focus on more purposive altruistic goals in the entrepreneurial task domain and feel more passionately about them.

## Independence

The desire for independence or autonomous self-direction has already been identified as a major career motivation for entrepreneurs (e.g., Shane, 2003; Vecchio, 2003). It also emerged as a common reason for entrepreneurial career choice in this study,

although it was somewhat more frequent among the strong and moderate entrepreneurial-regulation groups. For example, one interviewee in the strong group said, *“I want control of my life, that’s fundamentally it.”* Another member of that group linked it to his family history when he said, *“My father controlled his own destiny in a sense and I think its control of your own destiny.”* These results may be partly explained by the fact that strong task self-efficacy is associated with stronger self-confidence, which in turn endorses the disposition to autonomy (Scherer et al., 1989). In addition, promotion pride may encourage stronger self-confidence as well as optimism (Grant & Higgins, 2003) and may be associated with a more independent (as opposed to interdependent) self-construal (Lee et al., 2000).

### **Challenge**

Previous studies have also identified the desire for challenge as a common factor in entrepreneurial career choice (Stewart et al., 1999). Other related factors that have been identified include the adventurous pursuit of innovation and a readiness to respond to challenging opportunities (Allinson et al., 2000). Among the participants in this study, the desire for challenge was common in all groups, although once again it appeared somewhat more important among the strong and moderate entrepreneurial-regulation groups. For example, one member of the moderate group explained his career choice by saying, *“you can see an opportunity, you can pursue it, you can work with very interesting people on challenging problems.”*

The literature on self-regulation supports this finding. Firstly, as noted earlier, people with strong promotion pride tend to have a clear sense of purpose in life and are primarily oriented towards future positive achievements (Grant & Higgins, 2003). At the same time, self-efficacy is crucial for the pursuit of challenging tasks (Markman et al., 2002). Indeed, Bandura (1997) has argued that self-efficacy is a significant factor in

entrepreneurial commitment and goal pursuit. Thus, the literature supports the finding that if a person acts from promotion pride and self-efficacy in the entrepreneurial task domain, then the person will tend to seek more challenging tasks within that domain. It should be noted, however, that such motivational strength is related to the perception of difficult or challenging tasks, not to the nature of outcome goals as such.

### **Financial Gain**

The final reason identified for entrepreneurial career choice is the desire for financial gain. Despite historic assumptions about the significance of this motivation, few participants cited financial gain as a reason for their career choice (cf., Stewart et al., 1999). In fact, they were just as likely to say that it was not a major driver. As one participant said, *“It’s not the money, that’s a by-product if you’re successful.”* In fact, while many hoped for financial success, very few cited it as a reason for choosing to become an entrepreneur. This result is supported by the literature on regulatory pride and self-efficacy, which separately suggest that financial rewards are rarely sufficient to maintain task motivation and perseverance among entrepreneurs (Bandura, 1997; Brockner et al., 2004).

### **OPPORTUNITY RISK**

Analysis of the interview data also uncovered significant findings regarding the relationship between entrepreneurial-regulation and opportunity risk. In summary, entrepreneurs in the strong group were somewhat less likely to talk about opportunity risk. However, when they did so, they were more likely to associate risk with opportunity exploitation compared to opportunity evaluation. They were also more likely to associate risk with opportunity exploitation, compared to those in the moderate and weak entrepreneurial-regulation groups. Table 10 summarizes the results of the analysis of

entrepreneurial-regulation in relation to opportunity risk. Then table shows the frequency with which entrepreneurs spoke about opportunity evaluation risk compared to opportunity exploitation risk, in relation to their entrepreneurial-regulation group.

**TABLE 10**  
**Entrepreneurial-Regulation and Opportunity Risk**

Type of Risk	Entrepreneurial-Regulation Group					
	Strong	(10)	Moderate	(10)	Weak	(10)
Opportunity Evaluation	4	(4)	3	(3)	12	(7)
Opportunity Exploitation	8	(4)	3	(3)	5	(5)

Un-bracketed figures are the number of coding references

Bracketed figures are the number of interviews coded

In fact, members of the strong group were consistently more positive about opportunity evaluation and rarely used the term “risk” in a negative sense in this context. As one member of this group said regarding opportunity evaluation, *“So not being afraid of failure is important in that way and wanting to be successful is important.”* That is, those with strong entrepreneurial-regulation tended to frame new opportunity evaluation as positive risk (that is, the chance to make a gain), rather than as negative risk (that is, the chance to make a loss). Moreover, those in the strong group were often 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.”* These results suggest that members of the strong group exhibited a stronger promotion orientation in relation to the evaluation of new opportunities.

Regarding exploitation risk, on the other hand, the members of the strong group tended to be at least as aware and concerned as members of the moderate and weak groups.

As one member of the strong group said, “*Most of the risk it’s about execution.*” In fact, many of the strong group focussed on the consistent risks of executing in dynamic and unpredictable environments, knowing they had chosen challenging opportunities to exploit.

Importantly, the members of the moderate and weak entrepreneurial-regulation groups were twice as likely to associate risk with opportunity evaluation compared to opportunity exploitation. They were also twice as likely to associate risk with opportunity evaluation compared to those in the strong group. For example, one member of the weak 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.*” In other words, analysis of statements in the interview data suggests that those in the weaker entrepreneurial-regulation groups tended to frame opportunity evaluation in more negative terms – as the chance of a loss – and they were less willing to accept such risks as a result. In this way, they exhibited a stronger concern about potential losses in relation to the evaluation of new opportunities.

At the same time, the members of the moderate and weak groups spoke less frequently about exploitation risks, and when they did so, they tended to talk about potential disasters or worst-case scenarios. In fact, those in the moderate and weak groups 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 risk analysis during initial opportunity evaluation had reduced their exposure to exploitation risk.

Further analysis confirmed that those who focussed more on opportunity evaluation risk tended to frame it in more negative terms. They tried to analyse the opportunity in order to assess the risk of future losses rather than potential gains. 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 moderate and weak entrepreneurial-regulation groups spoke in this fashion, compared to those in the strong group. Members of the moderate and weak groups typically indicated they would only choose a new opportunity if they had identified the major risks of failure, then understood how to mitigate them.

Alternatively, as noted earlier, those in the strong entrepreneurial-regulation group were far more likely to talk about the potential gains from new opportunities. That is, they tended to frame opportunity evaluation as more positive risk and they were less focused on the chance of failure. As one of them remarked, *“The driving instinct is bite off more than you can chew and chew like crazy.”* Not surprisingly perhaps, those in the strong group also spoke more often about using gut and intuition in this area of risk taking, rather than conducting analytical risk assessments.

These results accord with the literature on promotion pride and self-efficacy. Those with stronger promotion pride and self-efficacy tended to view new opportunities in terms of potential gains and they approached them with more confident eagerness means and a willingness to take risks (Baron, 2004a; Brockner et al., 2004). Their perception of opportunities was dominated by concerns about potential gains and non-gains. Whereas those with weaker promotion pride and self-efficacy tended to view new opportunities in terms of potential losses and they approached them with stronger vigilance means and were less willing to take risks. Consequently, their perception of new opportunities included a greater concern about potential losses and non-losses (cf. Higgins et al., 2001). These findings agree with Sarasvathy, Simon and Lave (1998), who reported a study in which entrepreneurs were observed to accept risks as given and then to focus on controlling the outcomes. They also found that entrepreneurs tend to frame problems in

terms of more personal values and consequently assume greater responsibility for risk outcomes.

Another finding relates to temporal orientation in risk perception. Those with strong 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 evaluation, often referring to a long term vision or set of goals. As one member of the strong group explained, *“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 in the strong group tended to view opportunity evaluation as the first step in a long-term process. However, almost no-one in the weak or moderate groups spoke in this fashion. As noted earlier, entrepreneurs in the weak and moderate groups tended to view opportunity evaluation in terms of risk mitigation resulting in manageable execution risks. Therefore, they tended to perceive opportunity risks as more near term and proximate and not in terms of visionary goals or aspirations. One typically 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 summary, the results suggest that entrepreneurs with strong entrepreneurial-regulation tended to frame new opportunity evaluation as a more positive risk and tended to seek such risks. At the same time, they tended to perceive major negative risks relating to opportunity exploitation and sought to mitigate or avoid those risks. This may be partly explained by the fact that those in the strong 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 strong 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 entrepreneurial-regulation tended to perceive more negative risks in relation to opportunity evaluation and were less willing to take those risks. Yet they appeared to perceive fewer negative risks in relation to opportunity exploitation and were more willing to accept those risks. This finding may be partly explained by the fact that those in the weaker 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 evaluation, but rather focused on more tangible and operational business goals. These findings are summarized in the model of entrepreneurial-regulation groups and opportunity risk show in Figure 5. In this Figure, “stronger” Entrepreneurial-Regulation refers to members of the strong group plus stronger members of the moderate group. While “weaker” Entrepreneurial-Regulation refers to members of the weak group plus weaker members of the moderate group.

**FIGURE 5**

**Model of Entrepreneurial-Regulation and Opportunity Risk**

		<b>Entrepreneurial-Regulation Groups</b>	
		<b>Weaker</b>	<b>Stronger</b>
<b>Opportunity Evaluation Risk</b>		More negative perception Greater propensity to avoid	More positive perception Greater propensity to seek
	<b>Opportunity Exploitation Risk</b>	More positive perception Greater propensity to seek	More negative perception Greater propensity to avoid



These findings are supported by empirical studies into entrepreneurial risk taking. For example, Palich and Bagby (1995) found that entrepreneurs' risk perceptions vary depending on their cognitive characteristics. In addition, Krueger and Dickson (1994) reported that subjects who believe they are very competent at decision making see more opportunities in a risky choice and take more risks. On the other hand, those who believe they are not very competent see more threats and take fewer risks. Importantly, they reported that the perception of opportunities was unexpectedly not related to the perception of threats. They interpreted these results to show that the perceived likelihood of an event depends on whether the event is a loss or a gain, reinforcing the need to distinguish between promotion focus (seeking gains) and prevention focus (avoiding losses).

### **DECISION HEURISTICS**

Five recurrent heuristics were identified during the analysis: (1) does the opportunity fit the core strategy (strategic fit); (2) do I know the market (market knowledge); (3) do I trust the other party (trusting others); (4) does it feel right (trusting gut); and (5) what's the worst that could happen (worst case). Those heuristics were often used to gauge the risks associated with new opportunities and whether or not to explore opportunities further or quickly reject them. They functioned as simple stopping rules or one reason bases for decision, comparable to the Fast and Frugal Heuristics discussed earlier (see Gigerenzer, 2001). From a strategic management perspective, these heuristics can be also regarded as examples of the simple rules often employed in strategic decision making (Eisenhardt & Sull, 2001; Eisenhardt & Zbaracki, 1992).

However, the pattern of usage differed between entrepreneurs depending on their entrepreneurial-regulation group. In particular, the stronger the group, the more likely the entrepreneur was to use heuristics in relation to opportunity evaluation. Similarly, the more

intuitive heuristics, such as trusting others and trusting gut, were more frequently used by those with stronger self-regulation. On the other hand, the market knowledge heuristic was more prevalent among the weak entrepreneurial-regulation group. These results are summarized in Table 11 which shows the results of interview analysis for entrepreneurial-regulation and heuristics in opportunity evaluation and exploitation.

**TABLE 11**  
**Entrepreneurial-Regulation and Heuristics in**  
**Opportunity Evaluation and Exploitation**

Heuristics Used	Entrepreneurial-Regulation Group					
	Strong (10)		Moderate (10)		Weak (10)	
	Evaluation	Exploit	Evaluation	Exploit	Evaluation	Exploit
Strategic Fit	12 (8)	2 (2)	7 (5)	3 (2)	11 (5)	(0)
Know the Market	0 (0)	0 (0)	3 (2)	1 (1)	7 (4)	(0)
Trusting Others	3 (2)	0 (0)	6 (4)	2 (2)	2 (1)	(0)
Trusting Gut	4 (3)	1 (1)	2 (2)	0 (0)	4 (3)	(0)
Worst Case	0 (0)	2 (2)	0 (0)	1 (1)	2 (1)	(0)

Un-bracketed figures are the number of coding references

Bracketed figures are the number of interviews coded

It is important to note that heuristics identified in this thesis were rarely used in relation to opportunity exploitation. Most entrepreneurs approached those decision tasks in a more systematic and considered fashion, often taking time to gather and analyze information and especially relating to risk. As reported earlier, one member of the strong group said, *“Most of the risk it’s about execution.”* Indeed, the strong group typically focussed more strongly on the consistent risks of executing in dynamic and unpredictable

environments, knowing they had chosen challenging opportunities to exploit. That appeared to prompt a more systematic approach to decision making about execution and less frequent use of heuristics. The following sections discuss the results for each heuristic in greater depth.

### **Strategic Fit**

The “strategic fit” heuristic was often used in relation to opportunity evaluation and sometimes in relation to opportunity exploitation. It was typically used as a simple test to decide whether or not an opportunity was worth considering at all. Most members of the strong entrepreneurial-regulation group indicated that they used this heuristic in that way and about half of those in the moderate and weak groups did so as well. As one member of the strong group said, *“Normally it’s something that you feel would, in my case, would align itself with the strategy. It’s normally something where you can see it’s going to bring good strategic value to the company basically.”* Another variant of this heuristic was to compare an opportunity with their vision. Some also spoke of their vision and core strategy driving opportunity search. This approach was also more common among those with strong entrepreneurial-regulation. Consequently, if an opportunity did not fit the core strategy or vision, then it would typically be rejected, and especially if negative information emerged such as major risks or doubts about partners.

In this way, many of the interviewees made fast decisions about the potential upside and downside risks of a new opportunity. If it did not fit the core strategy, then it was seen as a greater risk to the business and they were more likely to forego the opportunity. As one explained, she aimed *“to get the things that I know are core and again that comes back to a risk thing.”* On the other hand, in situations where this heuristic resulted in a more positive answer and the opportunity did fit the core strategy, then the degree of fit would help them to decide what amount of time and effort should be

dedicated to exploring an opportunity in a more systematic fashion. Furthermore, if the fit with the core strategy or vision was very strong and the opportunity was urgent, then some entrepreneurs would proceed with an opportunity solely on the basis of that strong fit.

As noted earlier, the use of this heuristic appears to be positively related to stronger entrepreneurial-regulation. This result is supported by studies which have shown that a promotion orientation is associated with more global processing and visionary thinking (Förster & Higgins, 2005) and that promotion pride is related to greater eagerness means in seeking to ensure strategic gains in decision making scenarios (Higgins et al., 2001). While other studies have shown that promotion pride itself is positively related to greater optimism about future goals and to a sense of purpose or goal directedness (Grant & Higgins, 2003).

Similarly, strong domain self-efficacy is associated with the perception of more opportunities in a given situation and greater confidence to successful exploit such opportunities (Bandura, 1997; Vecchio, 2003). Thus, some argue that entrepreneurial self-efficacy is closely related to perceptions of the feasibility and potential of new opportunities (Krueger et al., 2000). Previous studies of promotion pride and self-efficacy therefore support the finding that the “strategic fit” heuristic would be more prevalent among with stronger entrepreneurial-regulation.

From a more traditional perspective, instances of this heuristic could be regarded as evidence of over-confidence bias and hence a source of cognitive error. It could be argued that entrepreneurs have an inflated sense of strategic capacity and over-ambitious goals and that this leads them to make cognitive errors in decision making (Busenitz et al., 2003). Indeed, studies have shown that promotion pride is associated with greater optimism and a more eager approach towards new task goals (Grant & Higgins, 2003). High self-efficacy is also associated with optimism and a stronger sense of self-confidence in relation to new

task goals (Bandura, 1997). However, the entrepreneurs included in this thesis seldom relied solely on the “strategic fit” heuristic to select new opportunities. They often used this heuristic as a necessary condition, but it was rarely sufficient. If a new opportunity passed the strategic fit test, they would typically spend more time analyzing it further before making a firm commitment to proceed.

### **Know the Market**

The “know the market” heuristic was also used by entrepreneurs as a simple decision rule about whether to explore an opportunity or not. As one entrepreneur said, *“But it all comes down to the fact that I wouldn’t do that unless I knew particularly the market and why I was there in the first place.”* Interestingly, this heuristic was more common among those in the moderate and weak entrepreneurial-regulation groups and less frequently used by those in the strong group. In that respect, it showed the reverse pattern of usage, when compared to the “strategic fit” heuristic.

Previous studies provide reasons why that finding could be expected. For example, a number of studies suggest that people who do not have a history of prior success or demonstrated expertise will exhibit weaker self-efficacy about new domain tasks (Stone, 1994; Vecchio, 2003). While Grant and Higgins (2003) reported that weaker promotion pride was associated with less risk taking and a less ambitious approach towards new tasks. These studies all suggest that entrepreneurs with weaker promotion pride and self-efficacy (that is, weaker entrepreneurial-regulation) would be less confident about opportunities outside their area of established domain mastery. Therefore, they would tend to remain more closely aligned with their areas of previous experience and knowledge and thus use the “market knowledge” heuristic more often. On the other hand, those with stronger entrepreneurial-regulation would tend to be less concerned about prior knowledge and

experience and more willing to select opportunities in novel markets which had good strategic fit. This conclusion is also supported by recent empirical studies (Parker, 2006).

From a more traditional perspective on heuristics, it could be argued that the “market knowledge” heuristic is evidence of representativeness bias and hence another source of potential cognitive error. That is, it could be argued that entrepreneurs exhibit representativeness bias when they assume that prior market knowledge is a basis for understanding the risks associated with new opportunities in the same market (Busenitz & Barney, 1997; Shane, 2003; Simon & Houghton, 1999). Yet even if one concedes this point about bias, some scholars claim that the use of such heuristics is a valuable and even necessary element of effective entrepreneurial decision making, given that they often recognize opportunities and imagine new venture ideas in emerging and ill-defined markets (Sarasvathy, 2004a). A few interviewees expressed the same opinion when they spoke about the risks of “analysis paralysis” when there was insufficient information available to reach a definitive position.

### **Trusting Others**

The “trusting others” heuristic appeared useful because of the reliance entrepreneurs place on third parties. Some of the entrepreneurs explained that with limited resources and high uncertainty, they had to trust their collaborators to provide honest and reliable advice and support. Therefore, if they felt they could not trust a party that was critical to a new opportunity, then most would quickly reject it despite other promising evidence. As one entrepreneur remarked, *“I’ve turned down doing business with people that I didn’t respect or didn’t think...like somebody was a rogue and a charlatan regardless of how good the opportunity was, I wouldn’t do it.”* On the other hand, if the party could be trusted, then they would feel sufficiently confident to explore the

opportunity further. In a few cases, very strong levels of trust were regarded as sufficient grounds to pursue an opportunity without any further investigation.

As shown earlier in Table 11, the “trusting others” heuristic was moderately common among all the entrepreneurs, suggesting that trusting others is not dependent on the level of entrepreneurial-regulation. In fact, this heuristic may be related to aspects of entrepreneurial-regulation in a more negative sense. Firstly, a strong promotion orientation is related to a more independent self-construal, as opposed to an interdependent self-construal (Lee et al., 2000). This may cause people who act from promotion pride to be less concerned and reliant on interdependent decision means such as relationship trust. Instead, they may tend to rely on more independent cognitive means such as personal vision and knowledge, as suggested by the findings discussed earlier regarding the “strategic fit” and “know the market” heuristics.

Secondly, people with a strong sense of self-efficacy for a particular task domain tend to show greater self-confidence in that domain. They may also display a greater sense of personal autonomy (Stewart et al., 1999). They are also more highly motivated by independent goals. All these factors may cause self-efficacious people to rely less on others and more on their own skills and knowledge when making decisions. For these reasons, entrepreneurs may not rely as heavily on the “trusting others” heuristic as other types of managers and especially those in large established organizations (March & Shapira, 1987).

### **Trusting Gut**

Use of the “trusting gut” heuristic about new opportunities was also unrelated to levels of entrepreneurial-regulation. It appeared to be consistently and moderately used within all three groups. Interestingly, some entrepreneurs spoke of trusting their gut in relation to knowing a particular market and recognizing opportunities in it. As one interviewee said, *“at the end of the day it boils down to judgment you know, so I’m quite*

*keen to go with gut feel. It's like I said this is how I feel about it.*" Such instances of the "trusting gut" heuristic were often explained in terms of intuition based on prior experience and accumulated expertise. They were also linked to other heuristics such as "strategic fit." That is, some entrepreneurs talked about trusting gut based on their sense of fit with their core strategy and vision. Some of them also identified trusting their gut with intuitions about markets derived from experience and expert knowledge. In this way, different heuristics worked together or reinforced each other. In other cases, however, the entrepreneur would need to search for additional information or advice in order to assess strategic fit or a market and in that case, they would not rely on the "trusting gut" heuristic.

While this heuristic was not related to different levels of entrepreneurial-regulation, there is evidence to show that it may be positively related to promotion pride. For example, studies have shown that people with stronger promotion pride tend to be more visionary in their decision making and may be more intuitive when considering longer range scenarios (Higgins & Spiegel, 2005). They also experience a stronger sense of making the right decision when they employ eagerness approach means in relation to potential attainment task goals (Higgins et al., 2003). In other words, when an entrepreneur approaches the evaluation of new opportunities using eagerness means, then he or she will have a stronger feeling of making the right decision and this is similar to the sense of confirmatory gut feels described by some of the entrepreneurs in this thesis.

### **Worst Case**

The "worst case" heuristic was least common and was primarily used to assess risk in opportunity evaluation. If the answer to the question "what's the worst that could happen?" suggested that the worst case was unacceptable, then the opportunity would be quickly rejected. In that way, the heuristic served as a simple rule to reject some opportunities quickly, or as a simple rule to stop further information search and risk



analysis. As one person said, *“is this going to bring the company down if you make a mistake or is it going to be something that’s not hugely relevant.”* Alternatively, if the answer was more positive and the worst case was acceptable, then the opportunity might be explored further, assuming it passed other simple tests relating to strategic fit and market knowledge. In that way, the worst case heuristic was sometimes used to justify more detailed and systematic risk analysis on those opportunities where the risk was deemed to be acceptable.

However, if the worst case entailed relatively minor losses, then some entrepreneurs would use this heuristic as the basis for adopting an opportunity that fitted their strategy or vision. That is, if the fit with core strategy was strong or they knew the market well, and the worst case was acceptable, then they may proceed to adopt the opportunity without further risk assessment. In this way, entrepreneurs sometimes used simple heuristics in combination with each other. As one said, *“So you look for that fit and look for fit with strategy, fit with values, fit with the kind of business you know we are in, either because it’s complementary or because it’s supportive.”*

The fact that the “worst case” heuristic was rarely used may be partly owing to the self-regulatory attributes found among entrepreneurs. Overall, the entrepreneurs displayed an association between promotion pride and entrepreneurial self-efficacy. As noted earlier, this suggests that entrepreneurs tend towards confidence and commitment in the eager pursuit of positive attainment goals in the entrepreneurial task domain. At the same time, they tend to avoid errors of omission in that task domain and have a bias towards acts of commission in the pursuit of positive goals. Consequently, they would tend to be less concerned with potential losses and worst case scenarios (Higgins et al., 2001).

Similar implications follow if someone acts with relatively strong self-efficacy. Such people will possess stronger levels of self-confidence for the particular task and thus

be less likely to focus on failure scenarios when considering their strategic options (Bandura, 1997). A number of studies have argued that this applies especially to entrepreneurs (Forbes, 2005a; Krueger Jr & Brazeal, 1994; Vecchio, 2003).

### MANAGING HEURISTIC BIAS

Few occurrences of the heuristics discussed above appeared to be associated with extreme bias and cognitive error. In fact, these heuristics were often related to deliberate attempts to avoid such problems. As one of the entrepreneurs explained:

*“there is passion and emotion in this business, so in a sense you have to have some passion to take that risk and that’s often obviously the hallmark of an entrepreneur. So in a sense you’ve got to keep playing tricks to yourself and making sure there are some checks and balances.”*

Other entrepreneurs made similar remarks, and especially in situations where strong emotions were involved and they wanted to avoid the negative influence of affect intrusion. In this way, and contrary to negativist assumptions, many entrepreneurs exhibited deliberate strategies to mitigate potential heuristic bias and cognitive errors such as affect intrusion and attribution error (Baron, 1998; Mitchell et al., 2000). They recognized the cognitive risks associated with heuristics that were employed with limited time and information and took deliberate steps to make sure they were not using these simple heuristics in a biased fashion. For example, they would seek objective advice from trusted sources or use the heuristics more often as simple “stop” rules and less often as “go” rules. For example, one member of the strong group said that:

*“On the negative side you know I’d probably be a bit more inclined to follow your instincts, because the downside is, you want to be covering your downside in a sense all the time. Being entrepreneurial and naturally optimistic, it’s probably*

*more of a question of trying throttle back from clearly being positive and force yourself to look more at the things that could go wrong.”*

That is, he said he would reject an opportunity based on a simple heuristic, but would often seek confirmatory evidence before deciding to pursue an opportunity.

These findings suggest that the focus on negative heuristic biases may be overstated with respect to entrepreneurial decision making (cf., Busenitz, 1999; Simon & Houghton, 1999). Too often, that is, scholars have assumed the classically inspired critique of heuristics as less than rational, and that has framed their research focus. However, as Herbert Simon (1979) argued many years ago, the classical ideal of unbounded rationality and affective neutrality is an idealistic view that often bares little resemblance to observed human cognition and behavior. Indeed, the results of this thesis suggest that entrepreneurs are more often aware of the potential for heuristic biases and therefore adopt deliberate tactics to avoid the cognitive errors that may arise when employing heuristics.

Consequently, the results tend to support the general argument that heuristics can be effective and appropriate decision means (Gigerenzer, 2000). As noted earlier in Chapter 2, that general finding is supported by a range of studies into the relationship between heuristics and self-regulation. For example, stronger self-efficacy has been found to be related to a more disciplined use of heuristics in information search and processing in complex tasks (Wood et al., 2000). Other studies have suggested that regulatory orientation is also significant in the management of bias in decision making, although those processes are not yet clearly understood (Kluger et al., 2004; Liberman, Idson, & Higgins, 2005).

## DECISION SPEED

Analysis of the interview data also suggested that self-regulation was positively related to decision speed. In particular, the analysis showed that entrepreneurs in the strong entrepreneurial-regulation group were much more likely to speak about making rapid decisions, whereas those in the weak group were more likely to talk about being patient or slow in their decision making. Across all three groups, references to decision speed were commonly related to dealing with risk and uncertainty, responses to time pressure and to the consequences of emotionality and affect intrusion. These results regarding entrepreneurial-regulation and decision speed are summarized in Table 12, which shows the number of coded interviews and references for different types of decision speed.

**TABLE 12**

### Entrepreneurial-Regulation and Decision Speed

Types of Decision Speed	Entrepreneurial-Regulation Group					
	Strong	(10)	Moderate	(10)	Weak	(10)
Rapid	16	(5)	4	(3)	5	(3)
Patient	1	(1)	1	(1)	4	(2)
Rushed	3	(2)	1	(1)	2	(2)
Slow	1	(1)	0	(0)	4	(2)

Un-bracketed figures are the number of coding references

Bracketed figures are the number of interviews code

Regarding rapid decision making, some members of the strong entrepreneurial-regulation group linked it directly to their quest for attainment goals. As one said, *“So not being afraid of failure is important in that way and wanting to be successful is important.”*

*Because you're going to fail and so you've just got to fail fast and sort of get it done and get on to the next thing.*" In that respect, he displayed evidence of possessing a strong promotional orientation and eagerness means towards attainment goals and correspondingly weak vigilance means towards avoiding losses. He was also relatively self-efficacious about his pursuit of such attainment goals, adding that, *"understanding what the big picture looks like I guess enables you to quickly go let's do this because that's kind of on the plan that we're doing."* In fact, this entrepreneur had many years of experience in founding and running his own business, as well as previous employment in large corporations.

Another member of the strong group also explained that his ability to make rapid decisions was based on his prior history. He said, *"I think you learn an awful lot about how to make a decision quickly.... To me now I think that decisions are easy, I'm sure you learn a lot along the way."* In other words, he referred to his prior history of decision making in the entrepreneurial task domain. That history had given him a sense of masterful self-efficacy in decision making when he said that *"decisions are easy."* It had also given him a strong sense of positive achievement in the past, which is an key attribute of a sense of promotion pride (Higgins et al., 2001).

Some members of the weak entrepreneurial-regulation group also advocated rapid decision making. One young female entrepreneur was particularly eloquent on this topic. She explained that her first year of running her own business had taught her valuable lessons about moving rapidly. She said, *"I think the biggest lesson for me so far I've learnt is that you really need to make decisions on the run. You don't really have the luxury of time, no information, so you just have to go with your gut instinct a lot of times."* She further added, *"My philosophy nowadays is really it's better to make a wrong decision than not make a decision at all. And also my feeling is that a lot of time there's no*

*absolutely wrong decisions.*” Interestingly, this young woman was acutely aware of her lack of prior experience. She displayed weak self-efficacy in the entrepreneurial task domain, as well as a poor sense of prior success in related goal achievement. In fact, she had only decided to become an entrepreneur one year earlier after she was made redundant from an earlier position. Having said that, she was optimistic and already enjoying substantial success in the marketplace.

A number of members of the strong entrepreneurial-regulation group regarded rapid decision making as a personal strength. As one of them said, *“I think that’s a strength that I’ve got as well, because I definitely don’t procrastinate in terms of decisions.”* Numerous members of the strong group also displayed a preference for eagerness means and approaching gains. They typically felt confident under time pressure and were ready to embrace the related risks of failure and loss that could result from rapid decision making. Indeed, some displayed their promotion pride transparently by explicitly stating their preference to avoid errors of omission rather than errors of commission (cf. Grant & Higgins, 2003). As one female member of the strong group remarked:

*“I jump in and make a decision which then might turn out to be the wrong one and then you’ve got to backtrack. So that would be my weakness, that’s a strength too, in that I can make decisions very quickly on the fly and I’ll probably get more right than wrong.”*

Notably, a number of the entrepreneurs also used heuristics when making rapid decisions. Firstly, they would seek advice from people they trusted, thereby using the “trusting others” heuristic that was discussed earlier in this chapter. If the advice confirmed their inclinations, then they would be prepared to make a rapid decision. Secondly, some would ask themselves what was the worst that could happen. If the potential downside was acceptable, then they would be prepared to make a rapid decision under time pressure.

Thirdly, they would seek out confirmatory evidence regarding the market or some other significant factor in the decision. One female member of the strong group explained her search for quick confirmatory evidence as follows:

*“I might within two minutes have the information that I’ll think I’ll have really made a gut decision that I’ll think yes this is worthwhile, then I’ll go and hunt around for information that will help me to decide that’s the right decision.”*

Simultaneously, she exhibited use of “strategic fit” and “trusting gut” heuristics. In that way, heuristics supported the rapid decision making and eager decision means that appeared typical of strong entrepreneurial-regulation.

However, unlike members of the strong entrepreneurial-regulation group, those in the weak group especially tended to display greater caution and resistance to rapid decision making. As one of them remarked, *“I think it is a failure on my part if I have to make a decision quickly and I haven’t thought about it in advance.”* He was especially resistant to time pressures: *“I take the view that I won’t be pressured, I won’t be forced.... The time frame will not drive the decision that I make.”* The same man resisted emotional pressures as well. He said about making decisions under emotional pressure, *“they don’t fall into my analytical techniques very well, because they involve emotions and things that aren’t necessarily very quantifiable.”*

Another member of the weak group explained that being rushed to make decisions rang alarm bells and prompted him to become suspicious of the other party. He said, *“I am not going to make a decision because I am inherently suspicious of your motivation for asking that. I then can go through my processes and work it out properly.”* Unwittingly, he was demonstrating the cautiousness and negative feelings that are typical of a prevention orientation (Camacho et al., 2003; Higgins et al., 1997). Not surprisingly, members of the weak group used the “worst case” heuristic in ways that related to slower decision making.

Therefore, in contrast to the strong group, members of the weak group displayed more features of prevention focus. In fact, they showed more evidence of combining both promotion focus and prevention focus in relation to decision speed. They were sometimes willing to make rapid decisions in the pursuit of gains when they felt confident. Possession of detailed information and risk mitigation were often critical factors in allowing them to do this. Yet at the same time, they were not willing to make rapid decision when they lacked confidence, felt under stress or where they could not adequately manage the risks. These behaviors confirm earlier studies on this topics (Förster et al., 2003).

In summary, the results suggest that entrepreneurial-regulation is positively related to decision speed within the entrepreneurial task domain. Members of the strong group, in particular, spoke about the need for rapid decision making regarding opportunity evaluation and exploitation and thus avoiding errors of omission. They were also more confident and self-efficacious in their ability to make rapid decisions in the pursuit of positive attainment goals. On the other hand, those in the weak group often resisted rapid decision making. They were less willing to act under pressure and were more aware of potential losses that could result from rapid decisions and errors of commission. They typically felt less confident and self-efficacious in their ability to make rapid decisions.

These results are supported by the literature, which shows that promotion pride is related to being eager, risky and oriented toward the future presence of positive outcomes, whereas prevention pride is related to being careful, cautious and oriented toward ensuring against negative outcomes (Grant & Higgins, 2003). Promotion pride is also positively related to choosing speed over accuracy, while prevention pride is positively related to choosing accuracy over speed (Higgins et al., 2001). Related studies have also shown that promotion focus is associated with making faster and more risky decisions to ensure hits,



rather than slower cautious decisions to avoid losses (Förster et al., 2003; Higgins & Spiegel, 2005).

These results suggest that if an entrepreneur has strong entrepreneurial-regulation, he or she will be oriented towards faster decision making and feeling self-efficacious in making such decisions. Indeed, studies have shown that the stronger a person's sense of self-efficacy in a given task domain, the more likely they are to maintain goal commitment and the momentum of decision making (Bandura, 1991). Self-efficacy is also related to the ability to "ferret out information, interpret and integrate feedback, test and revise knowledge and implement selected options" in complex and dynamic decision making environments (Bandura, 1997:451). As noted earlier, some of the strong group adopted such behaviors in relation to rapid decision making.

## **VALUES AND ETHICS**

The final set of findings that emerged during analysis related to the use of values and ethics in decision making. Recall that values were defined as the core beliefs and principles that are held to be important and desirable by some society, group or individual persons. While ethics were defined as the conception or standards of right, good or acceptable conduct or behavior (Joyner et al., 2002). For any given group or individual person, ethics are often based on values. Notably, references to values and ethics were especially common among those in the strong entrepreneurial-regulation group, yet members of the moderate and weak groups made very few references to values in decision making. The results of the analysis of entrepreneurial-regulation, values and ethics in various areas of decision making are summarized in Table 13.

**TABLE 13****Entrepreneurial-Regulation, Values and Ethics in Decision making**

<b>Topics Related to Values and Ethics</b>	<b>Entrepreneurial-Regulation Group</b>					
	<b>Strong</b>	<b>(10)</b>	<b>Moderate</b>	<b>(10)</b>	<b>Weak</b>	<b>(10)</b>
Career Choice	4	(3)	0	(0)	1	(1)
Personal Motivation	6	(4)	0	(0)	5	(3)
Systematic Decision Style	2	(1)	0	(0)	1	(1)
Intuitive Decision Style	6	(4)	2	(2)	0	(0)
Opportunity Evaluation	3	(2)	1	(1)	0	(0)
Self Assessment	2	(2)	1	(1)	0	(0)

Un-bracketed figures are the number of coding references

Bracketed figures are the number of interviews coded

Table 13 shows that references to values and ethics co-occurred with a number of other themes: career choice, personal motivations, systematic and intuitive decision styles, opportunity evaluation, and self assessment as a decision-maker. These results broadly reflect the influence of self-regulation on goal-directed behavior and decision making (Carver & Scheier, 1998; Payne et al., 1993), which views values and ethics as both inputs and outputs of self-regulated decision processes. These processes occur in each of the three major phases of goal-directed thought and decision making behavior: goal-setting, goal pursuit and outcome evaluation. The following sections discuss each type of value or ethical reference in greater detail.

### **Goal Setting**

Members of the strong entrepreneurial-regulation group frequently referred to deeply held values when discussing major goal setting decisions, and especially in relation to their decision to become an entrepreneur in the first instance. For example, one young woman stressed that her decision to become an entrepreneur had been motivated by her

desire for autonomy. She said, *“I don’t want to be beholden to a corporation... as soon as you don’t serve a purpose, you’re done. That doesn’t sit well from a values perspective with me.”* Others expressed their commitment to entrepreneurship in terms of self-actualization goals, sometimes speaking in spiritual terms about their search for value and purpose in life. A number of those with strong self-regulation also referred to altruism. For example, one of the interviewees in that group referred to his early childhood experiences, saying, *“as a kid I always thought we’re on this planet to do something, not to take something, to put something back.”* Another exhibited positive emotion when she said, *“I’m passionate about creating a business and making something from nothing into something where people are employed and they grow and we create jobs for people and you create an enterprise.”*

Only one member of the moderate and weak entrepreneurial-regulation groups spoke in this fashion, although he did so with deep conviction. He said of his career choice, *“this for me goes to the heart of my character and in some ways almost spiritual questions. The nature of my life and my quest as a human being, and my ability to reflect on what is important to me and what isn’t, and what to feel passionate about and so on.”*

These results broadly agree with the literature on self-regulation. To begin with, Grant and Higgins (2003) have show that promotion pride uniquely predicts a sense of purpose in life or goal directedness. It follows that entrepreneurs with stronger promotion pride will tend to have a stronger sense of life purpose and goal directness. When combined with a strong sense of self-efficacy in the entrepreneurial task domain, their sense of life purpose and goal directedness will find expression in confidence and commitment to entrepreneurial goal pursuits (Krueger Jr & Dickson, 1994). As a result, their career decisions will tend to exhibit a stronger association with life purpose and higher values.

## Goal Pursuit

Once again, members of the moderate and weak groups did not mention values and ethics in relation to goal pursuit activities such as opportunity exploitation. However, those with strong self-regulation frequently did so. For the strong group, decision making was not simply a business activity, but linked to their sense of personal identity. As one woman stated, *“I will never compromise my integrity, no matter how hard that decision is, and that’s just me. I will never be dishonest, those things are really, really important to me. So values, I guess in terms of people.”* The youngest member of the strong group put it simply when he said, *“don’t be evil.”* For him, personal ethics were an overriding factor in decision making. He added, *“If you do bad stuff, bad stuff will happen to you, even in business. That does play a part in my decision making.”*

It is also notable that values and ethics were rarely associated with systematic decision making in goal pursuit. Rather, values and ethics were implicitly linked to intuitive decision making, although only for those with strong entrepreneurial-regulation. For example, some relied on ethical congruence to make intuitive decisions about which opportunities to pursue, and how to exploit them. One said that if he assessed *“a partner and I just didn’t like him, I didn’t like his style or his ethics or anything, that could be just it.”* Approximately half of the strong group spoke in similar fashion. They relied on shared values and ethical standards to select and evaluate potential opportunities and partners. Without such congruence, however, they would either reject the opportunity or partnership, or at least avoid intuitive decision making and perform more systematic analysis.

A few of the strong group even linked intuitive decision making to spiritual intuitions. One in particular recounted some highly unusual paranormal experiences. In sober and deliberate tones, he explained how he had been mysteriously guided in decision making: *“I’ve had things like that happen to me and I can’t explain that to anybody, that’s*

*not in any text book. I don't know what to do with it, except follow it, because when I don't follow it I'm in trouble, I make mistakes.*” Notably, he had some of the highest scores for both promotion pride and entrepreneurial self-efficacy. Moreover, as one could expect from a person with strong promotion pride (Higgins et al., 2001), he attributed much of his approach to entrepreneurship to his family background: *“You learn in a family where you're running a business, you learn the fundamentals of running a business. It's sort of like a religion.”* It is also worth noting that he was the oldest member of the strong entrepreneurial-regulation group, and at the time of the interview he was the CEO of a very successful multinational company which he had founded some years earlier.

These findings broadly agree with the literature. Both promotion pride and self-efficacy are positively related to more imaginative and exploratory goal pursuit means and styles of thinking (Higgins, 2002; Wood et al., 2000), and people with a strong promotion focus are more concerned with stronger values and tend to think in global terms (Förster & Higgins, 2005; Grant & Higgins, 2003). Studies also show that people with a strong promotion focus will tend to exhibit a more independent self-construal, while those with a chronic prevention focus tend to exhibit a more interdependent self-construal. When considered in terms of values and ethics, this implies that promotion pride is associated with values and ethics related to personal self-realization through independent action, albeit for both private and social goods. Whereas prevention pride is associated with a more interdependent self-construal (Lee et al., 2000; Lockwood, Marshall, & Sadler, 2005). Assuming that entrepreneurship is associated with an independent self-construal, then one could expect entrepreneurs to have a greater commitment to personal ethics in decision making (Brockner et al., 2004; Hull, 2002).

## Outcome Evaluation

Once again, those with weaker entrepreneurial-regulation did not refer to values and ethics in the context of decision outcome evaluation. They assessed decision outcomes in more organizational and operational terms. In contrast, those in the strong group tended to evaluate the value of decision outcomes in terms of both values and ethics. They assessed whether or not they had maintained personal integrity and authenticity in decision making. They reviewed their decision behavior in terms of ethics as well as economic performance criteria. As one woman explained, she reviewed her decision making performance by asking, *“is this the best decision for me, is this the best decision for the investors, is this the best decision for the incoming investors, is this the best decision for the customer?”* Another female member of the strong group remarked about entrepreneurs that, *“you’ll find that there’s an incredible amount of energy and, what’s the word, ethics around who we are. I think that’s why you know the entrepreneurs that gave us a bad reputation back in the early years we don’t like.”* Both women evaluated their performance as decision makers in terms of acting positively and with eagerness means in the interests of the company, while at the same time maintaining both professional and personal ethics.

The self-regulation literature suggests reasons why those with strong entrepreneurial-regulation would evaluate decision outcomes in this way. Higgins et al (Camacho et al., 2003; Freitas & Higgins, 2002; Higgins et al., 2003) have shown that people attach greater significance and value to decisions made in situations of regulatory fit, where “regulatory fit” means situations where the regulatory orientation and decision means suit the projected decision outcomes. In the case of entrepreneurial goals, the most suitable approach will typically be a promotion orientation and eagerness means (Brockner et al., 2004). This implies that those with strong self-regulation will tend to use eagerness means in the pursuit of positive attainment goals, as opposed to vigilance means in the

pursuit of avoidance goals. When acting from strong promotion pride with strong self-efficacy, entrepreneurs will typically employ such eagerness means with greater confidence and commitment. As a result, they will experience greater regulatory fit through goal pursuit and will tend to attach positive value to their decision outcomes. They will feel they acted rightly and used correct decision means.

In addition, as noted earlier, both promotion pride and entrepreneurial self-efficacy appear to be more strongly linked to self-realization goals and personal ethics (Bandura, 2001; Camacho et al., 2003). This implies that those with strong entrepreneurial-regulation will evaluate decision outcomes in terms of self-realization through the attainment of a stronger purpose. They will also evaluate the degree to which they met their own ethical standards in the pursuit of such goals. Therefore, those with stronger entrepreneurial-regulation may be more likely to evaluate decision outcomes in terms of values and ethics.

## **CONCLUSION**

This chapter has presented and integrated two sets of results. Firstly, it reported analysis of the survey data that measured regulatory pride and entrepreneurial self-efficacy among 30 entrepreneurs and a group of 30 managers. Statistical analysis suggested that two of the constructs – promotion pride and entrepreneurial self-efficacy – were associated among the entrepreneur group, but not among the managers. I noted that this result is supported by the literature. I then explained that based on the literature and the survey results, I ranked the entrepreneurs into three groups of strong, moderate and weak combinations of promotion pride and entrepreneurial self-efficacy, which was subsequently described as entrepreneurial-regulation.

Secondly, this chapter presented an extended analysis of the interviews that were conducted with the group of 30 entrepreneurs. I described how, after the initial thematic

coding and analysis of the interviews was complete, I ordered the interviews into strong, moderate and weak entrepreneurial-regulation groups, with each group containing 10 interviews. The chapter then turned to the results which showed important differences in decision making between the three groups. I reported findings about seven aspects of decision making: decision styles, career choice, opportunity risk, heuristics, heuristic bias, decision speed and the role of values and ethics.

Overall, the results suggest that decision making by entrepreneurs is a complex process and deeply contingent on personal and situational factors. Importantly, there appeared to be substantial within-group variation in terms of entrepreneurs' self-regulatory characteristics. Those with stronger entrepreneurial-regulation appeared to focus more on personal aspirations and positive attainment goals, and were more willing to take risks in relation to new opportunities. They also made faster decisions when they needed to, and relied more heavily on values and ethics in their decision making.

Overall, these findings suggest that self-regulation plays a complex role in decision making by entrepreneurs. That role involves multiple levels of processing, such as underlying psycho-social dispositions, motivation systems and situational response mechanisms. As a consequence, the findings of this thesis have implications for a range of scholarly debates and research programs. In the next chapter, I will discuss those implications in relation to the literatures on entrepreneurship, decision making and self-regulation.



## **CHAPTER 6:**

### **DISCUSSION OF EMPIRICAL FINDINGS**

#### **INTRODUCTION**

This thesis explores the role of self-regulation in decision making by entrepreneurs. As noted at the outset, the role of entrepreneurial cognition in decision making has received substantial attention in the recent literature. However, few researchers have investigated the role of multiple self-regulatory factors in these decision making processes, and even fewer have employed qualitative or mixed methods to do so. Rather, much of the literature has focused on singular self-regulatory factors, such as self-efficacy, within one dimensional models of decision making. At the same time, many studies have treated entrepreneurs as a homogenous group with respect to their cognitive and decision making processes. In contrast, this explores within-group variations among entrepreneurs and the multidimensional nature of their decision making processes. Moreover, the thesis employs pluralistic methods and theories, thereby exposing new opportunities for the development of theories about decision making by entrepreneurs.

The thesis contributes to the entrepreneurship literature in a number of ways. Firstly, it provides additional evidence of heterogeneity among entrepreneurs with respect to self-regulatory factors, reinforcing the argument put by others that prior studies in the field have been limited by assumptions of homogeneity (Busenitz et al., 2003; Davidsson, 2005; McKelvey, 2004; Sarasvathy, 2004a). The thesis thus challenges the externally focused boundary conditions that some researchers continue to draw, as they seek distinguish and defend the study of entrepreneurship in relation to other fields of study. In this respect, the thesis exemplifies the current trend towards greater theoretical complexity

and the contemporary search for multidimensional frameworks (e.g., Goss, 2005; Lichtenstein et al., 2006; McMullen & Shepherd, 2006).

Secondly, the thesis demonstrates the multidimensional nature of self-regulation and decision making by entrepreneurs, linking personal, historical, social and situational factors. Indeed, a person's self-regulatory characteristics develop through time in both their chronic and contingent forms. In contrast, much of the literature on personal factors in decision making by entrepreneurs has tended to assume isolated stable factors, such as individual personality traits or cognitive states (Baron & Ward, 2004). These limitations may be partly owing to habits of research design, in that few researchers have broken away from conventional quantitative or qualitative methods and embraced more pluralistic multidimensional approaches (Jennings, Perren, & Carter, 2005). In contrast, this thesis, by using mixed methods and multiple construct variables, demonstrates the potential benefits of embracing greater pluralism (cf., Baum et al., 2001).

Thirdly, the thesis contributes to the entrepreneurship literature by providing evidence which supports the view that the role of self-regulation in decision making by entrepreneurs is inherently contingent. The contingent nature of entrepreneurship has already been argued for by Sarasvathay (2001) and others (e.g., Ibeh, 2003; Steier, Chrisman, & Chua, 2004). More specifically, this thesis shows that decision making by entrepreneurs cannot be separated from the decision context in which actual decision making occurs. In particular, the findings suggest that situational factors influence the way in which entrepreneurs self-regulate goal setting and the selection of pursuit means in career choice, opportunity evaluation and opportunity exploitation, and in the evaluation of decision outcomes.

Whereas, many prior studies have reified or abstracted entrepreneurial cognition and decision making, for example, by assuming these processes could be explained

through the analysis of context independent variables averaged across large population samples (Bruyat & Julien, 2001; Busenitz et al., 2003). This kind of approach is also observed in applied social psychological research. However, whether intentionally or not, such approaches often obscure or dismiss important situational contingencies as outliers or mere statistical variance (Mischel et al., 2002).

Fourthly, the thesis makes a number of contributions to the literature regarding specific aspects of decision making by entrepreneurs. Those contributions relate to decision styles, career choice, opportunity risk, heuristics, the management of heuristic bias, decision speed and the role of values and ethics. I will discuss each area of contribution in greater detail later in this chapter. I will also discuss the study's contributions to the broader literatures on decision making and self-regulation. In summary, these various contributions are instances of the broader contributions already described. That is, they demonstrate the multidimensional, contingent nature of decision making and the role played by self-regulation. The thesis also demonstrates the need for greater methodological and theoretical pluralism and synthesis.

In the rest of this chapter, I shall discuss these empirical findings in greater detail and in relation to the propositions that were developed from the literature in Chapter 3. The discussion is divided into two major sections, mirroring the design of the thesis and the nature of its findings. First, I will discuss the findings from the survey component of the thesis. They include findings about patterns of self-regulation among entrepreneurs and managers. Second, I will discuss the findings that emerged from integrative analysis of the interviews with the survey results. At the end of this chapter, I will discuss the implications for future research and practice. The major implications relate to the specific topic of the thesis, namely the influence of self-regulation on decision making by entrepreneurs. In addition, I will suggest that the thesis has significant implications for the study of

entrepreneurship, decision making and self-regulation more broadly. In the penultimate section I will discuss the limitations of the thesis, and then finally conclude the thesis.

## **SURVEY FINDINGS**

As noted earlier, owing to the relatively small samples in this thesis, the survey component cannot be used to draw statistically meaningful conclusions about the general populations of entrepreneurs and managers. The thesis is exploratory and the findings are consequently tentative. Nonetheless, given that caveat, analysis of the survey data provided findings about the nature of self-regulation among the entrepreneurs and managers who participated in the survey.

### **Self-Regulatory Constructs**

As noted in Chapter 5, promotion pride (chronic promotion focus) was observed to be stronger than prevention pride among both entrepreneurs and managers. That difference was more marked among entrepreneurs who demonstrated weaker prevention pride as a group. However, Mann-Whitney tests showed that this difference was not statistically significant. Furthermore, the two constructs of promotion pride and prevention pride were not significantly correlated, confirming similar results found in other studies (Grant & Higgins, 2003; Higgins et al., 2001; Semin, Higgins, Montes, Estourget, & Valencia, 2005). Nonetheless, the descriptive statistics provide some support for those scholars who argue that entrepreneurs will typically possess stronger promotion focus compared to prevention focus (Baron, 2004a; Brockner & Higgins, 2001; Brockner et al., 2004). Overall, however, the results suggest that entrepreneurs are not significantly different from managers in terms of regulatory pride.

Entrepreneurial self-efficacy was slightly stronger among entrepreneurs compared to managers, providing some support to other studies which have reported similar results

(Chen et al., 1998; Scherer et al., 1989). Yet once again, Mann-Whitney tests showed this small difference was not statistically significant. This lack of significant difference between the two groups lends support to studies which find little difference between entrepreneurs and managers in terms of their self-efficacy (Krueger Jr, Reilly, & Carsrud, 2000; Vecchio, 2003). Hence, the overall findings of the thesis are inconclusive with respect to entrepreneurial self-efficacy when it is considered in isolation.

Despite the lack of any significant difference between entrepreneurs and managers in terms of their self-regulatory scores, Spearman correlations provided evidence of an association between promotion pride and entrepreneurial self-efficacy among the entrepreneurs, yet this association was not observed among managers. In addition, promotion pride appeared to be the dominant chronic orientation among entrepreneurs. The entrepreneurs also possessed weaker prevention pride compared to managers. While these results cannot be used to infer general conclusions about a wider population, they nonetheless reinforce arguments in the literature which suggests that promotion pride and entrepreneurial self-efficacy may be positively associated among entrepreneurs. Overall, however, the first proposition of the thesis, that *entrepreneurs' self-regulatory characteristics distinguish them from managers*, is only weakly supported.

### **Entrepreneurial-Regulation Groupings**

Noting the results of the survey analysis which suggested an association between promotion pride and entrepreneurial self-efficacy, and also noting supportive evidence in the literature, I derived a ranking of entrepreneurs based on their relative scores for promotion pride and entrepreneurial self-efficacy (that is, in terms of entrepreneurial-regulation). The combination of these self-regulatory factors suggests that entrepreneurs typically possess a chronic orientation towards positive attainment goals (promotion pride), as well as a sense of self-efficacy in the entrepreneurial task domain. That is, they tend to

approach new entrepreneurial tasks with relative eagerness, positive goals, confidence and commitment.

The combination of promotion pride and entrepreneurial self-efficacy also suggests that entrepreneurs possess 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. If so, then they will tend to 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. As noted earlier, leading scholars have called for studies which combine multiple self-regulatory constructs in this way (Higgins, 2002; Kanfer, 2005; Mischel & Shoda, 1998; Wood, 2005).

As I reported in Chapter 5, analysis of the interviews generated significant results covering many aspects of decision making. Overall, I found that entrepreneurs exhibited different decision making behaviors depending on their level of entrepreneurial-regulation. In most situations, those with strong entrepreneurial-regulation displayed a more complex and positive orientation in the following aspects of decision making: decision styles, career choice, opportunity risk, the use of heuristics, the management of heuristic bias, decision speed and the role of values and ethics in decision making. I will now discuss the implications that flow from each set of findings.

## **DECISION STYLES**

The results reported in Chapter 5 suggest that the stronger the entrepreneurial-regulation group, the greater the use of intuitive decision means. This trend was most explicit in relation to value judgments and ethical decisions, as well as aspects of career choice and the management of stressors in decision making. More implicitly, the observed equivalence of both systematic and intuitive decision styles in relation to opportunity

evaluation and exploitation was found to be contingent on the nature of the opportunities themselves. Even though entrepreneurs with strong entrepreneurial-regulation tended to pursue more challenging and risky opportunities (when compared to those in the moderate and weak groups) they did not use less intuitive decision means. In contrast, members of the moderate and weak groups relied more heavily on systematic decision means to analyze and mitigate opportunity risk.

These findings constitute a contribution to the entrepreneurship literature in a number of ways. Firstly, they reinforce once again the argument that entrepreneurs cannot be regarded as a homogenous group with respect to intuitive decision making (see Allinson et al., 2000). Similarly, the findings support those scholars who argue that entrepreneurs adapt decision styles depending on the nature of the decision making situation (Baron, 2004a), and provide new evidence to suggest that self-regulation plays a role in these adaptive processes. The findings also challenge the assumption that decision styles are inherent and invariant, and suggest instead the existence of significant within-group heterogeneity and situational contingency.

Secondly, the findings suggest that promotion pride and entrepreneurial self-efficacy influence the use of different decision styles and means, thereby supporting arguments that this should be the case (Baron, 2004a; Brockner et al., 2004; Wood et al., 2000). In particular, the findings suggest that those with stronger entrepreneurial-regulation use intuitive decision means as eager approach means, and are less prone to adopt systematic decision means in the face of negative opportunity risk. They also rely on intuition more frequently when making value-based decisions and in relation to the higher purpose of their entrepreneurial goals. In summary, therefore, the findings provide support for the third proposition, that *entrepreneurs' self-regulatory characteristics influence their decision making style.*

These findings also have implications for the general literatures on self-regulation and decision making. Regarding self-regulation, the findings imply that multiple self-regulatory factors are involved in the selection and adaptation of decision styles, and that these processes are also conditioned by situational factors. Therefore, the findings imply that decision styles are not invariant cognitive dispositions, as some studies imply (e.g., Hunt, Krzystofiak, Meindl, & Yousry, 1989; Scott & Bruce, 1995), but rather evidence of the situation-behavior dynamic which encompasses personality and social cognition (Mischel et al., 2002; Murtha et al., 1996).

In relation to the literature on decision making, the findings reinforce the behavioral approach to the analysis of decision making, rationality and risk. Whereas much prior research on these topics in the fields of strategic decision making and entrepreneurship assumed classically inspired benchmarks of systematic decision making, rationality and negative risk aversion, the findings reported here support those who reject such assumptions (e.g., Sadler-Smith & Badger, 1998; Sarasvathy, 2001; Thaler, 2000).

### **CAREER CHOICE**

Overall, the findings suggest that entrepreneurial-regulation is positively related to the nature of entrepreneurial career choice. Three major implications follow for the field of entrepreneurship. Firstly, some previous treatments of this topic have assumed that entrepreneurs are a homogenous group and that they will exhibit the same reasons for career choice irrespective of their different psycho-social makeup (e.g., Carter et al., 2003; Krueger Jr et al., 2000). This thesis joins others in throwing that assumption into further doubt (Das & Teng, 1997; Korunka et al., 2003; Scherer et al., 1989). The more original contribution of the thesis is to demonstrate that there are significant within-group



variations between entrepreneurs in terms of their self-regulatory characteristics, and that these variations appear to be associated with different reasons for career choice.

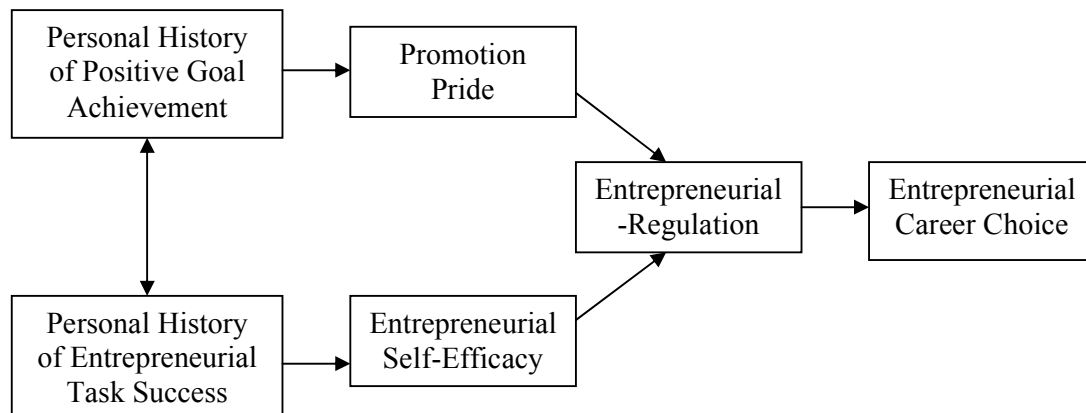
The study's second contribution on this subject is showing that personal history appears to play a complex role in the decision to become an entrepreneur. That is because both promotion pride and entrepreneurial self-efficacy are based on a person's history of goal achievement in general and in the entrepreneurial task domain. The findings reported here suggest that personal history and prior experience may have a deep and complex influence on career choice, reaching back into an entrepreneur's family history and psycho-social development (cf., Greve & Salaff, 2003). In contrast, previous studies have investigated personal history and professional experience in terms of personality traits and motivation systems (Miner, 1990) and in terms of prior role models (Scherer et al., 1989).

The third contribution regarding entrepreneurial career choice derives from the finding that those with strong entrepreneurial-regulation often referred to higher purpose, self-realization and even spiritual aspirations in relation to their career decision. This suggests that for some, being an entrepreneur is deeply related to their sense of self and primary life goals. For some entrepreneurs, that is, their career choice contributes to the construction and construal of their personal, social and spiritual identity. Importantly, the findings suggest that this deeper aspect of entrepreneurial career choice is fundamentally related to the development and functioning of self-regulation (Higgins, 2000b). To date, this has not received attention in the literature, although some have recommended that such research be conducted (Baron, 2004b). This thesis is one of the first to do so and its findings suggest that more research is warranted. In summary, therefore, the fourth proposition is supported. It proposed that *entrepreneurs' self-regulatory characteristics influence the decision to adopt an entrepreneurial career.*

It must be noted, however, that the thesis has not shown the degree to which entrepreneurial-regulation is an antecedent or consequent of choosing an entrepreneurial career. Elements of entrepreneurial self-efficacy, in particular, may well develop and strengthen over time as a person gains experience and a sense of master in that task domain. This developmental process will include an iterative feedback process, whereby future successful decision outcomes will reinforce a person's sense of promotion pride and sense of self-efficacy. This proposed process is depicted in the model of self-regulation and career choice shown in Figure 6. The model suggests that both promotion pride and entrepreneurial self-efficacy mediate the influence of a person's achievement history as an antecedent of career choice.

**FIGURE 6**

**Model of Entrepreneurial-Regulation and Career Choice**



## OPPORTUNITY RISK

Regarding opportunity risk taking by entrepreneurs, the thesis found substantial support for its fifth proposition, that *entrepreneurs' self-regulatory characteristics influence risky decision making about opportunities*. In terms of its contributions, the thesis adds to knowledge about risk taking in both the entrepreneurship and decision making literatures. Each deserves separate discussion.

### Implications for Entrepreneurship

Firstly, concerning research into entrepreneurial risk taking, the findings suggest that those with strong entrepreneurial-regulation regard risk as an inherent and acceptable feature of the long-term tasks associated with evaluating and exploiting challenging opportunities, rather than the immediate short-term task of opportunity evaluation itself. Whereas, those with weaker entrepreneurial-regulation tended to mitigate and minimize risk and consequently chose less risky opportunities. A number of implications flow for the field of entrepreneurship.

Firstly, in contrast to much prior research, the thesis once again suggests that entrepreneurs cannot be regarded as a homogenous group, and particularly in relation to risky decision making. The findings suggest that different levels of entrepreneurial-regulation appear related to markedly different approaches to risk taking. In particular, a sense of past success in risk taking as promotion pride, related to entrepreneurial strong self-efficacy, appears to encourage 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.

In other words, the findings suggest that a sense of past success in positive risk taking supports the framing of new opportunity evaluation 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. Past success of that kind also fosters stronger task self-efficacy, confidence and commitment to take opportunity evaluation 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 evaluation and greater propensity and confidence to seek such risks. At the same time, he or she will tend to perceive and manage the major negative exploitation risks associated with inherently more risky opportunities.

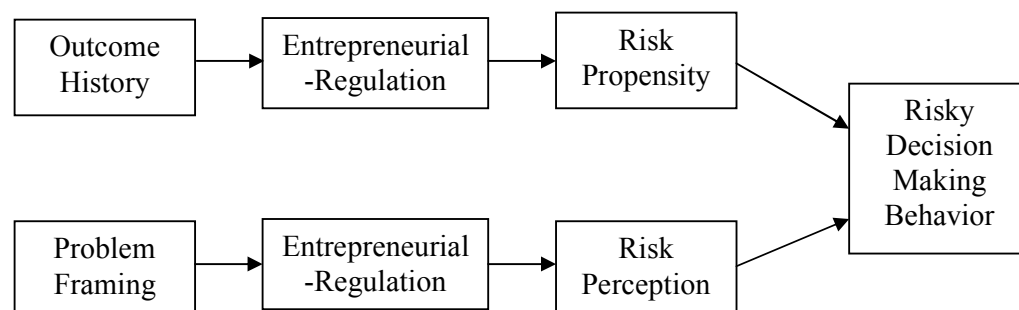
Alternatively, those with weaker entrepreneurial-regulation appear to perceive more of the negative downside risks associated with new opportunity evaluation. For that reason, they appear to be more conscious of the chance of incurring losses when evaluating opportunities, as opposed to the positive risks of attaining gains. As a result, they tend to show less propensity and confidence to seek such risks. At the same time, they 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 evaluation, the stronger the entrepreneurial-regulation, the more likely it is that an entrepreneur will perceive acts of omission as 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.

In relation to opportunity exploitation, the findings suggest that 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, the findings also suggest that such entrepreneurs will seek to avoid risks of commission and seek risks of omission. If these findings were validated using larger samples, then aspects of entrepreneurial-regulation would probably function as mediators in risk taking. Specifically, entrepreneurial-regulation would mediate outcome history as a determinant of risk propensity and risk framing as a determinant of risk perception. Figure 7 depicts this proposed set of relationships as a mediated model of entrepreneurial-regulation and risk taking, building on the model of risky decision making originally developed by Sitkin and Weingart (1995) that was discussed earlier in Chapter 2. Recall that Sitkin and Weingart argued for a more complex model of risk propensity and risk perception as significant mediators of risk taking. In particular, their studies showed the distinct effects of outcome history and problem framing as key determinants of risk propensity and risk perception respectively.

**FIGURE 7**

**Model of Entrepreneurial-Regulation and Risk Taking**



However, it must be stressed that these tendencies did not appear to be strictly exclusive. All three entrepreneur groups thought that opportunity evaluation 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. This finding is broadly supported by other studies into entrepreneurial risk perception and propensity, although few have investigated the influence of self-regulation in those processes (Das & Teng, 1997; Janney & Dess, 2005; Petrakis, 2005).

### **Implications for Decision Making**

As noted earlier, the decision making literature hosts a lively debate surrounding the classical Bayesian assumptions that still inform much research into risk taking. Some argue from a behavioral perspective that those assumptions have led to a distorted view of the risk taking process (cf. Schwartz, 2002). Others – often from an economics background – still defend vestiges of the classical ideal. This thesis makes a contribution to that debate. It does so in favor of the behaviorists, by suggesting that classical assumptions have skewed the analysis of risk taking by neglecting multidimensional self-regulatory factors and related situational variables. In contrast, this thesis demonstrates that entrepreneurs have different risk responses and outcome preferences based on their self-regulatory orientations in relation to specific problem situations. That is, they can choose to act or not act in risky decision making situations, and they can do so from either a promotion or prevention orientation.

This contribution to the entrepreneurship and decision making literatures poses a number of implications for future theory development and empirical research. As noted earlier, much previous research has assumed that positive risk frames refer to gains and negative frames to losses. At the same time, many researchers have assumed that the psychology of risk taking is relatively consistent across situations and does not

significantly vary from person to person. Like others, this thesis questions those assumptions (see Higgins, 2000a; Kluger et al., 2004). The findings suggest that self-regulatory factors underpin important patterns of variance which have been ignored in much prior research into risky decision making.

In addition, the findings suggest that greater attention should be paid to situational factors in risk taking. Too often, risk taking has been studied experimentally using contrived scenarios that are devoid of situational context (Bazerman, 2001; Williams, Zainuba, & Jackson, 2003). In contrast, the study of psycho-social factors in risky decision making – such as regulatory pride and self-efficacy – requires attention to complex situational variables. Researchers into entrepreneurial cognition and risk taking, in particular, should therefore incorporate such elements into future research designs. This is equally important for research into other domains such as organizational and management decision making, where contextual factors also appear to play a major role in shaping risk perception and risk propensity (March & Shapira, 1987).

## HEURISTICS

The findings reported in Chapter 5 provide support for the sixth proposition, that *entrepreneurs' self-regulatory characteristics influence the use of heuristics in decision making*. In fact, the findings go further and suggest that self-regulation may be a fundamental factor in heuristic decision making more broadly, and especially in the management and mitigation of potential bias and cognitive error. Thus, the findings also provide support for the seventh proposition, that *entrepreneurs' self-regulatory characteristics influence the cognitive errors due to extreme bias in decision making*.

By showing support for both propositions, the thesis has implications for each of the three literatures discussed in this thesis: entrepreneurship, decision making and self-

regulation. To begin with, most prior entrepreneurship research has tended to treat heuristics as a single category of decision means and to treat entrepreneurs as a homogenous group when using heuristics. This thesis suggests that both assumptions are flawed. In contrast, the thesis demonstrates within-group variations in the use of heuristics by entrepreneurs. Most notably, those in the strong entrepreneurial-regulation group tended to use heuristics related to perceived strategic fit when evaluating opportunities. Whereas those in the weak and moderate groups tended to select opportunities using heuristics based on their knowledge of the relevant market. While none of the groups made frequent use of heuristics in relation to opportunity exploitation.

The implication to be drawn for future research is that any attempt to explain the use of heuristics by entrepreneurs must accept a high degree of within-group heterogeneity and situational contingency. In particular, future studies should distinguish between the different heuristics used in relation to opportunity evaluation and exploitation and how the use of those heuristics relates to multiple self-regulatory factors.

The thesis has comparable implications for research into the self-regulation of heuristics within the field of decision making more broadly defined. Only a few studies have investigated the influence of regulatory orientation and self-efficacy on heuristics in decision making (e.g., Cervone & Peake, 1986; Kluger et al., 2004) and none have explored the potential association of the two. The findings of this thesis suggest that these topics warrant far greater attention. The findings suggest that a person's chronic regulatory orientation, when related to self-efficacy within a task domain, influence the person's readiness to employ heuristics in decision making. For example, when acting from self-efficacy and a chronic promotion orientation, entrepreneurs appear to employ heuristics to make longer term, more risky decisions about new opportunities. At the same time, they



appear to be aware of the downside risks associated with heuristic bias and many take deliberate self-regulated actions to minimize the risk of cognitive error.

In contrast, as noted earlier, much of the decision making literature assumes that heuristics are inherently prone to bias and a cause of cognitive error in decision making. The findings support those who argue to the contrary, by showing that a person's achievement history, level of domain expertise and experience as a decision maker, may have major influences on their use of heuristics. Regarding the field of entrepreneurship, in particular, the findings show that the dynamics of the opportunity cycle and the level of a person's self-regulatory characteristics play a major role in their use and management of heuristics. Experiments in laboratories, using contrived choice scenarios, cannot be expected to explain such complex features of the individual-opportunity nexus. In fact, theories based upon that kind of non-contextual evidence appear to have skewed earlier studies of entrepreneurial decision making, by framing heuristics as inherently flawed.

### **DECISION SPEED**

As noted earlier, decision speed is a major topic of interest in the strategic decision making (Brown & Eisenhardt, 1997) and entrepreneurship literatures (Lumpkin & Dess, 2001; Talaular et al., 2005). It is also a significant topic in the literature on cognitive factors in adaptive decision making and heuristics (Förster et al., 2003; Gigerenzer, 2000; Payne & Bettman, 2001). The thesis contributes to all those literatures by demonstrating complex, within-group variations regarding the influence of self-regulation on decision speed. The findings therefore support the literature which foreshadows such influences (see Grant & Higgins, 2003; Thunholm, 2004). In fact, this thesis is one of the first studies to report empirical findings that demonstrate those effects. Overall, therefore, the thesis

provides support for the eighth proposition, that *entrepreneurs' self-regulatory characteristics influence decision speed*.

The findings suggest that those with strong entrepreneurial-regulation are more likely to make rapid decisions and to do so for longer-term strategic reasons. Moreover, they tend to use more heuristics in doing so and especially the “strategic fit” heuristic. In that way, their confident use of heuristics allows them to act quickly in dynamic, fast-paced decision making situations. Their behavior was comparable to decision making in stressful situations, such as medical emergencies and military conflict (Hammond, 2000). The findings also endorse Gigerenzer’s (2001) argument that heuristics can be used to make effective decisions without inherent bias and error.

On the other hand, entrepreneurs with weaker entrepreneurial-regulation appeared more sensitive to time pressures when making decisions. They preferred to take their time and especially when making important strategic decisions. They pushed back more strenuously against time pressure, saying they would sleep on it, seek out additional information, ask trusted advisers and assess the risks in detail. Whereas, those in the strong group, recognized the necessity to make fast decisions when they encountered a desirable strategic opportunity. In terms of acting from promotion focus, they were more willing to risk a loss in order to avoid missing a strategic gain.

These findings also broadly agree with studies by Higgins et al (2003), showing that as people move closer to the goal of completing a task, decision speed increases and accuracy decreases for participants with a promotion focus, whereas speed decreases and accuracy increases for participants with a prevention focus. Speed and accuracy decisions are thus influenced by the strategic inclinations of participants’ regulatory focus. Decision speed is also influenced by a person’s self-concept. For instance, if an entrepreneur possesses a positive self-concept, that induces creativity and faster decision making in the

service of maximizing hits, while diminishing analytic thinking (Seibt & Forster, 2004; Wood et al., 2000). The findings suggest that that is true of entrepreneurs with strong entrepreneurial-regulation.

Finally, decision speed is recognized as a significant factor in strategic decision making generally (Mintzberg et al., 1998). This thesis suggest that a better understanding of the influence self-regulation on managerial cognition could provide new explanatory models and practical techniques to improve effective strategic decision making in the fast paced business environments which now confront entrepreneurs and managers alike (Brown & Eisenhardt, 1997).

## **VALUES AND ETHICS**

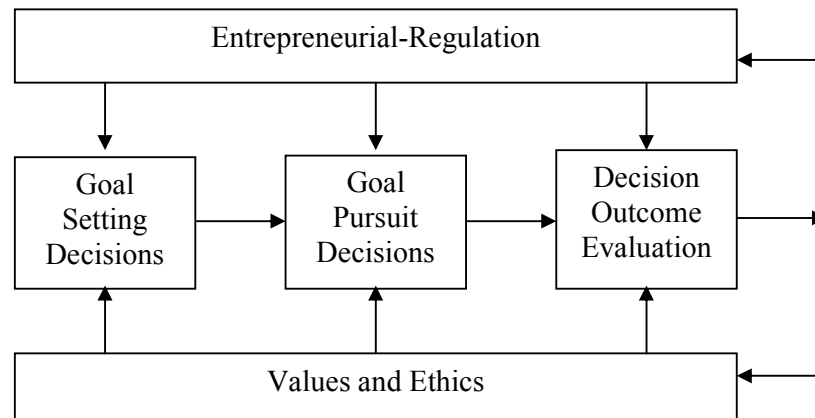
The findings demonstrate that values and ethics play a significant role in decision making by entrepreneurs with strong entrepreneurial-regulation, although that was rarely the case among those in the moderate and weak entrepreneurial-regulation groups. At a more detailed level, the findings demonstrate that different types of values and ethical standards are related to different aspects of decision making, and at least partly dependent on the relative nature and strength of entrepreneurial-regulation. Once again, the thesis also finds evidence of multidimensional processes linking personal, cultural and organizational value systems to situational contingency, the explanation of which will demand a more pluralistic approach to reach theoretical synthesis on this topic.

A number of contributions to knowledge emerge. Firstly, strong entrepreneurial-regulation appears positively related to the reliance on values and ethics when exercising intuitive decision means in relation to goal setting. This pattern was especially clear regarding opportunity evaluation and exploitation, and especially when issues of trust were involved. This finding has not been reported in the prior literature and it suggests a more

complex role for values and ethics in decision making about opportunities. Members of the strong group also referred to values and ethical standards when explaining their career choice, personal motivations and personal history. This general finding has been reported previously (Carter et al., 2003), although not in relation to the multiple self-regulatory factors explored in this thesis.

A number of those in the strong group also spoke about the importance of values and business ethics when they discussed goal pursuit means and their sense of self as an entrepreneur. Many of the same entrepreneurs referred to values and ethics when they evaluated the outcomes of their decision making and their own performance as decision makers. Other researchers have reported similar findings, although they were unrelated to specific self-regulatory mechanisms (Gilbert Jr, 2002; Morris et al., 2002; Newbert, 2003). Overall, therefore, the findings provide support for the ninth proposition, that *entrepreneurs' self-regulatory characteristics influence the use of values and ethics in decision making.*

In fact, this thesis is one of the first studies to provide evidence of an association between entrepreneurial values, business ethics and specific self-regulatory factors. That association appears to involve a consistent feed-forward and feedback process whereby self-regulation, values and ethics influence the three stages of goal-directed decision making, those stages being goal setting, goal pursuit and outcome evaluation. This process is depicted in Figure 8, which shows a model of entrepreneurial-regulation, values and ethics in decision making. This model is a variant of the general model of self-regulation and decision making depicted in Figure 2 on page 58.

**FIGURE 8****Model of Entrepreneurial-Regulation, Values and Ethics in Decision Making****Decision Ends and Means**

The literature on self-regulation and decision making has established that values and ethics play a key role in goal setting and in defining the ends that people seek to achieve (Bandura, 1997; Higgins, 2000a). People typically select goals and ends which reflect and reinforce the personal and social values which they hold. Values and ethics therefore interact with self-regulation and decision making in terms of self-directed goal pursuit means. That is, the way a person self-regulates thought and behavior in goal pursuit will be reflective of their values and ethical standards.

In particular, research shows that a person's regulatory orientation will influence the values they adopt in goal setting (Camacho et al., 2003; Hamilton & Biehal, 2005). People with strong promotion pride, in particular, will tend to set goals relating to the attainment of gains, as opposed to the avoidance of losses. Such promotion goals reflect the values of ideal self-states, whereas prevention goals reflect the values of ought self-states. Research has also shown that values and ethics influence the decisions people make

in goal pursuit. Values underpin the social and personal purpose of goal pursuit, while ethical standards guide the types of decision means that people employ in pursuit of their goals (Vancouver, 2000).

The findings of this thesis support these predictions with respect to goal setting by entrepreneurs, thereby making another contribution to the field of entrepreneurship. That is, the findings provide evidence that entrepreneurs with stronger entrepreneurial-regulation appear more aware and reliant on values and ethics, and invoke values and ethical standards more frequently in their decision making. This contribution is further deepened by the finding that the values and ethical standards they employed were typically about positive gains and future growth for themselves as individuals as well as their companies. Their stronger sense of entrepreneurial self-efficacy then strengthened their sense of confidence and commitment to pursue those values and ethical standards in decision making.

In contrast, much prior research on these topics has assumed that the primary goals for entrepreneurs are standard across the population. Indeed, that assumption is implicit in attempts to build general theories of opportunity recognition, evaluation and exploitation as defining features of the entrepreneurial process (Sarasvathy, 2002). Making that assumption, however, implies that such goals are uniformly adopted by entrepreneurs for the same reasons, regardless of personal and situational variation. Like other studies, the findings of this thesis suggest that such a perspective requires refinement (Ireland et al., 2005; Shane & Venkataraman, 2000b). In fact, the findings suggest that desired outcome value may vary significantly depending on entrepreneurial-regulation. Those with strong entrepreneurial-regulation may seek more positive outcomes related to their strong personal and social values and high ethical standards, while those with weak

entrepreneurial-regulation may pursue goals which are less related to higher values and ethics.

Next, the thesis makes a contribution by showing the relationship between values, ethics and decision means. As noted earlier, the broader literature on self-regulation has already shown that self-regulatory characteristics influence the means by which goals are pursued and decisions made (Boekaerts et al., 2000; Camacho et al., 2003). This thesis provides novel evidence of such a relationship among entrepreneurs. In particular, the findings suggest that entrepreneurs with strong entrepreneurial-regulation tend to use values and ethics more often in relation to intuitive decision means, as opposed to systematic decision means. At the same time, those with strong entrepreneurial-regulation appeared more likely to experience a sense of regulatory fit because their positive goal orientation corresponded to their use of eagerness means in decision making. This finding expands previous research into these topics by providing new evidence about the association of values, ethics and self-regulatory factors in the selection of decision means (cf., Baron & Ward, 2004).

### **Personal Values and Ethics**

The findings also showed that entrepreneurs with strong entrepreneurial-regulation associated decision making with more personal values and aspirations. For some of them, entrepreneurship was a journey of self-discovery and central to their sense of self. Hence, the values they espoused tended to be more independent and private in nature, rather than interdependent and communal. In fact, the literature suggests that such a pattern is to be expected from people who act from a chronic promotion focus and possess a strong sense of domain self-efficacy (Bandura, 2001; Lee et al., 2000). However, this thesis is the first to demonstrate such a finding regarding entrepreneurs.

This finding has wider implications for the literature on values and ethics in decision making. As I explained earlier in the review of the relevant literature, scholars typically divide the realms of values and ethics into social, organizational, relational and private spheres. Most questions of organizational values and business ethics are then seen in terms of the complex interplay between, on the one hand, a manager's obligations towards social and organizational values and ethical standards, and on the other hand, their private personal values and ethics. Dilemmas and conflicts are then said to arise as these different sets of different values and ethical standards come into conflict. Decision making takes place in the context of such conflict and managers often need to make trade-offs and compromises. The findings of this thesis suggest that any explanation of such value trade-offs and ethical compromises should take into account the complex self-regulatory orientations of individuals, and how those orientations trigger decision behavior in particular inter-personal and social contexts.

Some scholars of entrepreneurship have considered this general issue of values and ethics as features of contingent decision making. However, the results to date are inconclusive, and questions remain about whether and to what extent entrepreneurial decision making relies on private and/or organizational values and ethics in situations of conflict (Clarke & Aram, 1997; Morris et al., 2002). This thesis suggests that those patterns of decision making are significantly dependent on self-regulatory factors. In particular, a robust system of values and ethical behavior was apparent among those with strong entrepreneurial-regulation, yet largely absent among those with weaker self-regulation.

These findings have additional implications for the entrepreneurship literature. It may be that extreme contraventions of social values and ethics are more likely among some of those with strong entrepreneurial-regulation, because they typically possess a more independent, eager goal orientation. In contrast, greater compliance with social



values and ethical standards could be expected from those with weaker entrepreneurial-regulation, because they possess a less independent, more vigilant goal orientation. That is, those with weaker entrepreneurial-regulation may display a stronger tendency towards prevention pride in their self-regulatory makeup, even though promotion pride may still dominate. Assuming this to be the case, then concern about unethical behavior by a small but notable group of entrepreneurs should prompt scholarly attention on the role of self-regulatory factors in value-based decision making and the resolution of ethical conflict. Such research may uncover whether strong entrepreneurial-regulation, coupled with a strongly independent self-construal and commitment to private ideals, may incline some entrepreneurs to more frequent contravention of socially accepted ethical norms, that is, to unethical behavior.

### **Concepts of the Good**

Despite the potential for unethical behavior discussed in the previous section, none of the participants in this thesis indicated they would behave in such a fashion. In fact, some members of the strong entrepreneurial-regulation group displayed a strong sense of social responsibility as an aspect of their personal value system (cf. Joyner et al., 2002). They stated their personal commitment and adherence to strong social values. Even though their most fundamental values were internally oriented and private, they still had a strong commitment to the social good. A number explained their career decision and subsequent life as an entrepreneur had been partly motivated by a sense of altruism. This was expressed in terms of creating social and economic value, such as providing jobs, building social capital and solving significant social problems. These findings agree with those who have argued in favor of entrepreneurial altruism in opposition to the populist stereotype of entrepreneurial greed (Brenkert, 2002; Velamuri, 2002).

Importantly, however, the members of the strong group who advocated entrepreneurial altruism did so largely in terms of personal self-realization. This reflects the deep role played by self-regulation in goal-oriented decision making. That is, self-construal is widely viewed as a core component of self-regulation (Baumeister, 1996; Lee et al., 2000), and those with strong entrepreneurial-regulation could therefore be expected to impart more intense aspects of self-realization into their decision making behavior. Empirical evidence of this process among entrepreneurs constitutes another contribution to the literature.

Finally, the thesis contributes to the literature on trust in decision making by entrepreneurs. Once again, entrepreneurial-regulation was found to play a deep and complex role that has not been identified previously. Entrepreneurs in the strong group showed a greater readiness to trust in themselves and others. Furthermore, they did not rely as much on social or cultural factors in forming judgments of trust. In that way, they exhibited the independent self-construal that is typical of those with chronic promotion pride, as well as the self-confidence possessed by people with high domain self-efficacy. Similarly, entrepreneurs with strong entrepreneurial-regulation relied on trust to confirm their gut feelings and intuitions, to avoid making bad decisions, and as a validation of their own values and sense of purpose. In that sense, their feelings of trust were oriented towards their independent sense of self, rather towards interdependent relationships.

## **SUMMARY OF FINDINGS**

The contributions and implications of this thesis derive from its findings regarding the role of self-regulation in decision making by entrepreneurs. Indeed, the thesis makes contributions and poses implications for all three bodies of literature which it covers. Firstly, regarding entrepreneurship, the findings suggest that entrepreneurs possess self-

regulatory characteristics which are not uniform in strength or functioning, but indicative of within-group distinctions and heterogeneity. Those findings reinforce the arguments of other scholars who question the search for universal stable qualities of entrepreneurial cognition and decision making behaviour, and search for adaptive process models instead (Busenitz et al., 2003; Davidsson et al., 2001; Gartner, 2001).

Secondly, regarding decision making, the thesis shows that self-regulation plays a significant and complex role in decision making by entrepreneurs, and by implication, in decision making within other domains. In summary, the stronger an individual's entrepreneurial-regulation, then the more likely he or she is to make more positive goal-oriented, risky, heuristic, faster and value-based decisions. Notably, the findings suggest that risk perception and risk propensity can vary depending on an entrepreneur's chronic regulatory orientation and sense of domain self-efficacy. When considered more broadly, these findings suggest that the same considerations may warrant inclusion in general theories of self-regulation and risk taking.

Different levels of entrepreneurial-regulation were also found to incline people towards different patterns of heuristic usage. Those in the strong group used heuristics more frequently and in combination, often enabling them to be more adaptive and faster in decision making about opportunity risk. In contrast, those with weaker entrepreneurial-regulation appeared to use heuristics less frequently, and were more reliant on systematic approaches to decision making. Overall, the findings suggest that the widespread scholarly focus on heuristics as a source of cognitive error among entrepreneurs is misplaced. On the contrary, many appeared aware of the potential cognitive errors involved in heuristic decision making and took deliberate steps to mitigate those risks. Overall, therefore, the second and most general proposition of the thesis is supported across range of important

areas of decision making by entrepreneurs. It proposed that, *entrepreneurs' self-regulatory characteristics play a significant role in their decision making.*

In addition, the thesis also makes a number of contributions to ongoing debates in the fields of decision making and self-regulation, and especially in relation to issues of risk taking and the use of heuristics. The thesis makes a number of minor contributions to the self-regulation literature as well. These contributions stem from the findings which suggest that regulatory pride and self-efficacy may together play a complex and important role in decision making within specific person-situation contexts.

In summary, across all three bodies of literature, the thesis makes a number of original contributions towards the development of new multidimensional, pluralistic and synthesizing theories about self-regulation and decision making, and especially in relation to decision making by entrepreneurs. The thesis also contributes towards a deeper understanding of the inherent situational contingency of human cognition and behavior. The findings imply that future research on the specific questions addressed in this thesis should consider these thematic trends and question some of the long-standing assumptions about the homogeneity of decision making behaviors in particular. In doing so, future researchers should also employ a greater variety of methods, allowing them to dig more deeply and widely into the complexities of these phenomena.

### **IMPLICATIONS FOR FUTURE RESEARCH**

The findings discussed in this chapter imply that self-regulation in decision making by entrepreneurs should be viewed as a complex multilevel process. Importantly, entrepreneurs appear to be heterogeneous with respect to the self-regulatory characteristics of promotion pride and entrepreneurial self-efficacy. Moreover, they also appear to differ in terms of the role which these self-regulatory factors play in decision making. Indeed, no

one set of variables or factors appears sufficient to explain these processes. Other cognitive and personality variables may also warrant inclusion in future research. Consequently, the thesis implies that future research into decision making by entrepreneurs should seek to incorporate multiple levels and dimensions of human and situational factors (cf. Davidsson, 2005; Low, 2001). In fact, the same approach has been recommended for research into human personality and social cognition generally (cf. Mischel & Shoda, 1998).

The findings of the thesis also suggest that entrepreneurs may be more similar to senior managers in terms of their self-regulatory characteristics and decision making behaviors. As a consequence, future research should focus less on the differences between entrepreneurs and managers as distinct groups, and more on their common attributes and experiences, as well as within-group heterogeneity (Sarasvathy, 2004b). For example, the findings suggest that it may be more important to explore within-group heterogeneity among entrepreneurs by comparing the self-regulatory characteristics and decision making behaviors of “expert,” “habitual” and “novice” entrepreneurs, or by comparing entrepreneurs with other groups that are more dissimilar (cf. Davidsson et al., 2001).

Another implication of the thesis for future research is that entrepreneurial decision making appears to be inherently situational. Scholars of naturalistic and behavioral decision making have made this point repeatedly, arguing that people make actual decisions in contingent situations, not in laboratory settings (Connolly & Koput, 1997; Hammond, 2000). This thesis reinforces that perspective with regard to decision making by entrepreneurs. It has shown that decision making behaviors vary depending on the nature of the decision task, the self-regulatory orientation best suited to the task, and the idiosyncratic responses of entrepreneurs to such situations. Future research in the area should therefore explore the situational configurations that contextualize key

entrepreneurial decisions, such as opportunity evaluation and exploitation. In order to do that, researchers will need to employ more pluralistic research methods, such as the mixed methods research design adopted in this thesis. Future research on these topics would also benefit from testing within and between group differences using experimental or simulation-based methods, such as think-aloud techniques. Indeed, as others have noted, research into entrepreneurship has been overly dominated by relatively narrow approaches to research design and data gathering techniques (Bruyat & Julien, 2001; Davidsson & Wiklund, 2001b; Gartner & Birley, 2002b; Mitchell et al., 2004). Few have adopted methods which enable them to investigate the deeper complexities, multiple levels and situational contingencies of entrepreneurship. The findings of this thesis suggest that more should do so.

In particular, future researchers should employ methods which combine both qualitative and quantitative techniques, and which explore the interaction between both individual and organizational decision processes. This thesis has partly fulfilled that injunction, although it too is limited. For example, the thesis does not explain the degree to which the factors combined in entrepreneurial-regulation are antecedents or consequents of entrepreneurial experience. Yet these questions are significant. As an antecedent, entrepreneurial-regulation may help to explain entrepreneurial career choice. As a consequent, it may help to explain why certain individuals succeed while others fail in entrepreneurial pursuits. Future research should therefore seek to test whether or not entrepreneurial-regulation is a general characteristic of all entrepreneurs, and if so, how it evolves over time and what other cognitive and personality variables may be associated with it.

Regarding future research into entrepreneurial decision making, the findings support the view that classically inspired assumptions have skewed the exploration of

entrepreneurial risk taking by neglecting psycho-social factors and situational variables. In particular, many prior studies fail to recognize that people have different risk responses and outcome preferences based on their self-regulatory orientations. Further research is therefore warranted into the positive and negative risks associated with opportunity evaluation and exploitation, and how those distinctions relate to self-regulatory characteristics of entrepreneurs. This research could form part of a broader enquiry into the role of regulatory focus in risk taking, and especially in relation to risk perception and risk propensity.

The findings of this thesis also suggest that future researchers should question deeply held assumptions about the negative impact of heuristics on entrepreneurial decision making. Instead of assuming that heuristics are inherently prone to extreme bias and a source of cognitive error, future studies should seek to explore further the findings reported here. Research should focus especially on the role that heuristics play in enabling entrepreneurs to make effective rapid decisions, as well as the role of values and ethics in heuristic decision processes. Research into these topics will also require more complex synthetic approaches. The outcome is likely to be more complex models of entrepreneurial decision making and the role played by self-regulation.

Similar implications can be drawn for future research in the fields of self-regulation and decision making. Much prior research in those fields has assumed that positive goals and risk frames refer to gains and negative goals and frames to losses. At the same time, many researchers have assumed that the psychology of risk taking is relatively consistent and that potential sources of heuristic bias, such as overconfidence or affect intrusion, do not significantly vary from person to person. The findings suggest that those assumptions are too narrow. Different self-regulatory factors appear to underpin important patterns of variance which have been ignored in much prior research into the role of self-regulation in

decision making. Future research should seek to address that gap (see Higgins, 2000a; Kluger et al., 2004).

Situational factors also require greater attention. Too often, decision making and risk taking has been studied experimentally using contrived scenarios that are devoid of situational context (Bazerman, 2001; Williams et al., 2003). In contrast, the study of psycho-social factors in risky decision making – such as regulatory pride and self-efficacy – requires attention to complex situational variables. Researchers should therefore incorporate such elements into future research designs. This is important for research into specific task domains such as organizational and management decision making, where contextual factors appear to play a major role in shaping risk perception and risk propensity (Hambrick, Finkelstein, & Mooney, 2005; March & Shapira, 1987).

### **IMPLICATIONS FOR PRACTICE**

Future research of the kind described in the previous section could open up greater opportunities for the practical management of decision making within entrepreneurial contexts. For example, instead of assuming that risk perception and risk propensity are more or less stable and fixed as either organizational or personal attributes, social cognitive strategies could be employed to alter risk taking behaviors. Given that self-regulatory attributes such as regulatory focus and regulatory pride can be primed situationally, then by making appropriate organizational and situational interventions, people may be led to adopt more or less risky decision responses in particular problem situations (Higgins & Spiegel, 2005). That is, they could be primed to act from either a promotion or prevention orientation. In addition, it is already known that self-efficacy can be improved by education, training and experience (Bandura, 1997).



Using these techniques, it could be possible to identify those who are more suited to an entrepreneurial career. In addition, the enhancement of relevant social cognitive and self-regulatory skills could be incorporated into entrepreneurship education and training programs. Indeed, some curricula already focus on entrepreneurial self-efficacy (Béchar & Grégoire, 2005). The findings of this thesis suggest that attention should be paid to other self-regulatory characteristics, such as regulatory orientation, as well as the association between different self-regulatory factors. Similar techniques could also be adapted to enhance the self-regulatory characteristics and decision making performance of entrepreneurs once they have chosen that career.

Other practical implications flow from the findings as well. For example, investors and founders of new businesses may be able to assess and strengthen the use of values and ethics in decision making. By enlightening entrepreneurs to their own dispositions, strengths and weaknesses, they could encourage the adoption of better self-management strategies in dealing with value choices and ethical conflict. In this way, those responsible for the governance of young firms could improve the ethical climate and quality of decision making.

Finally, the founders and senior managers of young firms could be encouraged and supported to strengthen their awareness and management of their own self-regulatory characteristics in order to improve their skills in speedy and heuristic decision making, and especially in relation to the management of heuristic bias in decision making under pressure. The literature on self-regulation and decision making cited above already contains techniques that could be adapted to accomplish many of these goals.

## LIMITATIONS

Given the non-random, relatively small samples used in this study, the findings of this thesis cannot be used to make any claims about the general population of entrepreneurs and managers. That is typical of qualitative studies. 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. That is typical of case studies. On the other hand, by using a mixed method multiple case study approach, the thesis was able to explore its research questions in depth and in greater detailed.

Another limitation of the thesis relates to the comparison of the entrepreneur and manager samples. The sample of managers includes a range of different levels of responsibility, some being junior with operational roles, others more senior with strategic responsibilities. However, as suggested by Allinson, Chell and Hayes (2000), the cognitions of senior executive managers may be more similar to entrepreneurs and less similar to junior managers who do not have strategic management responsibilities. Thus, a pattern of self-regulation similar to that observed among entrepreneurs may also occur among senior executives, yet be absent among junior managers. However, even if that is shown to be the case, it would not negate the significance of this study's findings regarding entrepreneurial-regulation. Rather, it would suggest additional similarities between entrepreneurs and senior executives.

A further limitation of the thesis is that it employs only two pre-existing constructs borrowed from theories of self-regulation and omits others. A general study of the phenomenon should explore theories and measures of self-regulation more broadly, although this is currently hampered by the general lack of integrated models of self-regulation (Zeidner et al., 2000). In addition, given the relative small samples used in this study, and its reliance of self-report data, the results do not support generalizability.

Nevertheless, the use of pre-existing survey instruments ensured sufficient reliability and construct validity for the measures of regulatory pride and entrepreneurial self-efficacy.

Finally, this thesis is the result of efforts by a single researcher. Despite diligent adoption of best research practice at every stage, the fact remains that this is a limitation. It entails a stronger risk of researcher bias in a number of ways. This risk was partly mitigated by the selection of mixed methods, which allowed for a more expansive body of data and analysis. It was further mitigated by transparent sampling techniques, consistent research protocols throughout and by taking deliberate steps to protect against coding bias during analysis of the interview data.

## **CONCLUSION TO THE THESIS**

Life as an entrepreneur is both a personal and social journey. At the personal level, it calls for a substantial commitment of time and energy over extended periods of time. Indeed, for some, it is nothing less than a life commitment. Being an entrepreneur also demands persistent cognitive engagement with decision making in uncertain and dynamic environments. In doing so, entrepreneurs need to manage and self-direct their cognitive resources using skills of self-regulation. This thesis has investigated those processes. It sought to identify the role which self-regulation plays in decision making by entrepreneurs.

As a social journey, being an entrepreneur entails constant engagement within uncertain dynamic environments. These environments are characterized by emergent markets, complex networks, new organizational forms, as well as conflicting cultural and ethical systems. It is within such environments that entrepreneurs set and pursue challenging goals. In meeting these challenges, entrepreneurs must employ a range of skills, including social cognitive self-regulation. This thesis investigated decision making by entrepreneurs under such conditions.

To guide the thesis, the first research question I posed was this: do entrepreneurs possess a distinctive pattern of self-regulation compared to managers? Overall, the findings suggested that they do not. However, there was some evidence for an association between promotion pride and entrepreneurial self-efficacy among entrepreneurs, as suggested by the literature. To explore these factors more deeply, I transformed the survey results regarding promotion pride and entrepreneurial self-efficacy using mixed method techniques, thereby deriving a qualitative ranking of the entrepreneurs in terms of their self-regulatory characteristics.

The thesis then proceeded to investigate what role self-regulation might play in specific areas of decision making by entrepreneurs. The findings suggested that self-regulation does indeed play a role in numerous ways. However, the influence of self-regulation varied among entrepreneurs, depending on the relative strength of their self-regulatory characteristics in specific decision making situations. These findings highlighted the heterogeneous nature of entrepreneurs as a group and the need to recognize and explore their within-group differences.

The thesis produced a number of original contributions to knowledge. The thesis found that self-regulation appeared to play a significant role in entrepreneurial career choice, risk taking, heuristic decision making, and the management of heuristic bias. Self-regulation also appeared to be important in making fast decisions and in the use of values and ethics in decision making. Thus, I claimed to make a number of original contributions to knowledge regarding some of the most critical and problematic aspects of decision making by entrepreneurs.

At the same time, the thesis uncovered evidence about the broader role of self-regulation in decision making. These findings constituted contributions to the literatures on self-regulation and decision making in general. In particular, the findings suggested that

self-regulation may play a systematic role in the use of heuristics and the management of heuristic bias. The findings also suggested that self-regulation may be deeply related to risky decision making, to decision speed and to the role of values and ethics in decision making.

These wider contributions reflect the fact that the field of entrepreneurship is located at the intersection of other fields of enquiry in management studies and social science. Research into entrepreneurship is thus constantly infused by new theories, constructs and questions that challenge attempts to formulate strict boundary conditions for the field. Consequently, while the study of entrepreneurship may not stand so clearly alone, as do some other areas of management studies, it inhabits a rich and invigorating location. Situated at the confluence of numerous disciplines, entrepreneurship constantly borrows and has the potential to give much back in return. This thesis was conducted in that spirit of collaborative exploration.

## APPENDICES

### APPENDIX A: PARTICIPANT CONSENT LETTER

Dear,

Research Project on Decision Making by Entrepreneurs

You are invited to participate in a study of the decision making processes of entrepreneurs. The purpose of the thesis is to explore the different decision making styles and skills employed by entrepreneurs and to understand how such different styles and skills influence the outcomes of decision making itself.

The thesis is being conducted by Mr Peter Bryant, who is currently a doctoral student at the Macquarie Graduate School of Management (MGSM) in Sydney. The project is being conducted to meet the requirements for the degree of Doctor of Business Administration under the supervision of Prof. Richard Dunford of the MGSM. Prof. Dunford can be contacted on 02-9850 9984 (work). Mr Bryant's contact phone numbers are 02-9351 8778 (work) and 0416 245 379 (mobile).

If you decide to participate, you will be asked to answer a survey and meet with Mr Bryant for one or two sessions. All meetings will be conducted at times that suit you and preferably at your own offices. At or prior to, the first interview, you will be asked to answer a survey questionnaire on your decision making style and processes. The survey should take no more than 20 minutes to complete and can be answered either online or using a paper version. If you choose the online version of the survey, a link will be sent to you via personal email and will employ a secure site only accessible to the researcher using a unique userid and password

The first interview session will involve a series of questions on the same topic. If you answer the survey questionnaire plus the interview questions at the same session, this meeting could last up to 2 hours. However you may elect to fill in the survey questionnaire at a time of your own choosing, thus limiting the time required for the first interview session to 1.5 hours on average.

You may also be asked to participate in a second follow-up interview conducted a month or more after the first meeting. The second interview session will seek to explore the same issues in greater depth. The second session will also last approximately 1.5 hours.

If you agree, each interview will be tape recorded in order to improve data collection and accuracy. Mr Bryant will also request permission to read relevant documentary records such as business plans and minutes of meetings.

Your participation in this project will be completely voluntary. Mr Bryant has committed to only work with companies that support the voluntary nature of the project and allow him to negotiate separately and confidentially with potential participants. Therefore Mr Bryant shall keep your decision whether to participate or not strictly confidential and not divulge it to any other party including members of your own organisation. The only exception is that

Mr Bryant is obliged to identify participants to the employees of Macquarie University who have formal responsibility to review and supervise his research.

Any information or personal details gathered in the course of the thesis will also be kept strictly confidential. No individual will be identified in any publication of the results. Mr Bryant will retain control over the data including the audiotapes and store them under lock and key in a secure location for a period of at least five years. The data will not be shared with any party except Mr Bryant's study supervisor, Prof. Dunford. However Mr Bryant may contract a professional service provider to transcribe some of the audiotapes, but that will only be under terms that guarantee equivalent levels of confidentiality and only after gaining your prior approval.

At the conclusion of the thesis, Mr Bryant will offer you at no cost a copy of his research findings in the form of his doctoral study. He will also offer to discuss the research findings with you, however all personal and company identities will remain hidden and strictly confidential in both the written results and any discussion of those results.

If you decide to participate, you are free to withdraw from further participation in the research at any time without having to give a reason and without consequence.

I, \_\_\_\_\_, have read (or, where appropriate, have had read to me) and understand the information above and any questions I have asked have been answered to my satisfaction. I agree to participate in this research, knowing that I can withdraw from further participation in the research at any time without consequence. I have been given a copy of this form to keep.

Participant's Name: \_\_\_\_\_  
(block letters)

Participant's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Investigator's Name: \_\_\_\_\_  
(block letters)

Investigator's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

The ethical aspects of this thesis have been approved by the Macquarie University Ethics Review Committee (Human Research). If you have any complaints or reservations about any ethical aspect of your participation in this research, you may contact the Ethics Review Committee through its Secretary (telephone 9850 7854; email [kdesilva@vc.mq.edu.au](mailto:kdesilva@vc.mq.edu.au)). Any complaint you make will be treated in confidence and investigated and you will be informed of the outcome.

(INVESTIGATOR'S [OR PARTICIPANT'S] COPY)

## APPENDIX B: SEMI-STRUCTURED INTERVIEW GUIDE

### **1. Decision Making Under Time & Information Pressure**

- **Introductory statement:** Sometimes important decisions must be made quickly under time pressure and with limited information. For example, there is an unexpected opportunity to forge an exclusive alliance with a major distributor, but decisions must be made quickly before a major competitor finds out about it.
- **Initial question:** What is your own approach to decision making when decisions have to be made quickly with limited information?

### **2. Decision Making under Uncertainty and Risk**

- **Introductory statement:** Sometimes the outcomes of a decision are very uncertain and risky. For example, even though technical may results prove the functional advantages of an innovative new product, it may be very difficult to predict how many customers will want to buy it and how much they are prepared to pay.
- **Initial question:** What is your own approach to decision making when the outcome is very uncertain and risky?

### **3. Decision Making under High Emotion**

- **Introductory statement:** Sometimes feelings run high and decisions must be made in an emotionally charged situation. For example, some people become very passionate and excited when they are faced with decisions about a new opportunity. While in other circumstances, they might feel very angry and aggressive when making decisions in response to competitive threats.
- **Initial question:** What is your own approach to decision making when you feel strongly about the issues?



#### **4. Switching Decision Making Style**

- **Introductory statement:** Some decisions may require careful systematic analysis, while others may call for an intuitive approach. For example, designing a new product may require careful analysis before decisions are made. On the other hand, cutting a deal in the middle of negotiations may call for a more intuitive response or you may simply rely on previous experience.
- **Initial question:** In your own decision making, when do you rely on your intuitions or previous experience and when do you perform systematic analysis before making decisions?

#### **5. Opportunity Identification**

- **Introductory Statement:** New opportunities can emerge in many ways, sometimes after careful market analysis, while at other times they are a total surprise.
- **Initial Question:** In your decision making, how do you typically decide which opportunities you will try to exploit?

#### **6. Adaptive Regulatory Focus**

- **Introductory statement:** Some decision making tasks relate to pursuing future gains, for example, decisions about preparing to launch into a new market. However other decisions are about avoiding future losses, for example, deciding what level of product liability insurance is required.
- **Initial question:** In your own decision making, how do you approach pursuing future gains, versus avoiding future losses?

**7. Self-confidence in Decision making**

- **Initial question:** Across the range of responsibilities you have – financial, strategic, HR, marketing, etc. – how confident are you in making decisions in those areas?

**8. Importance of Decision Making**

- **Initial question:** How important is decision making as part of your role in the company, relative to other aspects of the role such as leadership?

**9. Entrepreneurial Motivations**

- **Initial question:** Why did you choose to become an entrepreneur?

**10. Self-understanding of Decision Making**

- **Initial question:** Overall, what do you think are your main strengths and weaknesses as a decision maker?

**11. Open question**

- **Initial question:** Is there anything you would like to say about this topic or any other thoughts that come to mind?

### APPENDIX C: REGULATORY FOCUS QUESTIONNAIRE

Items 1, 3, 7, 9, 10 and 11 are used to derive measures for promotion pride. Items 2, 4, 5, 6 and 8 are used to derive measures for prevention pride.

1. Compared to most people, are you typically unable to get what you want out of life? [Factor Loading = -0.65]

1	2	3	4	5
never or seldom		sometimes		very often

2. Growing up, would you ever “cross the line” by doing things that your parents would not tolerate? [Factor Loading = -0.8]

1	2	3	4	5
never or seldom		sometimes		very often

3. How often have you accomplished things that got you “psyched” to work even harder? [Factor Loading = 0.37]

1	2	3	4	5
never or seldom		a few times		very often

4. Did you ever get on your parents’ nerves often when you were growing up? [Factor Loading = -0.65]

1	2	3	4	5
Never or seldom		Sometimes		very often

5. How often did you obey the rules and regulations that were established by your parents? [Factor Loading = 0.56]

1	2	3	4	5
never or seldom		sometimes		very often

6. Growing up, did you ever act in ways that your parents thought were objectionable? [Factor Loading = -0.84]

1	2	3	4	5
never or seldom		sometimes		very often

7. Do you often do well at different things you try? [Factor Loading = 0.54]

1	2	3	4	5
never or seldom		sometimes		very often

8. Not being careful enough has gotten me into trouble at times. [Factor Loading = -0.55]

1	2	3	4	5
never or seldom		sometimes		very often

9. When it comes to achieving things that are important to me, I find that I don't perform as well as I ideally would like to do. [Factor Loading = -0.51]

1	2	3	4	5
never true		sometimes true		very often true

10. I feel like I have made progress toward being successful in my life. [Factor Loading = 0.81]

1	2	3	4	5
certainly false				certainly true

11. I have found very few hobbies or activities in my life that capture my interest or motivate me to put effort into them. [Factor Loading = -0.53]

1	2	3	4	5
certainly false				certainly true

## APPENDIX D: ENTREPRENEURIAL SELF-EFFICACY SCALE

Please rate the following items in relation to yourself in performing these tasks related to owning your own business.

Choose (1) if completely unsure

Choose (2) if unsure

Choose (3) if somewhat unsure

Choose (4) if neither sure nor unsure

Choose (5) if somewhat sure

Choose (6) if sure

Choose (7) if completely sure

1. Can you successfully complete the necessary marketing tasks related to owning your own business (consider selling, selecting a location, advertising, customer service)? [Factor Loading = 0.64]

1            2            3            4            5            6            7

2. Can you successfully complete the necessary accounting tasks related to owning your own business (consider obtaining financial resources, bookkeeping, monitoring accounts, budgeting)? [Factor Loading = 0.42]

1            2            3            4            5            6            7

3. Can you successfully complete the necessary personnel tasks related to owning your own business (consider employee selection, discipline, motivation, job analysis)? [Factor Loading = 0.76]

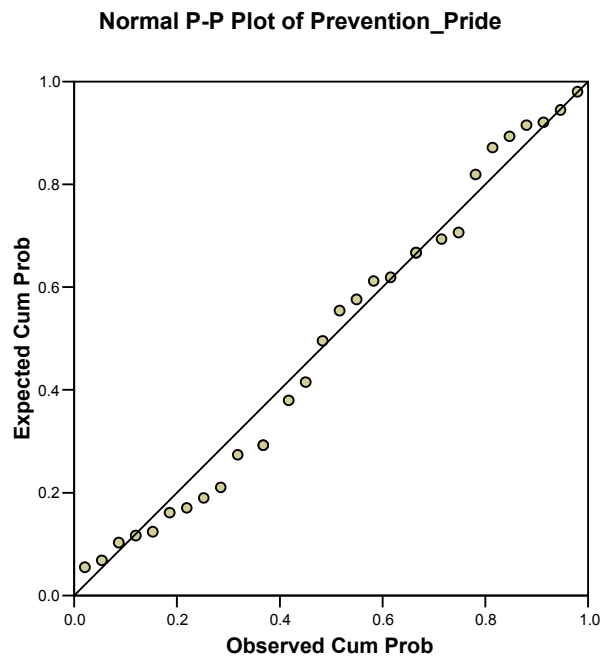
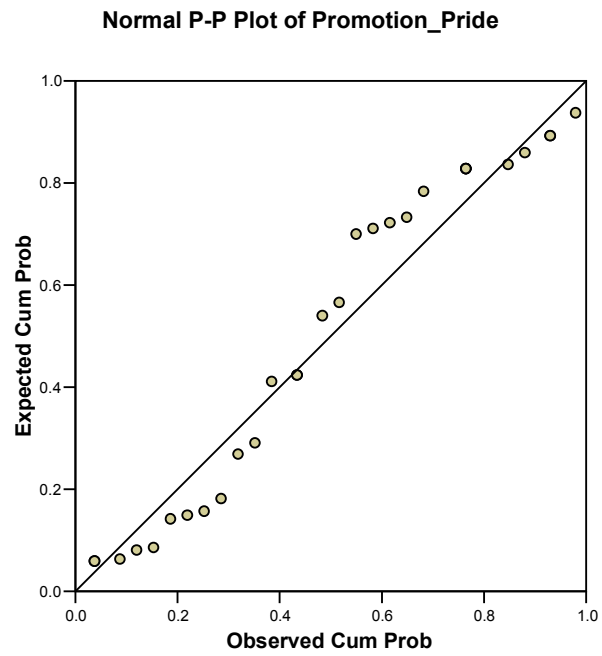
1            2            3            4            5            6            7

4. Can you successfully complete the necessary production tasks related to owning your own business (inventory, quality control, manufacturing, layout of facilities)? [Factor Loading = 0.84]

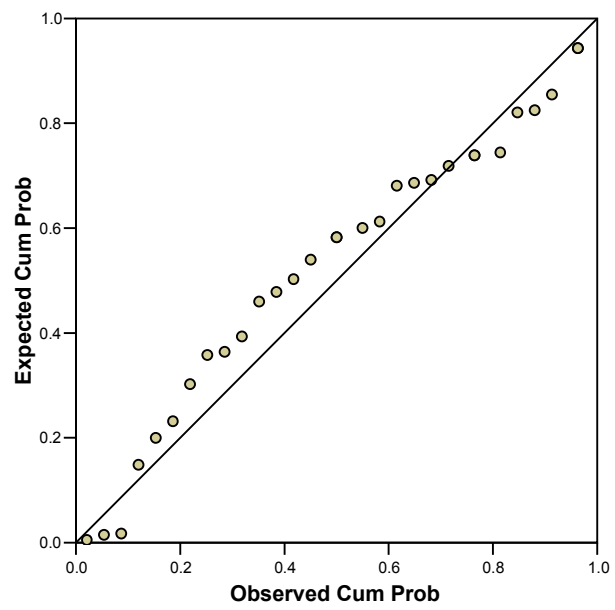
1            2            3            4            5            6            7

5. Can you successfully complete the necessary organizational tasks related to owning your own business (consider planning, coordinating projects, assessing performance of the business)? [Factor Loading = 0.81]

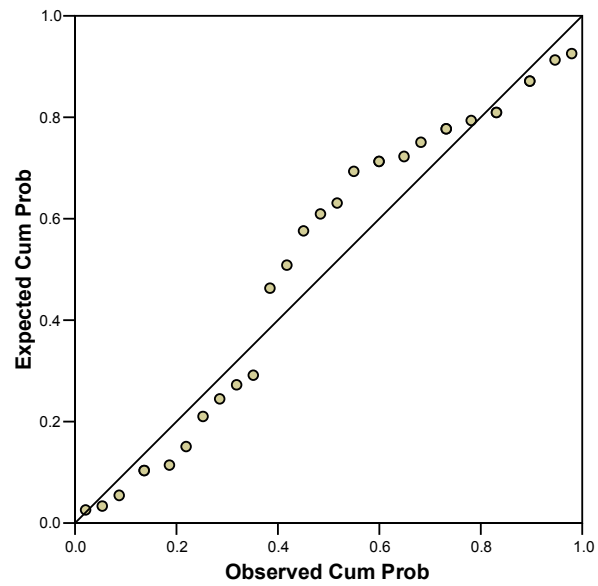
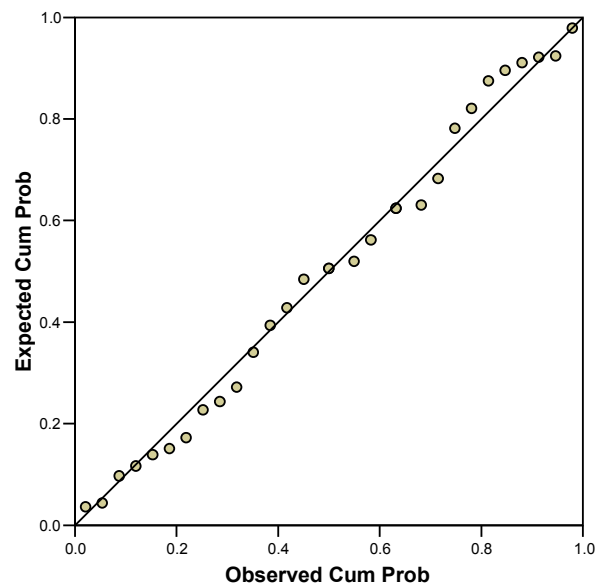
1            2            3            4            5            6            7

**APPENDIX E: NORMALCY OF ENTREPRENEUR DATA**

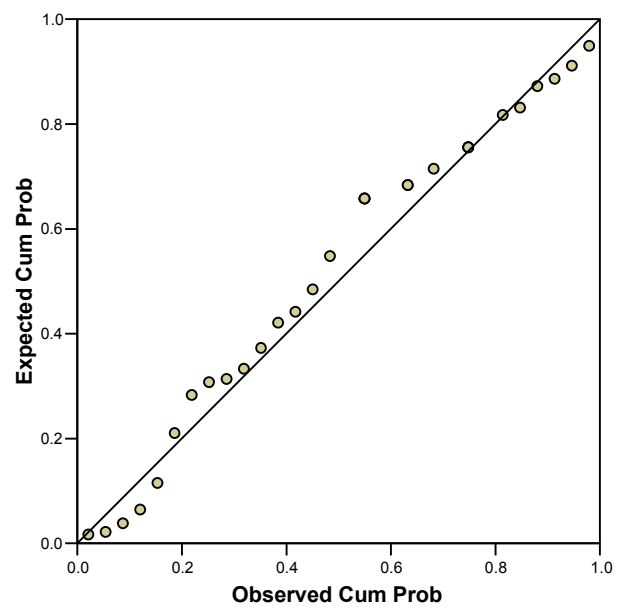
Normal P-P Plot of Entrepreneurial\_Self\_Efficacy





**APPENDIX F: NORMALCY OF MANAGER DATA****Normal P-P Plot of Promotion\_Pride****Normal P-P Plot of Prevention\_Pride**

Normal P-P Plot of Entrepreneurial\_Self\_Efficacy



## APPENDIX G: ENTREPRENEURIAL-REGULATION CASES

Entrepreneurial Regulation Group	Case ID	Promotion Pride Tertile	Entrepreneurial Self-Efficacy Tertile	Combined Scores	Gender	Age in Years	Education Level	Current Role	Length of Tenure	Industry Sector	Year of Company Founding
Weak	E29	1	1	1.16	Male	40-49	2 <sup>nd</sup> degree	CEO	3	Biotech	1998
Weak	E25	1	1	1.16	Female	30-39	2 <sup>nd</sup> degree	Director	1	Retail	2004
Weak	E01	1	1	1.23	Male	40-49	2 <sup>nd</sup> degree	CEO	2	Biotech	2001
Weak	E06	1	1	1.40	Male	50-59	Other	MD	3	Biotech	1999
Weak	E28	1	1	1.41	Female	50-59	2 <sup>nd</sup> degree	MD	2	Biotech	2001
Weak	E20	1	1	1.45	Male	40-49	Other	MD	3	ICT	1999
Weak	E19	2	1	1.45	Male	40-49	2 <sup>nd</sup> degree	MD	3	Biotech	1999
Weak	E07	1	2	1.47	Male	40-49	2 <sup>nd</sup> degree	CEO	3	ICT	2001
Weak	E17	2	1	1.50	Male	50-59	2 <sup>nd</sup> degree	CEO	5	Biotech	1994
Weak	E04	1	2	1.51	Male	30-39	2 <sup>nd</sup> degree	Director	1	ICT	2003
Moderate	E21	1	2	1.53	Male	40-49	1 <sup>st</sup> degree	CEO	3	ICT	2001
Moderate	E05	1	2	1.56	Female	40-49	1 <sup>st</sup> degree	CEO	4	Services	1996
Moderate	E09	3	1	1.61	Male	40-49	2 <sup>nd</sup> degree	Chairman	3	Biotech	2001
Moderate	E02	2	2	1.62	Male	30-39	Other	CFO	2	Biotech	2002
Moderate	E15	2	3	1.64	Male	30-39	2 <sup>nd</sup> degree	CEO	3	Biotech	1999
Moderate	E10	2	2	1.67	Male	50-59	2 <sup>nd</sup> degree	MD	3	ICT	2000
Moderate	E22	2	3	1.70	Male	50-59	1 <sup>st</sup> degree	Chairman	4	ICT	1996
Moderate	E23	3	1	1.71	Male	50-59	2 <sup>nd</sup> degree	CEO	4	Biotech	1999
Moderate	E12	2	2	1.72	Male	50-59	Other	CEO	5	ICT	1988
Moderate	E08	3	2	1.76	Male	30-39	2 <sup>nd</sup> degree	CEO	2	ICT	2002
Strong	E13	3	2	1.76	Female	30-39	2 <sup>nd</sup> degree	Director	1	Retail	2004
Strong	E14	2	3	1.77	Female	50-59	2 <sup>nd</sup> degree	Director	4	Services	2002
Strong	E16	3	2	1.79	Male	60+	2 <sup>nd</sup> degree	MD	5	ICT	1983
Strong	E03	2	3	1.80	Male	30-39	1 <sup>st</sup> degree	MD	3	ICT	1998
Strong	E24	3	3	1.81	Male	40-49	1 <sup>st</sup> degree	CEO	1	ICT	2001
Strong	E30	3	3	1.82	Male	40-49	1 <sup>st</sup> degree	CEO	3	ICT	2000
Strong	E18	3	3	1.83	Female	40-49	2 <sup>nd</sup> degree	CEO	3	Biotech	2000
Strong	E11	3	3	1.87	Male	20-29	1 <sup>st</sup> degree	CEO	4	ICT	1997
Strong	E27	2	3	1.89	Female	30-39	1 <sup>st</sup> degree	MD	1	Retail	2004
Strong	E26	3	3	1.93	Male	40-49	Certificate	CEO	3	ICT	1991

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