

**HISTORICAL CONTEXT, PRESENT TRENDS AND FUTURE DIRECTIONS IN
ENTREPRENEURIAL COGNITION RESEARCH**

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ABSTRACT

In this introduction to the *Handbook of Entrepreneurial Cognition*, we briefly review recent developments in social cognition and entrepreneurial cognition and the context in which these developments have arisen. Firstly, we present a high-level historical review of research done in social cognition more generally. Secondly, we review the roots of entrepreneurial cognition and the current state of the field. Lastly, we provide an overview of the chapters in the Handbook.¹

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INTRODUCTION

Entrepreneurial cognition has emerged as an important perspective in entrepreneurship (cf. Ireland & Webb, 2007; Mitchell et al., 2002; 2004; 2007) and has been defined as, “*the knowledge structures that people use to make assessments, judgments or decisions involving opportunity evaluation and venture creation and growth* (Mitchell et al., 2002: 97).” As research in the area of entrepreneurial cognition has developed, a central research question has emerged: “how do entrepreneurs think” (Mitchell et al., 2007: 3). While the earlier approaches to entrepreneurial cognition were focused on the psychological processes that underlie behavior (Shaver & Scott, 1991), the area has broadened to focus on heuristic-based logic (e.g., Simon, Houghton, & Aquino, 2000), perceptual processes (e.g., Gaglio & Katz, 2001), expertise (e.g., Mitchell, Smith, Seawright, & Morse, 2000), and effectuation (e.g., Sarasvathy, 2001), among others. As Grégoire, Corbett & McMullen (2011) highlighted, however, despite the advances made, opportunities remain for developing the area.

In the spirit of their call for further research, a complementary perspective in entrepreneurial cognition is emerging that is based in the idea of socially situated cognition (Smith & Semin, 2004). At the center of the socially situated cognition approach is the idea that cognition is not static, but situated within specific individuals and environments, and the idea that cognition has functional purposes. In the next section, we provide a high-level historical review of research done in social cognition more generally. Our reason for doing so is to assist us in setting a foundation that highlights how recent developments in cognition can advance research done in entrepreneurial cognition and to illustrate the context in which these recent developments arose. We then provide a brief précis of entrepreneurial cognition specifically. Finally, we provide an overview of the chapters in the Handbook, especially as they relate to social cognition research generally and entrepreneurial cognition research specifically.

HISTORICAL CONTEXT

This historical sketch will trace the social cognitive approach in conjunction with the study of mental processes in psychology. This sketch is admittedly a selective one, and is not meant to present the full spectrum of intellectual thought and research for each time period covered (see Costall, 2006). The purpose of this sketch is to simply place the current review into its historical context.

The Early Years of Mental Process Research

Over 300 years ago, Leibniz concluded in his *New Essays on Human Understanding* that human choice followed by motivated movement toward that choice was largely the result of, “an infinity of perceptions, unaccompanied by awareness or reflection” (1704/1981, p. 53). The idea that mental processes exist and possibly influence human behavior was not new even in Leibniz’s day (see Whyte, 1960); but Leibniz did seem to be one of the first to suggest that mental processes preconsciously influence the choices and behaviors we pursue in response to stimuli from the environment (Merikle & Reingold, 1992).

Moving forward 100 years, demonstrations of hypnosis and the advent of evolutionary theory provided additional evidence of mental processes influencing human thought and behavior (Bargh & Morsella, 2008). Toward the end of the 1800s, one of the first reported experimental demonstrations of nonconscious mental processes influencing choices (and the first American psychological experiment, see Kihlstrom, Barnhardt, & Tataryn, 1992) was provided by Pierce and Jastrow (1884). Pierce and Jastrow found that when forced to choose which of two very similar pressures was heavier, complete guesses were correct more often than chance would allow. A few years later Sidis (1898) reported similar findings using visual stimuli (which were replicated by many others, see Adams, 1957). Helmholtz's (1867/1968) perceptual theory also supported these findings.

However, even in these early years, the idea of unseen mental processes influencing human choice did not go unchallenged, as evidenced by James' (1890/1950) discussion of mental structures in chapter VI of Volume I of his book *Principles of Psychology*. Nevertheless, even James supported the view that one's selective interests or habits can shape one's perception of the environment, which in turn can automatically influence behavior (Gollwitzer & Moskowitz, 1996). In fact, a separate line of research began investigating the formation of mental processes as the result of skill development and habit (see Bryan & Harter, 1899; Solomons & Stein, 1896). Jastrow (1906), for example, proposed that developing skills and habits could lead to the process of thinking withdrawing from conscious awareness.

Around the same time that Sidis and others were conducting their experiments, Breuer and Freud (1893-1895/1955) published their book, *Studies in Hysteria*. Freud is often credited as the founder of nonconscious mental process research, but as the history reveals, ideas about such processes considerably predate Freud. In fact, Freud repeatedly struggled with the problem of explaining mental processes (see Masling, 1992), but as time passed he came to distinguish between primary process thinking (unconscious) and secondary process thinking (preconscious and conscious). Primary processes were thought to be irrational and motivated by pleasure, while secondary processes attempted to achieve rationality and to operate according to reality (Overskeid, 2007). Therefore, Freud's contribution came not in his delineation of mental processes, but in his view that perception can be constructed both by emotional (primary process) and intellectual (secondary process) considerations (Erdelyi, 1992).

In sum, early work in examining mental processes including such diverse areas as hypnosis, evolutionary theory, perceptual theory, skills and habits, and unconscious thinking, collectively came to the conclusion that mental processes influence human choice and behavior in conjunction with influences from the environment. Particularly influential in the early years was Freud's view of mental processes; nevertheless, given the difficulty in applying Freud's conceptions to everyday mental functioning, a short time later, ideas and research in line with Sidis (1898) and Helmholtz's (1867/1968) work began as reviewed next.

Constructivism to Behaviorism

Consistent with Sidis and Helmholtz, researchers began to view mental processes according to a constructivist perspective. Constructivist views were defined by the assumption that human thinking itself provides meaning to reality. Promoting this line of thought were the Gestalt psychologists, Bartlett, Mead and others. Although the Gestalt approach did not specifically refer to mental processes when explaining perception, the processes by which perceivers were thought to organize the environment were asserted to be automatic and

nonconscious (Wittenbrink, 2007). In fact, an early empirical study by Zeigarnik (1927), demonstrated how personal motivations could influence mental activity nonconsciously by influencing what participants can remember. Bartlett (1932), although usually associated with his work on memory, provided research evidence showing that personal motivations and dispositions determined the content of perception (see Erdelyi, 1992). Mead's (1934/1967) social behaviorism attempted to apply empirical methods to the understanding of the constructive nature of social perception (see Bless & Forgas, 2000). Other early social psychological theorists like Lewin, Sherif, Heider, and later Festinger all proposed that perceptions of self and others are actively constructed (usually outside of conscious awareness) based on personal motivations (Moskowitz, Skurnik, & Galinsky, 1999).

While these important developments were taking place in what would become known as social psychology, behaviorism was increasingly becoming the mainstream approach in psychology (beginning to take root with Watson, 1913). Skinner's (1938) behaviorism, although rejecting of a constructivist view of perception, did distinguish between rule-governed (conscious) and contingency-shaped (nonconscious) influences on behavior. According to the behaviorist view, people are nonconsciously influenced by their environment without the ability to regulate how they are influenced (Overskeid, 2007). Any mediating internal variables (e.g., interpretations, construal, and motivations) between a stimulus and response had no explanatory standing (Bargh & Ferguson, 2000).

In sum, moving forward from Freud's conception of mental processes, researchers focused more on everyday types of mental functioning such as perception, organization, memory, and motivation. Nevertheless, the establishment of behaviorism, which completely rejected references to most mental functions, overshadowed this constructivist view on mental processes. Despite the firm establishment of behaviorism, psychologists were increasingly becoming unsatisfied with the behaviorist explanation of complex human behavior such as speech production (Chomsky, 1959; Hebb, 1949; Lashley, 1951). The problem that the behaviorists constantly faced was that the needed intra-individual psychological mechanisms could not be used as explanatory mediators between the environment and behavior (see Bargh & Ferguson, 2000). The lack of utility in the behaviorist theory for explaining higher order human thinking and behavior contributed, in part, to the "New Look" in perception movement of the late 1940s and early 1950s that will be reviewed next (Kihlstrom et al., 1992).

A "New Look" into Mental Process Research

Starting around the late 1940s, a series of new research findings suggested that even basic human sensory detection and perceptual identification processes could be influenced by higher-order mental processes (e.g., attention, expectation, emotion, motivation; Bruner, 1957). For example, McGinnies (1949) measured participants' galvanic skin responses and found elevated levels (compared to control participants) when being exposed to unidentified taboo words. These series of research findings became known as the "New Look" on perception, since they were in direct contrast to popular behavioral theories of the time.

The "New Look" was in many ways a 'New Look Back' to the non-behaviorist research and theorizing about the active construction processes humans engage in when viewing their world (e.g., Bartlett, 1932). Proponents of the New Look argued that, the reason we actively construct our world is because it allows us to first, reduce an extremely complex environment in a way that is not perceived as being taxing, and second, provide meaning and predictability

based on the categorization processes (temporary or chronic, see Kelly, 1955) that are produced (Bruner, 1957). Thus, our mental system is powered by the adaptive need to gain perceived “control over a dynamic social world” (Gollwitzer & Moskowitz, 1996, p. 377). Importantly, our subjective view of the world appears to exist without mediation by the needs, motivations, desires etc. that actually produced that view (Bless & Forgas, 2000; Moskowitz et al., 1999).

The New Look perspective was met with both conceptual and methodological criticisms (see Kihlstrom et al., 1992). However, as will be discussed further, the general constructivist tenets of mental functioning and the importance of expectations and context on perception have withstood such criticisms (Balctis & Dunning, 2006). The idea of nonconscious motivation has been less well received (Greenwald, 1992). In fact, the assertion that motivational states can nonconsciously influence perception (based on the research evidence provided by the New Look researchers) was a particularly contentious topic (e.g., Adams, 1957; Eriksen, 1958; Goldiamond, 1958; Ruiz & Krauss, 1968; Zajonc, 1962; for a review see Dixon, 1981). In retrospect many of the strong criticisms against nonconscious motivation seem to have been driven by a general discomfort with the idea that human behavior and functioning could be directed by nonconscious motivation and thus consistent with general Freudian conceptions (Bruner, 1992; Dijksterhuis, Aarts, & Smith, 2005; Dixon, 1981).

In sum, based in part on the lack of utility in the behaviorist theory for explaining higher order human thinking and behavior, researchers began to examine the previously forbidden mediators between the environment and behavior. Examination of mediators led to the “New Look” perspective on perception, which found that such things as attention, expectations, and motivations mediate the influence of the environment on human behavior. Nevertheless, based on contested conceptual and methodological issues, researchers began to move beyond New Look research in search for more structured conceptions of mental processing, which in conjunction with the computer revolution, led to what we now call cognition.

Cognition as the Mental Process

By 1956 (the year generally accepted as the beginning of the cognitive revolution), research in psychology was increasingly focused on the previously “off-limits” mediators between stimulus and response. The information processing approach, which became mainstream by the early 1970s, was the dominant approach adopted in the study of these stimulus-response mediators (Bruner, 1992). The tenets of the New Look perspective concerning the adaptive functioning of selective attention thrived under this information processing conception of human thinking (see Kahneman & Treisman, 1984). This conception allowed cognitive researchers to attempt to experimentally determine the extent of human preconscious analysis (Bargh, 1992). The cognitive information processing approach also allowed for experimental demonstrations of early conceptions of skill development and habit (Wegner & Bargh, 1998).

Generally considered to be the manifesto of the cognitive revolution, Neisser (1967) claimed that in order to explain higher order thinking processes in humans, a person’s goals and motivations that are directed toward the current environment must be taken into account. Nevertheless, explanations that focused on motivational and/or personality influences were rare, as they were being replaced with information processing terminology. Therefore, the general constructivist approach survived, albeit in cognitive process form. This new approach was important because it gave researchers a conceptual background free of concepts that had

complicated research like the New Look perspective. In particular, different forms of nonconscious and conscious mental processes were delineated and investigated in ways never conceived of previously (e.g., Logan & Cowan, 1984; Regan, 1981). Priming manipulations (subliminal and supraliminal) became a prominent way to tap into these human mental systems (for other ways see e.g., Debnar & Jacoby, 1994). For example, Marcel (1983) found that subliminal primes associated with target words facilitated lexical responses to targets.

Compared to the New Look movement, mental processes were viewed in a more straightforward and simplistic way (see Bargh & Morsella, 2008; Dijksterhuis et al., 2005). Individuals were thought to nonconsciously construct their world, not according to motivational considerations, but simply based on routine processing of information (see Bargh, 2004; Pyszczynski, Greenberg, & Koole, 2004). In many ways, however, cognitive theorists borrowed ideas from a behaviorist backdrop leading to the above view. One of the main difficulties then came in distinguishing mental processes from application of those processes (e.g., Monteith, Sherman, & Devine, 1998). Underlying this problem was a conceptual disconnection between thoughts and actions based on the way mind and behavior were understood by cognitive researchers at the time (Costall, 2006).

In sum, continuing with the focus on the mediators between the environment and human behavior used in the New Look movement, researchers refined conceptions of perception, motivation, and individual differences into an information processing approach. Such approach allowed researchers to apply computer terminology to the process of human cognition and to more clearly catalog the routine processing of information by humans. Although such an approach provided clear theoretical boundaries to understanding cognition, the application of those cognitive processes into the world was missing. Work by social psychologist helped to remedy this problem with a focus on interpersonal aspects of cognition as reviewed next.

Social Cognition as the Mental Process

Starting in the early to mid 1970s, social psychologists began to incorporate cognitive methodology and thinking into the study of how individuals construe their social world. Much of this research concluded that the mental workings of the brain are distinct from the subjective experiences of those workings (Nosek, 2007). For example, Bargh and Pietromonaco (1982) showed that subliminally activated trait concepts (e.g., hostility) influenced the impression participants made of a person without the participants being aware of the influence of the prime on their impressions (see also Devine, 1989). The nonconscious activation of social knowledge according to principles of accessibility, applicability, and salience were all deemed important (Higgins, 1996). The interaction between perceiver's mental representations and the environment were thought to determine perception (Bargh, Lombardi, & Higgins, 1988). Social-cognitive research also suggested that individuals nonconsciously evaluate all that crosses their paths (Ferguson, 2007). Social environmental cues were thought to directly guide behavior, with mediation by internal representations being the exception rather than the rule (Dijksterhuis, & Bargh, 2001). This early social-cognitive research generally held to the cognitive view of noncomplex mental processes influencing people's construal of their world in a nonmotivational way (Bargh, 2008b). But unlike the cognitive view, there was a focus on the internal interpretation of a situation similar to the New Look perspective (Bargh & Ferguson, 2000). Nevertheless, a major problem that social-cognitive research began to experience was that nonconscious aspects of mental thought were not always simplistic, and motivational considerations (e.g., goals, needs, wants) seemed to be much more important in determining a

person's social perception than current theorizing allowed (e.g., Thompson, Roman, Moskowitz, Chaiken, & Bargh, 1994). And so, starting in the early 1990's motivational considerations came into the mainstream of research.

Transitioning from cognitive to motivational considerations still allowed cognitive models such as the parallel-distribution processing model to be predictive, given that many representations (e.g., context, goals, motives) contribute to one psychological state (see Ferguson & Bargh, 2003). But beyond cognitive models, motivation was thought to be more central, determining the kind of processing that occurred. For example, motivation in the form of goals was thought to specify action, persistence, and commitment to one's construal of the world (Gollwitzer & Moskowitz, 1996; Kruglanski et al., 2002). As a result, people were predicted to process identical information differently depending on their currently relevant motivations (Bargh, 2008a; e.g., Tetlock, 2002).

Bargh (1990) posited that goal directed thoughts and behaviors themselves could be activated and strategically pursued outside of conscious awareness. Many factors may influence whether a nonconscious goal is pursued. As examples, nonconscious attitudes toward a goal (Ferguson, 2007), previous associations with controlling feedback (e.g., Ratelle, Baldwin, & Vallerand, 2005), subtle priming of goals (e.g., Rasinski, Visser, Zagatsky, & Rickett, 2005), goals of the perceiver (e.g., Jonas & Sassenberg, 2006), and exposure to objects associated with certain goals (e.g., Kay, Wheeler, Bargh, & Ross, 2004) can influence whether individuals pursue nonconscious goals. In fact, subliminal persuasion techniques, adapted from the cognitive and social cognitive literatures, have been found to depend on personal motivational factors. Use of subliminal priming with respect to the brand name of a drink, for example, influences participants' choice and intention to drink that brand *only* if participants were already thirsty (Karremans, Stroebe, & Claus, 2006; see also Strahan, Spencer, & Zanna, 2002).

In sum, by social psychologists incorporating cognitive methodology and theory into the study of how individuals construe their social world, the application of cognitive processing theory into the world was better delineated. With a focus on the social cognitive processing of information, came a realization of the central role motivation played in determining the kind of cognitive processing that occurred. Such a focus on motivation brought research in the area of mental processing full circle (reviewed next).

Return to the “New Look” on Mental Processes

Recent motivational research has supported many of the earlier constructivist views reviewed above (e.g., Bartlett, 1932; Bruner, 1957; Helmholtz, 1867/1968; Mead, 1934/1967; Sidis, 1898). Even the more controversial aspects of the New Look perspective are now finding research support, such that motivations, goals, and needs are thought to preconsciously influence perception, thoughts, and behaviors. For instance, in research that measures visual gaze, participants have been shown to selectively avoid goal-irrelevant stimuli and tune to goal-relevant stimuli outside of awareness (e.g., Chiao, Heck, Nakayama, & Ambady, 2006; Isaacowitz, 2006; Koivisto & Revonsuo, 2007). Individual desires and preferences have also been found to nonconsciously influence interpretation of visual information toward the desired preference (Balci et al., 2006). Such findings make sense when considering the numerous and complex stimuli that are present in any one situation at the same time (Gollwitzer & Moskowitz, 1996). Perception and the activation of mental representations must directly interact with individual representations (e.g., current goals and motives) and contextual cues

from the environment (Anderson, Moskowitz, Blair, & Nosek, 2007; Kunda & Spencer, 2003). In other words, what someone wants (even when not conscious) influences what is mentally accessible, which in turn can lead to perceptions of any relevant and ambiguous stimuli to shift based on that accessible knowledge (Fishbach & Ferguson, 2007).

Even in the case of more chronic tendencies like habits, behaviors become linked to the person's desired self-regulatory outcomes (e.g., Neal, Wood, & Quinn, 2006). Of importance, these chronic motives may make it less likely that a person will respond to the various influences that come from the environment, allowing for more adaptive and appropriate responses from the person without the need for conscious involvement (Bargh, 2006). In sum, as advances have been made in social cognitive research, motivations, goals, and needs have been shown to preconsciously influence perception, thoughts, and behaviors, consistent with a long history of constructivist views of mental functioning, setting the stage for a more integrated approach to understanding human cognition; namely the socially situated cognition approach.

The Socially Situated Cognition Approach

As we have described previously, in this Handbook we adopt the lens of socially situated cognition as a generally applicable approach to the examination of the many facets of entrepreneurial cognition research. We have done so, based in part on our historical sketch presented previously; specifically, that such an approach brings together the evolution of the study of mental processes into a more integrated whole. Four broad themes constitute a socially situated approach to entrepreneurial cognition (Mitchell et al., 2011: 774-775; Smith & Semin, 2004):

- (1) Entrepreneurial cognition is *action-oriented* (i.e., captures the positive or negative evaluations of, or motivations toward an object or concept);
- (2) Entrepreneurial cognition is *embodied* (i.e., captures the interrelationship between the physical brain and body to capture how the body shapes the mind)
- (3) Entrepreneurial cognition is *situated* (i.e., captures the communicative context, relational context, and group context in which cognition and action occur), and
- (4) Entrepreneurial cognition is *distributed* (i.e., captures the variety that occurs in the distribution of cognition across social agents and the environment)

The socially situated cognition approach (Smith & Semin, 2007; 2004) thus represents an attempt to integrate current insights from social psychology and cognition research, such as those findings reviewed above. In other words, the socially situated cognition approach argues that cognition regularly occurs in a social environment and is: action oriented, situated, embodied, and distributed (for a recent review see Semin & Smith, 2013). According to this view, if cognition is for action and in our body, then motivation and emotion regulate cognition. Similarly, if cognition is context-specific, then moment-to-moment interactions with the social environment profoundly impact cognition. And if cognition is distributed, then social objects enable and support cognition. Social objects therefore not only constitute the content of thought, but also shape the process underlying thoughts and behavior. Such a statement not only provides an accurate representation of the current state of the field of social cognition but also, as we now describe, is consistent with current trends and directions in entrepreneurial cognition research.

ENTREPRENEURIAL COGNITION

Despite the newness of the area, entrepreneurial cognition research has progressed in unique ways compared to the broader social cognition domain reviewed above. We begin by briefly examining the roots of this area of study and end with a brief review of the current state of the field. Accordingly, in Table I.1 we provide a summary of early work done in entrepreneurial cognition up to 1990, and in Table I.2 we provide a summary of work done in the field from the 1990s to the present. In doing so, we seek to provide a brief précis of the entrepreneurial cognition research, while linking it to work done in social psychology more broadly. We do so as a way to link the historical discussion of social cognition research generally and entrepreneurial cognition research specifically to the chapters in this Handbook.

{Insert Table I.1 }

Roots of Entrepreneurial Cognition Research

Similar to social cognition research more generally, entrepreneurial cognition research can be traced back to early economists. In particular, Cantillon (1755/1931) suggested that entrepreneurial-like individuals exercise judgment under uncertainty. Likewise, Baudeau (1767/1910) suggested that such exercise of judgment demands specialized knowledge. In his *Treatise on Political Economy* (1810), Jean-Baptiste Say refers to entrepreneurs as individuals who think and act (through experimentation) such that profit may result. We find these links between what exists in entrepreneurs' minds and their resulting action (i.e., exercising judgments in the face of uncertainty through the translation of knowledge into action and experimentation) to be prescient. The idea that entrepreneurs exist and act in uncertain environments captures both the *situated* and *action-oriented* nature of socially situated entrepreneurial cognition (Mitchell, Randolph-Seng, Mitchell, 2011). Entrepreneurship research continues to develop these notions (cf. Busenitz & Alvarez, 2001; Smith, Mitchell & Mitchell, 2009).

Moving forward, early theorists in the area continued to emphasize the importance of cognitive elements of entrepreneurship such as judgment, imagination, decision making, and alertness (Danhof; 1949, Dewing, 1920; Evans, 1957; Lamb, 1952). This early research recognized that entrepreneurship processes interact with the particular time and place in which they occur (McCuire, 1964), and that the social, political, economic, and psychological factors that influence entrepreneurial behavior need to be included (Palmer, 1971). Despite all of this, the focus continued to be on the characteristics of the entrepreneur (cf. Brockhaus & Horwitz, 1986). This focus on using personality characteristics/traits to distinguish between entrepreneurs and non-entrepreneurs overlapped with aforementioned behaviorist movement in psychology in both time and purpose. That is, like the "behaviorist" view, which asserted that individuals had no control over the influence of the environment on their behaviors, the "traits" view of entrepreneurship asserted that fairly immutable traits governed the behaviors of entrepreneurs (e.g., McClelland, 1965).

But glimmers of a cognitive view of entrepreneurship were on the horizon. Specialized knowledge, decision making, perceptions, and individual differences, for example, were shown to categorize entrepreneurial cognition-like processes (Cooper, Woo, & Dunkelberg, 1988; Corman, Perles, & Vancini, 1988; Hébert & Link, 1989; Hisrich & Jankowicz, 1990; Kirzner, 1973; Schultz, 1975; Smeltzer, Fann, & Nikotaisen, 1988; Smith, Gannon, Grimm, & Mitchell, 1988). Toward the end of this period, Bird (1988) introduced her concept of entrepreneurial intentions and the idea of entrepreneurs' cognition (Bird, 1992). Bird's application of the concept

of entrepreneurial intentions to cognition was an important theoretical advancement because to this point in time, the focus had been on behavior as being based in individual differences, rather than based in cognitive processes per se. By specifying entrepreneurial intentions as a necessary condition of entrepreneurial behavior, entrepreneurship as a unique form of information processing could be realized, which in turn set the stage for the research done in the area starting in the 1990's (see Table I.2).

{Insert Table I.2}

Current State of the Field of Entrepreneurial Cognition Research

As noted previously, the information-processing view of cognition had long been considered mainstream. With this as a foundation, Shaver and Scott (1991) called for a comprehensive psychological approach to the study of new venture creation and did so by focusing on the choice-based cognitive processes at the entrepreneur level of analysis. Consistent with Shaver and Scott's (1991) call, other researchers were also increasingly focusing on an information processing approach to understanding entrepreneurial attitudes, decision making, and thought processes (Bird, 1992; Kaish & Gilad, 1991; Robinson, Stimpson, Huefner, & Hunt, 1991). Further, the focus on an individual-level information processing approach to understanding entrepreneurial cognition was exemplified in research on entrepreneurial specific perceptions, heuristics and biases and entrepreneurial expertise. Lowell Busenitz's (1992) dissertation specifically focused on the role that cognitive biases played in the decision making of entrepreneurs as compared to managers, whereas Ron Mitchell's (1994) focused on the composition and classification of entrepreneurial expertise. In both cases, differences were found in the thinking of entrepreneurs versus non-entrepreneurs.

Likewise, other researchers at the time were looking at the role of perceptions on entrepreneurial intentions (Krueger, 1993; Krueger & Carsrud, 1993; Krueger & Dickson, 1994) and the idea that self-perceptions are important, especially in terms of a belief by entrepreneurs that they think differently than non-entrepreneurs (McGrath & MacMillan, 1992) and believe that they have high levels of competencies in venture creation (Chandler & Jansen, 1992). These concepts associated specifically with entrepreneurial intentions continued to develop (Kolvereid, 1996). Krueger and Carsrud (1993), for example, expanded intention-based approaches by arguing that intentions channel beliefs and perception into the intent to act, which was followed by subsequent empirical support for this argument (Krueger, 1993). Self-efficacy was also found to be an important component to consider in understanding entrepreneurial intentions (Boyd & Vozikis, 1994; Chen, Greene, & Crick, 1998; Gatewood, Shaver & Gartner, 1995; Krueger & Brazeal, 1994; Krueger & Dickson, 1994; Pineda, Lerner, Miller, & Phillips, 1998).

As the field began to mature, there was an increased focus on expanding upon earlier work done in entrepreneurial cognition. For instance, in the areas of expertise, Mitchell, Friga and Mitchell (2005) suggested how the development of expertise might be responsible for the development of entrepreneurial intuition (Mitchell, Friga, & Mitchell, 2005). Similarly, Mitchell, Mitchell and Mitchell provided an approach for identifying the expert script-based components of new venture formation expertise (Mitchell, Mitchell, & Mitchell, 2009). Baron and Markman (2003) likewise suggested that expertise also applied to the area of social skills in their findings that financial success is contingent on an entrepreneur's social competence (Markman & Baron, 2003). Baron and Ensley (2006) further contributed to research on entrepreneurial expertise in highlighting that expert entrepreneurs differed from novice entrepreneurs in how they identified

patterns among seemingly unrelated events (Baron & Ensley, 2006). And importantly, based on the work of Sarasvathy (2001) that developed the idea of effectuation in entrepreneurship, extensive research has demonstrated how expert entrepreneurs are more likely to use effectual logic than novice entrepreneurs (Dew, Read, Sarasvathy, & Wiltbank, 2009; Read, Dew, Sarasvathy, Song, & Wiltbank, 2009; Read, Song, & Smit, 2009). Given the development of research on entrepreneurial expertise, an ancillary question has also emerged regarding how entrepreneurial expertise can be developed. For example, Corbett (2005, 2007) proposed a conceptual model of entrepreneurial learning and Mitchell (2005) suggested that there is a common process known for creating entrepreneurial expertise.

Likewise, in the area of cognitive biases and perceptions (Baron, 1998; Busenitz, 1992; Busenitz, 1996; Busenitz, 1999; Busenitz & Barney, 1997; Jenkins & Johnson, 1997; Katz, 1992; Manimala, 1992; McCarthy, Palich & Bagby, 1995; McGrath, 1999; Schooman & Cooper, 1993), researchers found that individuals decide to start ventures, in part, due to biased processing of risk (Simon, Houghton, & Aquino, 2000) and that entrepreneurs' biases vary depending on the decision environments that arise (Simon & Houghton, 2002). Similarly, entrepreneurs are more likely to have a future-oriented perspective (Baron, 2000) and are more likely to rely on mental simulation and counterfactual thinking to guide their entrepreneurial thinking (Gaglio, 2004). Furthermore, this research found that entrepreneurs tend to display overconfidence bias due *both* to personal and environmental factors (Forbes, 2005).

The focus on broader environmental factors grew in prevalence as the area of entrepreneurial cognition developed. Although much of the entrepreneurial cognition research published in the 1990s focused on the cognition of the entrepreneur (for an exception see Busenitz & Lau, 1996), the next decade saw an expanded research focus on factors that externally influence entrepreneurial cognition (Mitchell et al., 2002). That is, research began to address the *socially situated* nature of entrepreneurial cognition. This research included investigations into the cognitive scripts that underlie venture creation across cultures (Mitchell, Smith, Morse, Seawright, Peredo, & McKenzie, 2002; Mitchell, Smith, Seawright, & Morse, 2000), and into the influence of exogenous, situational factors on entrepreneurial intentions (Krueger, 2000). Consistent with a greater focus on external factors on individual-level entrepreneurial cognition, research also began to investigate the role of entrepreneurial cognition at higher levels of analysis. For instance, work in this area investigated:

- How socially constructed resource environments influenced entrepreneurial behavior (Baker & Nelson, 2005);
- How an entrepreneurial cognitive orientation influenced strategic buyouts (Wright, Hoskisson, Busenitz, & Dial, 2000);
- What a resource based-view of entrepreneurial cognitive abilities might look like (Alvarez & Busenitz, 2001);
- How organizational heuristics can contribute to the development of firm capabilities related to opportunity (Bingham, Eisenhardt, & Furr, 2007);
- How firm-level “corporate” entrepreneurial cognition can influence new venture emergence and termination (Corbett & Hmieleski, 2007; Corbett, Neck, & DeTienne, 2007); and
- How improvisation can influence firm opportunity selection and execution (Bingham, 2009).

What we find most interesting about each of these studies is the way in which they highlight the *combined* importance of the *situated* and *distributed* aspects of entrepreneurial cognition. That is, we notice how the area of entrepreneurial cognition is becoming increasingly socially situated.

A more recent trend is in the area of embodied cognition. That is, research is just beginning to capture how the physical brain and body shapes the mind. For instance, in their work on analogical and metaphorical reasoning, Cornelissen and Clarke (2010: 547) suggest that “the inductive creation of metaphorical meaning is directed and constrained . . . [where] human motor actions involving physical movement or physically holding or manipulating an object” shape how entrepreneurs think and speak about new ventures. Likewise, work in entrepreneurship has increasingly begun to focus on the topic of entrepreneurial affect (Baron, 2008). Underlying work in this area, especially as it relates to entrepreneurial cognition is that affect influences entrepreneurial cognition and behavior, especially as a result of the situated nature of affect and cognition. Work in this area largely began with research on entrepreneurial passion, linking passion to entrepreneurial thinking and action (Cardon, Wincent, Singh, & Drnovsek, 2009; Cardon, Zietsma, Saporito, Matherne, & Davis, 2005; Shepherd & Cardon, 2009). Key to the embodiment theme of socially situated cognition is the suggestion that physical mimicry matters in the contagion of passion (Cardon, 2008). Other research has broadened the focus from passion to both positive and negative affect and their consequences on entrepreneurial action generally (Baron, 2008; Foo, Uy, & Baron, 2009). The importance of the situational context to affect and the importance of affect, as an embodied experience, to action illustrate the need to adopt a socially situated approach to entrepreneurial cognition.

In this way, similar to recent areas of research within social cognition more generally, and providing a culmination of work done in entrepreneurial cognition to date, we hope that both our discussion and Tables I.1 and I.2 illustrate the parallels between the progression in psychology research and the progression in entrepreneurship research to a more socially situated approach to cognition. Specifically, we hope to highlight the need to consider this full spectrum of cognition within the entrepreneurial context by adopting a socially situated approach (Mitchell, Randolph-Seng, & Mitchell, 2011). The socially situated cognition approach to entrepreneurial cognition reflects how, as the entrepreneurial process unfolds, “social objects not only constitute the content of thought but also shape the process underlying thought and behavior” (Mitchell et al., 2011: 774).

We see three broad approaches to applying socially situated cognition to entrepreneurship. In the first approach, entrepreneurial cognition research addresses and develops one of the specific themes from socially situated cognition (e.g., the embodiment theme) using an entrepreneurship lens. It is likely that research adopting this first approach will be either: (a) grounded in specific areas of past entrepreneurial cognition research, but will address how these research areas might be reconsidered and rethought from the perspective of a socially situated cognition, or (b) importing socially situated concepts and ideas from social and cognitive psychology which are then extended to, and blended with research in entrepreneurship. In the second approach, entrepreneurial cognition research might bridge two or more themes from socially situated cognition research (i.e., extending research in one theme to other themes). This type of research might synthesize different elements of the socially situated approach (e.g., combining embodied activity with mental states, cognitive processes with content, and individual and collective levels of analysis in entrepreneurship research). In the third approach, entrepreneurial cognition research will extend beyond the themes in the socially situated

cognition view (either in a broader or narrower context), that can begin to address antecedent, process, levels, and interdisciplinary linkage-focused perspectives (cf., Grégoire, Corbett & McMullen, 2011). Research adopting this approach will likely exist as expansive and reflective contributions on the insights and explanations provided by the socially situated approach, and reflect on its position and research agenda in relation to past research on entrepreneurial cognition and social cognition. In the following section, we seek to highlight how the chapters in this Handbook begin to accomplish these purposes

INTRODUCTION TO THE HANDBOOK OF ENTREPRENEURIAL COGNITION RESEARCH

Organization of Handbook

Participating in an academic conference – either planning, presenting, or attending the sessions – provides an apt metaphor for the organization of this Handbook. Many conferences have a theme. There is often a keynote presentation. Organizers seek to group papers by common topics or interests. The goal of conference organization is to empower the participant to craft a singular experience from within a multifaceted conceptual environment. In this respect the organization of this *Handbook of Entrepreneurial Cognition* loosely resembles that of a conference.

The theme of this Handbook has not been in doubt (Entrepreneurial Cognition Research) – although as Editors we have sought to shed light on the transition from static to dynamic cognitive research conceptualizations through some degree of emphasis on socially situated cognition. The “keynote” paper in this Handbook, prepared by Robert Baron, appears in Chapter 1. While Robert does not require the reader to assume a scope of vision for the field that is limited only to his view; he does provide readers a revealing essay on the centrality of cognition to understanding complex human behavior – and especially to understanding many of the central aspects of entrepreneurship. This “big tent” approach to envisioning our field provides an overarching umbrella under which much that appears in this Handbook can be found to benefit from its shelter.

So then, in extending the metaphor; if we were to gather papers for sessions that contribute to the theory and framing of some of the more concrete conceptualizing, we would attend to Chapters 2 – 4. The framing task is one of constant creativity, revision and update. In Chapter 2 Alan Carsrud and Malin Brännback continue their linkage-focused work (referenced therein) with a contribution that connects cognitive factors such as intentions and motivations to subsequent behaviors such as goal setting. Chapter 3 has been prepared by Barbara Bird, and in it she makes the case for: (1) the important role that entrepreneurial behavior plays as a concrete outcome: one of cognition’s “most observable concrete outcomes”; and (2) a concerted focus on entrepreneurial behavior as under-researched – in need of taxonomic and measurement contributions to “true situational theories of entrepreneur’s behavior.” And then in Chapter 4, Brandon Randolph-Seng, Wallace Williams and Mario Hayek import the *non-conscious* cognition literature from the broader social cognition domain to begin to integrate insights within the non-conscious cognition research literature with research done in entrepreneurial intentions and intuition. This process of integration permits a broader-scope palate of concepts to become available to entrepreneurial cognition researchers, introducing and situating concepts spanning both the conscious and the non-conscious; and it thereby helps to suggest – in part at least – ways

to address the relative neglect of non-conscious cognition theory within the entrepreneurial cognition research domain.

Another cluster of concepts to be found in this Handbook centers on research motivated by the continuing scholarly (and popular-press) interest in entrepreneurial affect, for example, entrepreneurial emotion and passion. This interface of feeling with thinking is important in several respects – and the contributions in Chapters 5 – 7 examine some of these. For example, in Chapter 5 Maw-Der Foo, Charles Murnieks, and Elsa Chan examine the *role* of affect – consisting of both emotions *and* moods – on entrepreneurial cognition. Dynamic views of cognition are especially concerned with the source of the dynamism; and understanding the emotional environment within which entrepreneurs face moment-by-moment ups and downs is important to theory building at the feeling/thinking interface. Now consider also the affective-cognitive connection in terms of the forces in play. Such forces are not mono-dimensional. Rather, they exist and exert influence across both time and levels of analysis. In Chapter 6 Denis Grégoire unpacks this bundle of forces, and draws scholarly attention to different classes of affective / cognitive forces in entrepreneurship depending on their enduring vs. episodic nature and their plane of influence; and then he illustrates the importance of these distinctions for studying opportunity identification. Another respect in which the interface of feeling with thinking is important concerns context. Mateja Drnovsek, Alenka Slavec, and Melissa Cardon, in Chapter 7, advance a persuasive argument for a concept (new-to-entrepreneurial cognition research) of “situated emotions.” In this chapter these authors propose and test a culturally situated model that relates entrepreneurial emotions/passion and cognitions/self-efficacy to explore how these factors impact venture performance, and what implications might follow for research and practice.

Of course, as many cognition scholars (entrepreneurship and beyond) are realizing, the “hardware” that complements the “software” of human thinking/feeling and acting must also figure prominently in dynamic views of cognition – especially with respect to the notion of embodied cognition: where the body influences the mind. The study of entrepreneurial mental “hardware” produces the entrepreneurial neuroscience research stream. Chapters 8 and 9 offer assistance to Handbook readers in beginning to penetrate this physiologically, conceptually, and theoretically complex (but very rich) research domain. Chapter 8, by David Baucus, Melissa Baucus, and Ronald Mitchell offers somewhat of a bridge from the affect-centered research discussion to that of entrepreneurial neuroscience. In this chapter the authors trace in explicit detail the seeing-to-feeling pathways that virtually instantaneously transmit visual stimulus: to produce emotion from within the brains of entrepreneurs. In doing so, the extensive physiology involved is plotted for the ambitious and patient reader, as the authors demonstrate how entrepreneurs’ brains are physiologically the same as most people’s but are different in terms of their experiences and knowledge. Then in Chapter 9, further helping entrepreneurial neuroscience to become approachable for interested readers (beginning with a primer on brain anatomy and neuroscience methods), Jeffery McMullen, Matthew Wood and Les Palich partition the entrepreneurial cognition literature into four distinct explanations of the formation and successful implementation of opportunity beliefs; and they further identify a fifth explanation that points to the future of entrepreneurial neuroscience research.

With behavioral, emotional, and neurological factors having been offered thus far in this Handbook as a platform for penetrating some of the key streams in entrepreneurial cognition research; we may then move, in the next chapter-cluster in this Handbook, toward better

understanding the shaping of entrepreneurial thought. Chapters 10 – 11 provide these insights. In Chapter 10 Daniel Forbes identifies and situates within the entrepreneurial cognition research literature the new and rich set of learning “... resources that help people acquire entrepreneurship-related knowledge.” In particular he proposes a new way of thinking about the advances in large-scale codification processes (media, etc.) and in network formation (markets and other social structures). And because, in part at least, such advanced and specialized symbol systems (as well as even the conceptualization of new opportunity), depend upon language as primary to idea transmission and understanding, we also present Chapter 11, by Jean Clarke and Joep Cornelissen. Their contribution focuses on “... the formative role of language in shaping the ideas of entrepreneurs and their attempts to gain a broader understanding and recognition for a new venture from relevant stakeholders and resource providers.” The provocative idea that language creates opportunities has the scaffolding for such rationale in this chapter.

When taken as a whole, then, we may then say that to this point in the Handbook most of the Chapters have enabled an understanding of entrepreneurial cognition research for the reader who seeks to become conversant in some of the important conversations underway. A few new or expanded conversations are suggested in the last cluster of chapters: Chapters 12 – 14. Andrew Corbett suggests in Chapter 12 that whereas the predominant cognitive perspective extant within both the academic and practitioner world of entrepreneurship research concerns start-ups; that this mental representation is limiting in certain respects, and it thus impinges the development of research targeted toward “... the high and rapid growth ventures that policy-makers hope [to stimulate] for their programs and regions.” His essay therefore develops the concept of *entrepreneurial growth cognitions*. Then in Chapter 13 Ronald Mitchell, Rob Mitchell, Miles Zachary and Michael Ryan further expand the dynamic entrepreneurial cognition conversation by using a simulation to “disembody” and then “re-embody” a very specific set of exchange cognitions to model the socially situated cognition notion, under highly specified conditions: where dynamism in cognition results from the moment-to-moment interaction of an entrepreneur’s inner environment and outer environment – using exchange formation as the relevant outcome. Based upon prior probabilities from an experiment (inner environment) and upon assumptions developed from the literature (outer environment) these authors explore the boundaries of key theoretical assumptions surrounding opportunity formation. Lastly, in our concluding essay, Chapter 14, Saras Sarasvathy presents ideas that open a multiplicity of pathways for future entrepreneurial cognition research carried forward by the exploration of both formal and informal models as tools for entrepreneurial cognition research. The importance of model veracity is also explained. Then, after the foregoing discussion, the theory of effectuation is utilized as a working example of entrepreneurial-cognition-based model building. As Herbert Simon’s last PhD student, Saras is in a unique position to explain how model-building concepts from Simon’s notion of “sciences of the artificial” (1981) can be utilized to unpack behavioral assumptions into models that are high-fidelity embodied representations of entrepreneurs as unique people. We believe this perspective to be highly useful for those looking to the future of entrepreneurial cognition research.

So, like the organizing of an academic conference, the goal of this Handbook has therefore been to empower the participant/reader to craft a singular experience from within a multifaceted conceptual environment. It is our hope that this Introduction to the Handbook is at least a playing-field leveler; a context provider; an experience creator; and hopefully even an inclusion enabler for each colleague who responds to this collective invitation into the field of entrepreneurial cognition research. We promise a richly rewarding engagement.

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Table I.1: Earlier Work on Entrepreneurial Cognition (Up to 1990)

Year	Reference	Excerpt or Summary	Narrative
1755	Cantillon (1755/1931; cited in Hébert & Link, 1989: 42)	... someone who engages in exchanges for profit; specifically, he exercises business judgements in the face of uncertainty.	The entrepreneur is someone who exercises judgment under uncertainty.
1767	Baudeau (1767/1910: 51)	Nothing is more evident, [than that] we need a numerous race of farmers or chief farmers endowed with the knowledge of their art, moved by a great desire to translate their knowledge into action.	Such an exercise of judgment demands desire and specialized knowledge.
1803	Say (1821/1971: 82-83)	... the enormous wealth of Britain is less owing to her own advances in scientific acquirements, high as she ranks in that department, than to the wonderful practical skill of her entrepreneurs ² in the useful application of knowledge . . . science alone is not sufficient to ensure the progress, without the aid of experiment, which is always attended with more or less of risk, and does not always indemnify the entrepreneur, whose profit, even when successful, is moderated by competition.	The knowledge and skill that the entrepreneur possesses must be applied, especially through the action-oriented process of experimentation.
1920	Dewing (1920: 245-254; cited in Palmer, 1971: 33)	Dewing wrote of the qualities of imagination, initiative, judgment, and restraint.	Other qualities such as imagination, restraint, and taking initiative are also important.
1949	Danhof (1949; cited in Palmer, 1971: 33; emphasis in Palmer)	Danhof divides the function of the entrepreneur into three major roles: <i>obtaining relevant information, evaluating the information with regard to profit, and setting the operation in motion</i> . Once the entrepreneur has determined what information should be gathered, the first two functions can be delegated.	Suggests three functions for the entrepreneur. The central role of the entrepreneur is making decisions regarding what types of information is relevant.
1952	Lamb (1952: 91; cited in Palmer, 1971: 33-34)	... entrepreneurship is that form of social decision making performed by economic innovators.	Argues that such decision making is social in nature.
1957	Evans (1957: 50; cited in Palmer, 1971: 33)	... views the entrepreneur as ‘the person or group of persons who has (or assumes) the task of determining the kind of business to be operated.’ The decisions germane to this function involve the nature of the goods and services to be offered, the size of the enterprise, and the customers catered to. Once these decisions have been made by the entrepreneur, other decisions, that is decisions	Proposes that decision making is directed by being continually alert to changing market conditions and opportunities that arise from those changes.

² Prior to the adoption of the French term entrepreneur in English, the word was translated as adventurer. The word entrepreneur is used here.

Year	Reference	Excerpt or Summary	Narrative
		to achieve the previous goals set by the entrepreneur, become essentially management's. ...	
		Evans notes that once these decisions have been made the role of the entrepreneur does not cease: instead, he must be continually alert and ready to make new decisions in light of changing market conditions and arising opportunities.	
1964	McCuire (1964: 238; cited in Palmer, 1971: 34)	Over time, and in different societies, there has evidently been a substantial change in entrepreneurial types, and presumably in the entrepreneur function.	The notion that history and culture are also important factors.
1971	Palmer (1971: 34)	If the functions of the entrepreneur are to be thoroughly understood, all aspects contributing to his behavioral patterns must be considered social, political, economic, and psychological forces.	Calls for a more holistic approach to the study of the entrepreneur.
1973	Kirzner (1973: 9)	... entrepreneurial alertness is crucial to the market process. Disequilibrium represents a situation of widespread market ignorance. This ignorance is responsible for the emergence of profitable opportunities. Entrepreneurial alertness exploits these opportunities when others pass them by.	Further formalizes the idea of alertness by focusing on the role of industry knowledge to exploit profit opportunities.
1975	Schultz (1975: 827)	... education and experience influence the efficiency of human beings to perceive, to interpret correctly, and to undertake action that will appropriately reallocate their resources.	The notion that education and experience can improve the efficiency of perceiving and interpreting information.
1988	Smeltzer, Fann, & Nikotaisen (1988: 61)	It appears that most small business/owner managers who are responsible for both operational and strategic planning conduct environmental scanning regularly Even though these owners do not have a staff for this function, they do not ignore environmental scanning. These owner/managers believe that personal information is more valuable than impersonal information, and informal personal information is deemed most valuable of all.	Finds that not all types of information are equally valuable for alert entrepreneurs: informal, personal information appears to be the worthiest.
	Smith, Gannon, Grimm, & Mitchell (1988: 223)	Entrepreneurs from smaller firms are less comprehensive in their decision behavior than professional managers from larger firms, with comprehensiveness defined as the degree to which an individual follows a formal rational decision process. ... As decision comprehensiveness declines, so too does organizational performance, both among entrepreneurs and professional managers.	Provides evidence against formal/rational decision making views: entrepreneurs are, in fact, not comprehensive in their decision making.
	Cooper, Woo, & Dunkelberg (1988:	Although previous evidence on business survival led to the hypothesis that the entrepreneurs would only be cautiously optimistic, this was not the case. They	Shows that entrepreneurs are generally optimist, i.e., perceive low levels of

Year	Reference	Excerpt or Summary	Narrative
97)		perceived their prospects as very favorable, with 81% seeing odds of 7 out of 10 or better and a remarkable 33% seeing odds of success of 10 out of 10. In considering the prospects for other businesses like their own, they perceived odds which were significantly lower, but still moderately favorable. ... Those who were poorly prepared were just as optimistic as those who were well prepared.	risks.
	Corman, Perles, & Vancini (1988: 38-39)	Two-thirds of the high-technology entrepreneurs interviewed did not perceive exceptionally high levels of risk when making their decision to venture. ... High-tech entrepreneurs, however, tend to be stable, successful, and highly-educated individuals who are not greatly concerned about their ability to secure and maintain employment. Their skills are currently in high demand, and provide alternatives should the current venture fail. Similarly, their education and training have usually allowed them to demand high salaries, thus further reducing perceived financial risk.	Shows that perceiving low levels of risk, in fact, can facilitate decision making.
	Bird (1988: 442)	Entrepreneurial intentions, entrepreneurs' states of mind that direct attention, experience, and action toward a business concept, set the form and direction of organizations at their inception. Subsequent organizational outcomes such as survival, development (including written plans), growth, and change are based on these intentions	Introduces the concept of entrepreneurial intentions as a necessary condition for any entrepreneurial behavior.
1989	Hébert & Link (1989: 47)	The entrepreneur is someone who specializes in taking responsibility for and making judgemental decisions that affect the location, form, and the use of goods, resources, or institutions.	The idea that entrepreneurs are those who become specialized in judgmental decision making.
1990	Hisrich & Jankowicz (1990: 49)	Principal component analyses ... reveal relatively low cognitive complexity: essentially, just one or two major areas of emphasis predominate in each venture capitalist's thinking.	Extends the idea of non-comprehensive decision making to the venture capital context. Shows that low cognitive complexity, rather than specialization, governs VCs decisions.

Table I.2: Current Work on Entrepreneurial Cognition (1990 - Present)

Year	Reference	Excerpt	Narrative
1991	Shaver & Scott (1991: 24, 27-28)	<p>As a discipline, psychology is rarely defined as the sum of the activities of its practitioners. Rather, it is distinguished from other social or behavioral sciences, such as sociology, anthropology, and economics, by its emphasis on the individual person as the level of analysis. Within this concentration on the individual (<i>person</i>), two of psychology's core theoretical concerns have been the contents of mind (the <i>process</i> intervening between external world and observable behavior), and the exercise of free <i>choice</i>. (emphasis in original)</p> <p>... A comprehensive psychological portrait of new venture creation will ultimately have to show how the individual's cognitive representations of the world get translated into action. To accomplish this purpose, it will ultimately be necessary to consider general orienting dispositions (such as attitudes), motivational principles (such as subjective expected utility), and personal motives (such as achievement motivation). It should be noted that choice for a psychologist is not always the same as the rational decision making inherent in economic theory. ... A thorough psychological approach to the study of choices involved in new venture creation must incorporate both the rational and the irrational features of decision making.</p>	<p>Calls for a comprehensive psychological approach to the study of new venture creation. Suggests that such approach will mainly focus on three core issues: (1) the individual entrepreneur, as the level of analysis, (2) the "processes" (in the mind of the individual) through which the external world is translated into action, and (3) the exercise of "choice" (both rational and non-rational decision making).</p>
	Robinson, Stimpson, Huefner, & Hunt (1991: 13)	<p>The attitude model of entrepreneurship, as it is empirically and conceptually presented here, has ramifications for entrepreneurial education and change programs. Because attitudes are open to change, entrepreneurial attitudes may be influenced by educators and practitioners. The tripartite attitude model suggests ways of initiating change by influencing thoughts, feelings, and behavioral intentions (Rosenberg, 1960) with regard to entrepreneurship and related attitudes such as innovation, achievement, self-esteem, and personal control.</p>	<p>The notion that humans "process" information is pursued by showing that such processes can be influenced by changing entrepreneurs' attitudes, as attitudes are susceptible to external impacts.</p>
	Kaish & Gilad (1991: 59)	<p>Entrepreneurs do seem to expose themselves to more information and their alertness takes them to the less obvious places... Our research suggests that the physical volume of search is one distinguishing characteristic of entrepreneurial behavior. (p.59)</p>	<p>Shows empirically that entrepreneurs process more information in their decision making.</p>

Year	Reference	Excerpt	Narrative
1992	Bird (1992: 18)	Temporal brackets, pacing, and market events flow from individual differences, environmental rhythms, and entrepreneurs' cognitions. Thus, an entrepreneur, based on his or her personality, motivations, etc. tunes in to changes in the environment and forms thoughts, feelings, and words that describe the venture that is to be created. Some of these thoughts and behaviors act to bracket the time involved in organization creation and to set a pace for that creation.	Refers to the thought processes of the entrepreneurs as "entrepreneurs' cognition." Defines the concept in relation to the time-based aspects.
	Manimala (1992: 477-478)	Entrepreneurial heuristics were defined as the thumb-rules guiding the management decisions involved in the start-up and management of a new venture ... A regression analysis showed that entrepreneurial orientations... could explain as much as 50% of the variance in innovativeness.	Expands the research on non-rational choice/decision making by coining the concept of "entrepreneurial heuristics." Shows that such heuristics can actually lead to innovativeness.
	Busenitz (1992: iii-iv)	The results of a study of 115 entrepreneurs and 95 managers in large organizations indicate that entrepreneurs are more overconfident in their decision making and that they use the representative heuristic more extensively than managers in large organizations. The results also indicate that the traditional trait approach and situational factors provide only limited help in predicting entrepreneurial activity versus managerial involvement in a large organization.	Provides further evidence for the use of heuristics, such as representative heuristics, in the decisions made by entrepreneurs.
	Katz (1992: 29-30)	This paper proposes a psychosocial cognitive model (PCM) of employment status choice. The model is <i>psychosocial</i> insofar as it utilizes an individual's psychology in the form of values and decision-making processes, and social insofar as it depends on personal history and social context as factors contributing to the decision process. It is <i>cognitive</i> insofar as the decision processes utilize the cognitive heuristics of availability, representativeness, and in a few cases adjustment from an anchor, to describe the process and decision likelihoods of the individual.	Incorporates heuristic-based decision processes with social and psychological factors to propose a psychosocial cognitive model (PCM) of employment status choice.
	McGrath & MacMillan (1992: 419)	... there is a basic set of beliefs that entrepreneurs hold about themselves and about others in their society that, from the perspective of the entrepreneur, differentiate the two. This set of beliefs transcends cultures... that even among culturally very different societies there is a core set of perceptions, common across countries, that entrepreneurs hold about others in their countries.	Finds that entrepreneurs believe they are different from non-entrepreneurs and that such beliefs transcend cultures.
	Chandler & Jansen (1992: 223)	... although self-assessed proficiency in the entrepreneurial function does not appear to be contingent on the length of previous experience as a founder; it does appear to be a necessary component in the development of high-performance companies.	Shows that successful entrepreneurs think they have high levels of competencies in creation of novel ventures.

Year	Reference	Excerpt	Narrative
	Hansen & Allen (1992: 63)	For intending entrepreneurs, managing the emergence of their pre-organizations may be an important pre-step to the creation of their new organization. Entrepreneurs would appear to improve their ability to create new organizations when they establish pre-organizational information-accessing and processing capabilities that are appropriate to their respective levels of environmental load.	The idea is developed that entrepreneurs' thought processes, i.e., their information processing capabilities and thinking skills, can be enhanced, even before individuals engage in organization creation activities.
1993	Bull & Willard (1993: 183)	<p>We offer the following tentative entrepreneurship theory, extracted from anecdotal observations and extant literature, in the hope that it will better explain and begin to predict the phenomenon of entrepreneurship:</p> <p>“A person will carry out a new combination, causing discontinuity, under conditions of:</p> <ol style="list-style-type: none"> 1. Task-related motivation, 2. Expertise, 3. Expectation of personal gain, and 4. A supportive environment.” 	Proposes that expertise is one of the necessary elements for entrepreneurs to succeed.
	McCarthy, Schoorman, & Cooper (1993: 9)	Ongoing research in decision-making suggests that psychological processes may play a role in influencing ... [reinvestment] decisions. Under certain conditions entrepreneurs may be influenced by a phenomenon termed “escalation of commitment.” This may lead entrepreneurs to decide to expand the asset bases of their firms, regardless of feedback from the marketplace.	Under certain conditions, entrepreneurs may not process negative feedback / information, due to the phenomenon of escalation of commitment.
	Krueger & Carsrud (1993: 315)	Planned behaviours such as starting a business are intentional and thus are best predicted by intentions toward the behaviour, not by attitudes, beliefs, personality or demographics... Intentions fully mediate the relationship between attitudes and the target behaviour, even where attitudes may appear to explain behaviour. Intentions entail an enactive cognitive process which serves to channel beliefs, perceptions and other exogenous factors into the intent to act, then to the action itself.	Further expands intention-based approaches by arguing that intentions channel beliefs and perceptions into the intent to act and, thereby, to the actions.

Year	Reference	Excerpt	Narrative
	Krueger (1993: 17)	This exploratory study found significant support for Shapero's propositions that entrepreneurial intentions derive largely from (1) perceptions of feasibility, (2) perceptions of desirability, and (3) a propensity to act which derives from control beliefs. Path analysis demonstrated that the impact of prior entrepreneurial exposure on intentions is indirect, operating through perceived feasibility. The positiveness of those experiences also indirectly influences intentions through perceived desirability.	Finds empirical supports for the proposition that intentions, in fact, channel beliefs and perceptions into actions.
1994	Boyd & Vozikis (1994: 63)	This paper further develops Bird's model of entrepreneurial intentionality by suggesting that individual self-efficacy, which has been defined as a person's belief in his or her capability to perform a task, influences the development of both entrepreneurial intentions and actions or behaviors.	Introduces the concept of self-efficacy and argues that it plays in the thought processes of entrepreneurs, as it precedes intentions.
	Krueger & Dickson (1994: 396)	We found support for our hypotheses that an increase in self-efficacy increases perceptions of opportunity and decreases perceptions of threat and that changing opportunity and threat perceptions changes risk taking.	Finds that increased self-efficacy increases perceptions of opportunity and risk taking behavior, e.g., intentions to act.
	Krueger & Brazeal (1994: 96, 102)	Perceived feasibility in SEE [Shapero's Model of the "Entrepreneurial Event"] corresponds to perceived behavioral control in TPB [Theory of Planned Behavior] (both correspond to perceived self-efficacy); TPB's other two attitude measures are subsumed by SEE's perceived desirability. Our most important conclusion, though, remains the primacy of perceived feasibility. Given that conclusion, we need to research what factors contribute the most to perceptions of feasibility.	Based on psychological factors such as self-efficacy and attitude, offers an overarching model of entrepreneurial potential.
	Mitchell (1994: 163)	The research conducted in this dissertation (1) investigates three key literature streams in entrepreneurship research and specific theories within those streams, (2) suggests the in-depth exploration of expert information processing theory (EIPT), and (3) encourages the integration of these two fields to propose a theory of new venture formation expertise.	Further formalized the notion of expertise by introducing the term "entrepreneurial expertise." Suggests a cognitive-based model by which entrepreneurs can be distinguished from non-entrepreneurs.
	Reuber & Fischer (1994: 372-373)	The findings reported here indicate that 1) owners' expertise is more strongly correlated with firm performance than is owners' experience; 2) different types of expertise are associated with different types of experience; and 3) there is some direct association (net of expertise) of experience on firm performance.	Argues and empirically demonstrates that experience measures are inadequate surrogates for expertise.

Year	Reference	Excerpt	Narrative
1995	Cooper, Folta, & Woo (1995: 107)	It was found that those who had no entrepreneurial experience, on the average, sought more, not less, information. However, as expected, those who ventured into fields which were different and those who had higher levels of initial confidence sought less information. ... [N]ovice entrepreneurs searched less extensively in unfamiliar domains, a behavior consistent with bounded rationality. By contrast, experienced entrepreneurs did not vary their search pattern. It was also found that entrepreneurs having high levels of confidence sought less information, as expected.	Shows that novice and experienced entrepreneurs have different search strategies.
	Mitchell & Chesteen (1995: 301, 302)	... expertise can be acquired through an individual's participation in specific processes such as significant study, experience, and the exposure to schemata through contact with experts. Whereas the general design of the educational courses described in this study optimizes a student's capability to apply the principles and practices of entrepreneurship in a business setting, the activities of the script-based experiential instructional strategy were tailored specifically to boost the student's readiness to venture by enhancing entrepreneurial expertise. ... the results suggest that venture expertise can be stimulated effectively <i>within</i> the instructional setting by the planned series of experiential activities involving contact with experts. (emphasis in original)	Demonstrates that entrepreneurial expertise can be enhanced more by experiential entrepreneurial instruction pedagogy than by traditional business plan approach.
	Gatewood, Shaver, & Gartner (1995: 371)	The purpose of this study was to explore whether certain cognitive factors of potential entrepreneurs (as measured by a personal efficacy scale and the kinds of reasons people offer for their decision to undertake efforts to start a business) can be used to predict their subsequent persistence in business start-up activities and in new venture creation success. ... An analysis of the results found that internal/stable attributions, (e.g., "I have always wanted to be my own boss") was supported for female potential entrepreneurs, whereas external/stable attributions (e.g., "I had identified a market need") were significant for male potential entrepreneurs.	Shows that self-efficacy is important for subsequent persistence in start-up activities.
	Palich & Bagby (1995: 426)	...entrepreneurs categorized equivocal business scenarios significantly more positively than did other subjects, and... these perceptual differences were consistent and significant (i.e., entrepreneurs perceived more strengths versus weaknesses, opportunities versus threats, and potential for performance improvement versus deterioration).	Finds that entrepreneurs generally perceive more strengths and opportunities than weaknesses and threats, when working on business scenarios.

Year	Reference	Excerpt	Narrative
1996	Busenitz & Lau (1996: 33)	... a person's cognition significantly affects start-up intentions. The cross-cultural cognitive model developed in this paper also acknowledges that entrepreneurial cognition is affected by cultural values, social context, and some personal variables. The schema (knowledge structure) of a founder contains the information needed to arrive at the start-up decisions and the cognitive process determines how information is utilized.	Develops a cross-cultural model of venture creation decision. Argues that an individual's cognition significantly affects his/her start-up intentions.
	Kolvereid (1996: 23)	This research developed a classification scheme of reasons given for preferring self-employment versus organizational employment. ... The classification scheme that emerged questions the relevance of earlier models, which have been used to explain and predict occupational status choice.	Individuals provided different reasons for their career choice intentions. A taxonomy is developed based on these reasons.
	Busenitz (1996: 42-43)	... Kaish and Gilad (1991) study recently tested Kirzner's (1973) theory of alertness which asserts that entrepreneurs are more alert to new opportunities and use information differently. Because of the lack of generalizable samples and the exploratory nature of the Kaish and Gilad study, this research replicated and further developed some of the scales originally developed by them. The results indicated that little empirical support exists for this theoretical framework, but the measures of entrepreneurial alertness need further development.	Provides empirical evidence that challenges the theory of alertness. Finds that entrepreneurs are not more alert than non-entrepreneurs.
1997	Mitchell (1997: 136)	To insiders, entrepreneurship is not for the few. Entrepreneurship is for the many—albeit the many who have sufficient discipline to learn and abide by the tried-and-true norms of the venturing expert script.	Demonstrates that by learning expert scripts, novice entrepreneurs can become experts.
	Jenkins & Johnson (1997: 895)	This paper uses a causal map methodology to consider the contrasts between entrepreneurial intentions and outcomes. In evaluating a series of propositions drawn from the extant literature the study finds that the elicited causal maps are consistent with contrasts in entrepreneurial intentions, but not outcomes. This suggests that the existing emphasis on entrepreneurial strategies being deliberate, conscious processes may be misplaced: non-deliberate, emergent strategies may be just as influential in producing entrepreneurial outcomes.	Expanding the research on heuristics, demonstrates that emergent, non-deliberate strategies may be just as effective as deliberate ones in producing positive outcomes.
	Busenitz & Barney (1997: 9)	Under conditions of environmental uncertainty and complexity, biases and heuristics can be an effective and efficient guide to decision-making. In such settings, more comprehensive and cautious decision-making is not possible, and biases and heuristics may provide an effective way to approximate the appropriate decisions.	Further develops the notion of entrepreneurial heuristics. Shows that entrepreneurs are more susceptible to the use of heuristics due to uncertainty and complexity in their environment.

Year	Reference	Excerpt	Narrative
1998	Baron (1998: 288)	The major themes of this article can be summarized as follows: (1) entrepreneurs' thinking may differ, in important ways, from that of other persons; specifically, they may be more susceptible to various kinds of cognitive errors or bias than other persons, and (2) such differences in cognition do not stem primarily from differences between entrepreneurs and other people with respect to personal traits (although such differences may well exist), but rather from the fact that entrepreneurs operate in situations and under conditions that would be expected to maximize such errors or biases.	Argues that entrepreneurs are susceptible to cognitive biases, because of the demand of the situation, i.e., because their environment overloads their information-processing capacity.
	Chen, Greene, & Crick (1998: 295)	[Self-efficacy] refers to the strength of a person's belief that he or she is capable of successfully performing the various roles and tasks of entrepreneurship. It consists of five factors: marketing, innovation, management, risk-taking, and financial control.	Further develops and finds empirical support for the construct of entrepreneurial self-efficacy.
	Pineda, Lerner, Miller, & Phillips (1998: 60)	The results suggest that the more important the decision and the more the manager perceives himself or herself to be effective in making a particular type of decision, the greater the intensity of the information search, and the greater the use of external information sources during decision-making.	Shows that high self-efficacy in decision making increases the level of information search.
1999	Busenitz (1999: 325)	... entrepreneurial risk may be explained by recognizing that entrepreneurs use biases and heuristics more, which is likely to lead them to perceive less risk in a given decision situation.	Demonstrates that a higher level of reliance on heuristics can explain the risk-taking behavior.
	McGrath (1999: 16)	Changing one's perception of failure can require adjusting fundamental assumptions regarding performance. As March and Shapira (1987) observe, failure as manifested in risk taking that goes badly is considered undesirable. Therefore, people seek success and avoid failure, and those efforts can introduce errors in learning and interpretation processes. Paradoxically, such errors often make failure more likely or more expensive than it need have been (see Levinthal & March, 1993). Errors fall into three broad categories: (1) errors caused by extrapolating to the future from past success, (2) errors owing to cognitive bias, and (3) errors introduced through interventions to avoid the occurrence or appearance of failure.	Argues for the importance of failure in the development of the interpretation processes of individuals, as failure provides learning opportunities for entrepreneurs.
2000	Mitchell, Smith, Seawright, & Morse (2000: 986)	[T]he study was successful in demonstrating that cognitive scripts explain a significant amount of variance in venture creation decisions... [T]he results are consistent with theory that suggests that entrepreneurs in different cultures look first to arrangements scripts to evaluate potential entry into the venture creation decision process, and only then utilize doing-related scripts.	Finds support for the proposition that across cultures, cognitive scripts can explain a significant amount of variance in decisions to create ventures.

Year	Reference	Excerpt	Narrative
	Krueger (2000: 5)	Before we can act on opportunities we must first identify those opportunities. Understanding what promotes or inhibits entrepreneurial activity thus requires understanding how we construct perceived opportunities... Based on well-developed theory and robust empirical evidence, we propose an intentions-based model of the cognitive infrastructure that supports or inhibits how we perceive opportunities.	A conceptual model of how entrepreneurs form intentions and construct opportunities based on their perceptions of exogenous factors is developed.
	Simon, Houghton, & Aquino (2000: 113-114)	The study's findings suggest that risk perceptions may differ because certain types of cognitive biases lead individuals to perceive less risk... individuals start ventures because they do not perceive the risks involved, and not because they knowingly accept high levels of risks. The belief in the law of small numbers lowered an individual's perceptions of a venture's riskiness....	Provides support for the notion that individuals decide to start ventures partly due to the fact that they do not perceive the whole array of risks that are involved.
	Wright, Hoskisson, Busenitz, & Dial (2000: 592, 597-598)	We build a new model to explain incentive differences from agency theory (short term versus long term) and describe how fundamental differences in individual cognitive orientation (managerial versus entrepreneurial) can be combined to explain different strategic buyout attributes.	Combines individual cognitive orientation with agency theory to explain different strategic buyout attributes.
		Heuristic-based logic in decision making is very economical and usually provides valuable estimations of the entrepreneurial decisions (Tversky & Kahneman, 1974), especially because of the scarcity of quantifiable information available for a more rational decision... [However,] in the face of uncertainty and ambiguity, a heuristic-based logic may lead to bad decisions... severe errors (Tversky & Kahneman, 1974)... [and] firm failure (...Wright et al., 1991).	
	Baron (2000: 80)	Empirical results indicated that entrepreneurs were significantly less likely to engage in counterfactual thinking, experienced significantly less regret over past events, and found it significantly easier to admit past mistakes both to themselves and to others.	Finds that entrepreneurs often take a strong future-oriented perspective, which may decrease their propensity to reflect on past events.
2001	Alvarez & Busenitz (2001: 755)	We extend the boundaries of resource-based theory to include the cognitive ability of individual entrepreneurs. Entrepreneurs have individual-specific resources that facilitate the recognition of new opportunities and the assembling of resources for the venture.	The idea is developed that cognitive abilities of entrepreneurs are one valuable, rare resource for venture creation.

Year	Reference	Excerpt	Narrative
	Gaglio & Katz (2001: 95-96)	Entrepreneurial alertness, a distinctive set of perceptual and information-processing skills, has been advanced as the cognitive engine driving the opportunity identification process... To date, empirical support for the construct has been equivocal, leading at least one scholar (Busenitz, 1996) to question its value. However ... this may follow in part from an unduly narrow approach to the operationalization of theory as well as a potential problem in the match of the psychometric method to the type of phenomenon being studied.	Advances the concept of entrepreneurial alertness as the cognitive engine that drives the process of opportunity identification.
	Sarasvathy (2001: 262)	The essential agent of entrepreneurship, as I argue here, however, is an effectuator: an imaginative actor who seizes contingent opportunities and exploits any and all means at hand to fulfill a plurality of current and future aspirations, many of which are shaped and created through the very process of economic decision making and are not given a priori.	Introduces the logic of effectuation and proposes that expert entrepreneurs follow such logic.
2002	Mitchell, Busenitz, Lant, McDougall, Morse, & Smith (2002)	We define entrepreneurial cognitions as follows: <i>entrepreneurial cognitions are the knowledge structures that people use to make assessments, judgments, or decisions involving opportunity evaluation, venture creation, and growth.</i> In other words, research in entrepreneurial cognition is about understanding how entrepreneurs use simplifying mental models to piece together previously unconnected information that helps them to identify and invent new products or services, and to assemble the necessary resources to start and grow businesses. (emphasis in original)	A formal definition for entrepreneurial cognitions is proposed to help direct the future research.
	Mitchell, Smith, Morse, Seawright, Peredo, & McKenzie (2002: 9)	We find...that individuals who possess “professional entrepreneurial cognitions” do indeed have cognitions that are distinct from business non-entrepreneurs... ... we report further confirmation of a universal culture of entrepreneurship... ... we find (a) observed differences on eight of the ten proposed cognition constructs, and (b) that the pattern of country representation within an empirically developed set of entrepreneurial archetypes does indeed differ among countries.	Shows that there exists a cognitive explanation for entrepreneurial phenomena that is universal and cross-cultural.
	Fiet (2002: 221)	I began this book by asserting that the discovery process was at the heart of entrepreneurship... If skeptics were saying that acquiring entrepreneurial competence is a passive process that occurs solely as a result of being lucky, this book has taken aim at this argument and hopefully debunked it to your satisfaction. Acquiring competence may occur accidentally to a large extent. However, I have tried to show that it is possible to train entrepreneurs to make discoveries, which increases their competence.	Further develops the idea that the discovery process is crucial to the success of a new venture creation and that such competency can be enhanced using training.

Year	Reference	Excerpt	Narrative
	Simon & Houghton (2002: 105)	... entrepreneurs in smaller, younger, firms, who are considering pioneering, are more likely to exhibit illusion of control, law of small numbers, and reasoning by analogy. These biases contribute to underestimating competition, overestimating demand, and overlooking requisite assets.	Suggests that entrepreneurs' decision environments vary greatly and that such variation influences the types of biases that arise.
2003	Markman & Baron (2003: 281)	... to the extent entrepreneurs are high on a number of distinct individual-difference dimensions (e.g., self-efficacy, ability to recognize opportunities, personal perseverance, human and social capital, superior social skills) the closer will be the person-entrepreneurship fit and, consequently, the greater the likelihood or magnitude of their success.	Argues that individuals with higher levels of self-efficacy, perseverance, and social skills are more likely to have fit with entrepreneurship phenomena.
2004	Gaglio (2004: 533, 547)	<p>The cognitive processes of mental simulation and counterfactual thinking are proposed as mechanisms by which entrepreneurs identify and develop innovative opportunities.</p> <p>With the right methodology, in which entrepreneurs do the thinking rather than recall previous experience (Ericsson & Simon, 1994; Gaglio & Katz, 2001), it becomes possible to punch a hole in the black box regarding the cognitive work associated with the opportunity identification process and to test the assertions made by the theory of entrepreneurial alertness. The area of opportunity identification can move beyond the descriptive phase and begin to consider questions about dynamics and contingencies.</p>	Suggests that two cognitive heuristics of mental simulations and counterfactual thinking, may guide entrepreneurial reasoning and enhance the opportunity identification process.
2005	Baker & Nelson (2005: 329, 356-357)	<p>... found that Lévi-Strauss's concept of bricolage—making do with what is at hand—explained many of the behaviors observed in small firms in resource-poor environments that were able to create something from nothing by exploiting physical, social, or institutional inputs that other firms rejected or ignored.</p> <p>The refusal to enact environmental limitations helps firms use bricolage to create something from nothing... however, when this is taken to an extreme, identities and communities of practice that are constructed create a new set of limitations that suppress growth. In contrast, when firms use bricolage more narrowly or temporarily..., they appear to be more likely to grow.</p>	Introduces the concept of entrepreneurial bricolage. Shows that entrepreneurs sometimes refuse to accept environmental limitations, which allows them to meet environmental challenges.

Year	Reference	Excerpt	Narrative
	Cardon, Zietsma, Saporito, Matherne, & Davis (2005: 25)	We suggest that relational metaphors can provide new insight into our understanding of entrepreneurial activities and shed light on aspects of entrepreneurship that seem illogical from a rational perspective, that is, cognitive biases that reduce the perception of risks (love may be blind), entrepreneurial persistence despite poor results (some parents never give up, even when perhaps they should), often extreme devotion to the business entailing self-sacrifice and delayed gratification, and the separation problems that sometimes accompany founder succession. A parenting metaphor highlights the importance of passion (i.e., strong emotions and enthusiasm) and identification (i.e., close association and connection) between an entrepreneur and a venture.	Argues that using the lens of affect can inform prior research on cognition through use of a metaphor that illustrates the limits of a solely rational perspective of cognition.
	Corbett (2005: 473, 484, 485)	<p>This article makes connections between knowledge, cognition, and creativity to develop the concept of learning asymmetries.</p> <p>Individuals with different learning preferences may identify and exploit opportunities differently. Individuals with a convergent learning preference will be more likely to develop an initial solution or idea.</p> <p>Individuals with assimilative learning preference will be more likely to develop more options or opportunities for products from a platform of initial ideas... Individuals with divergent learning preference will be more likely to develop a workable business prototype from a number of different options; individuals with accommodative learning preference will be more likely to successfully exploit working prototypes.</p>	A conceptual model of entrepreneurial learning is proposed and the concept of learning asymmetries is introduced.
	Forbes (2005: 623)	Results show that individual age, firm decision comprehensiveness and external equity funding affect the degree to which entrepreneurs are overconfident. In addition, founder-managers are shown to be more overconfident than are new-venture managers who did not found their firms. The results suggest that entrepreneurs' cognitive biases are a function of both individual and contextual factors.	Demonstrates that entrepreneurs tend to display overconfident bias due to both differences in individual characteristics and the organizational contexts in which they operate.
	Mitchell (2005: 187)	I... demonstrate that as a global society we have, in certain ways, been wrong in our approach to entrepreneurship education (both informal and formal), and that a course correction (pun intended is needed... I outline... the relationship between education and high-performance to support the argument that entrepreneurs are special, but are not created in the way that is commonly believed: that there is, in actuality, a general process for creating them. I present and discuss the international implications of the emerging "practice school" of entrepreneurship education for reforming the creation of global entrepreneurs.	Suggests that there is a common process known for creating entrepreneurial expertise: while entrepreneurs are special, creating them is general.

Year	Reference	Excerpt	Narrative
	Mitchell, Friga, & Mitchell (2005: 653)	Entrepreneurial intuition is poorly defined in the literature that the intuitive is confused with the innate, what is systematic is overlooked, and unexplained variance in entrepreneurial behavior remains high... We (1) bound and define the construct of entrepreneurial intuition within the distinctive domain of entrepreneurship research; (2) apply a levels-of-consciousness logic and process dynamism approach to; (3) organize definitions, antecedents, and consequences; and (4) produce propositions that lead to a working definition of entrepreneurial intuition.	Points to the importance of intuition in the thought processes of entrepreneurs. Renders entrepreneurial intuition more usable for future studies.
	Shepherd & DeTienne (2005: 91)	Results suggest that while prior knowledge of customer problems leads to the identification of more opportunities and opportunities that are more innovative, it also moderates the relationship between potential financial reward and opportunity identification... the less knowledgeable an individual was about customer problems, the more positive the effect that potential financial reward had on the number of opportunities identified and the innovativeness of those opportunities.	Finds supports for the argument that prior knowledge of a field allow individuals to identify more “valuable” opportunities.
2006	Baron (2006: 104)	...entrepreneurs identify opportunities for new business ventures... by using cognitive frameworks they have acquired through experience to perceive connections between seemingly unrelated events or trends in the external world... This pattern recognition perspective on opportunity identification... helps integrate into one basic framework three factors that have been found to play an important role in opportunity recognition: engaging in an active search for opportunities; alertness to them; and prior knowledge of an industry or market... helps explain why some persons, but not others, identify specific opportunities... [It] suggests specific ways in which current or would-be entrepreneurs can be trained to be better at recognizing opportunities.	Proposes that entrepreneurs identify opportunities by using cognitive frameworks that allow them to identify patterns among seemingly unrelated events, i.e., to connect the dots.
	Baron & Ensley (2006: 1331)	New business opportunities are identified when entrepreneurs, using relevant cognitive frameworks, “connect the dots” between seemingly unrelated events or trends and then detect patterns in these connections suggestive of new products or services. The prototypes of experienced entrepreneurs were more clearly defined, richer in content, and more concerned with factors and conditions related to actually starting and running a new venture (e.g., generation of positive cash flow) while that of novice entrepreneurs were more strongly emphasize attributes less directly related to business processes (e.g., the novelty or uniqueness of new products or services).	The pattern recognition framework proposed above is supported empirically.

Year	Reference	Excerpt	Narrative
	Pech & Cameron (2006: 61)	This [information-processing] framework demonstrates how various entrepreneurial needs and attitudes, as well as entrepreneurial motivators, impact on the diagnosis and assessment of informational cues. It describes how opportunity-related information is processed by entrepreneurs in order to reach a decision of acceptance or rejection of potential business opportunities... Entrepreneurs have a heightened ability and awareness for recognizing and audaciously exploiting business opportunities. They persistently and continually seek opportunity-laden information in order to satisfy internal motivators such as need for achievement and the fulfillment of competitive urges.	Constructs an information-processing framework of entrepreneurial opportunity recognition.
2007	Bingham, Eisenhardt, & Furr (2007: 40)	Our core contribution is the insight that heuristics are at the heart of high performing organizational processes, and so are central to firm capabilities. Specifically, we find that high performing organizational processes consist of heuristics – i.e., informal rules-of-thumb that center on the capture of opportunities within flows of process-specific opportunities (e.g., new countries, acquisition targets, or product development projects). We also find that more heuristics relate to higher process performance. Moreover, high performing organizational processes consist of particular types of heuristics.	Applies the concept of heuristics in the context of firm capability and finds significant relationships between the two.
	Brigham, De Castro, & Shepherd (2007: 29)	Regression analyses indicated higher satisfaction and lower intentions to exit for owner-managers whose dominant decision-making style complemented the levels of formalization and structure in their firms. In addition... both satisfaction and intentions to exit were significantly associated with actual turnover.	Introduces the concept of cognitive styles to the literature and finds that entrepreneurs' cognitive styles affect their decisions.
	Busenitz & Arthurs (2007: 147-148)	One of the benefits of looking at both entrepreneurial and dynamic capabilities in the context of entrepreneurial ventures is that we are able to better articulate the nature of dynamic capabilities... Although making firm-level adjustments to fit with the environment has been an anchor of the dynamic capabilities literature, what parts of those adjustments are specific to dynamic capabilities and which ones are a regular part of organizational life has been less clear.	Draws a firmer distinction between the entrepreneurial and dynamic capabilities.
	Corbett & Hmieleski (2007: 103)	... we examine the interplay and divergence between the role schema of individuals in corporations and the expert event schemas necessary to launch a new venture.... We then construct a theoretical framework for explaining why this tension results in corporate entrepreneurs emphasizing certain event schemas in a manner that is distinct from independent entrepreneurs' role schemas.	Proposes a framework about how the corporate context can create tension between corporate entrepreneurs' role schemas and the event schemas necessary for new venture emergence.

Year	Reference	Excerpt	Narrative
Corbett (2007: 97)		Discovering entrepreneurial opportunities requires that individuals not only possess some form of prior knowledge, but that they also have the cognitive abilities that allow them to value and exploit that knowledge... After analyzing the empirical data, the article develops the concept of learning asymmetries and explains how the manner in which people learn may affect their ability to identify entrepreneurial opportunities.	Further develops the concept of learning asymmetries and finds a significant relationship between opportunity identification and learning.
Corbett, Neck, &	DeTienne (2007: 829)	... we advance the literature on entrepreneurial human capital by linking cognitive scripts used by corporate entrepreneurs in project termination decisions to corresponding levels of learning... [L]ongitudinal investigation suggests that corporate entrepreneurs use three types of termination scripts: (1) undisciplined termination, (2) strategic termination, and (3) innovation drift.	Finds that organizational learning is dependent upon the type of termination script employed.
Dimov (2007a: 713)		This article helps develop the creativity perspective within entrepreneurship in two ways. First, it elaborates on the nature of opportunity as a creative product. Rather than viewing opportunities as single insights, it suggests that they are emerging through the continuous shaping and development of (raw) ideas that are acted upon. Second, rather than attributing them to a particular individual, it highlights the contextual and social influences that affect the generation and shaping of ideas. This helps move entrepreneurship research beyond the single-person, single-insight attribution that currently permeates it.	Coins the concept of opportunity development—as a socially constructed process of venture creation in which, initial ideas are elaborated, refined, changed, or discarded as a result of learning that arise from continually shaping, discussion, and interpretation of ideas.
Dimov (2007b: 579)		This paper reinforces the importance of the intersection between learning and entrepreneurship by showing that the individuality of learning and its situated nature play key enabling roles in the formation of opportunity intentions. Even if equally motivated toward entrepreneurial achievements, individuals differ not only in the nature of ideas they generate in a particular situation, but also in the perceived feasibility of these ideas. In addition, it also bridges the different ontological traditions in which the study of opportunities is currently based... Finally, this paper shows that integrating individual and situational factors in the study of entrepreneurial learning adds an important dimension to our understanding of opportunity development as a learning process.	Demonstrates how the subjective nature of learning and its situated character play important and enabling roles in the formation of intentions.

Year	Reference	Excerpt	Narrative
2008	Baron (2008: 329)	First, the environments in which entrepreneurs function are often highly unpredictable and filled with rapid change ... Research on the influence of affect suggests that it is most likely to exert powerful effects on cognition and behavior in precisely this type of situation. In contexts involving high uncertainty and unpredictability, affect can readily tip the balance toward specific actions or decisions—effects it might not produce in environments that are more certain and predictable ... A second reason why affect may often exert strong effects in the domain of entrepreneurship relates to the specific tasks entrepreneurs perform in starting new ventures. These tasks are highly varied in nature and change significantly as the process unfolds ... [and] are ones that have previously been shown to be strongly influenced by affect ... affect has been shown to exert strong effects on creativity ... on persuasion ... on decision making and judgments ... and on the formation of productive working relationships with others...	Suggests that affect is important to entrepreneurial cognition and behavior and that its importance is shaped by both the environment and the task.
	Cardon (2008: 78)	Drawing from the psychological literature on emotions and feelings ... and emotional contagion ... as well as literature on transformational leadership ... we build a model of emotional contagion within the entrepreneurial context, from entrepreneurs to employees. ... we discuss entrepreneurial passion in general ... how it leads to the emotional displays of entrepreneurs ... build a model of emotional contagion, drawing a distinction between contagion through primitive emotional mimicry and through social comparison processes. We ... ultimately suggest that for contagion of passion from entrepreneur to employee to occur, employees must experience both positive intense feelings for their activities and a sense of meaningfulness or identity connection to those activities within the entrepreneurial firm.	Proposes a model of how affect (entrepreneurial passion in particular) is transferred to employees through physical mimicry and social comparison.
	Hmieleski & Corbett (2008: 45)	...entrepreneurial intentions are found to be significantly associated with measures of personality, motivation, cognitive style, social models, and improvisation... The results of hierarchical regression show that improvisation accounts for a significant amount of variance in entrepreneurial intention above and beyond what is accounted for by the other variables.	Demonstrates a strong relationship between entrepreneurial intentions and improvisation.
2009	Bingham (2009: 321)	Firms with more successful foreign market entries decrease improvisation in opportunity selection but increase improvisation in opportunity execution... Intriguingly, data suggest that increased improvisation in opportunity execution may be influenced by decreased improvisation in opportunity selection, whereas decreased improvisation in opportunity execution may be influenced by increased improvisation in opportunity selection.	Finds a dynamic relationship between the level of improvisation in opportunity selection and in opportunity execution.

Year	Reference	Excerpt	Narrative
Cardon (2009: 511-512)	We first address what passion is by proposing a definition of the entrepreneurial passion concept based on psychological research on emotions ... and on identity ... as well as grounded work in entrepreneurship. Second, we address what passion does by proposing a conceptual framework to theorize the mechanisms that coordinate the influence of role-identity-specific passion on entrepreneurs' cognitions and behaviors in the pursuit of entrepreneurial effectiveness ... We use self-regulation as an overall theoretical framework to extract empirically testable propositions.	Applies self-regulation theory to develop a theory of the cognitive and behavioral consequences of entrepreneurial passion.	
Dew, Read, Sarasvathy, & Wiltbank (2009: 287, 296)	<p>... entrepreneurial experts frame decisions using an “effectual” logic (identify more potential markets, focus more on building the venture as a whole, pay less attention to predictive information, worry more about making do with resources on hand to invest only what they could afford to lose, and emphasize stitching together networks of partnerships); while novices use a “predictive frame” and tend to “go by the textbook.”</p> <p>Overall results show significant evidence of expert–novice differences as well as differences in logical framing.</p>	Finds that expert entrepreneurs are more likely to use effectual logic than novice entrepreneurs.	
Foo, Uy, & Baron (2009: 1086-1087)	<p>... we use the affect-as-information perspective as a theoretical foundation for understanding how affect influences entrepreneurial effort ... [and] clarify the nature and direction of the affect– effort relationship ... We find that negative affect predicts new venture effort ... we also find that positive affect predicts new venture effort. [and suggest] ... that although positive affect signals that all is going well, it does not necessarily reduce effort. Instead, we clarify the mechanism behind the affect– effort relationship by showing that positive affect is linked to increased effort through a future temporal focus ... this is one of the first studies to show that affect matters in the domain of entrepreneurship.</p>	Empirically demonstrates the importance of both positive and negative affect to entrepreneurial action.	
Read, Dew, Sarasvathy, Song, & Wiltbank (2009: 1)	The results show significant differences in heuristics used by expert entrepreneurs and by managers to approach marketing in the face of uncertainty. While managers rely primarily on predictive techniques to make marketing decisions, expert entrepreneurs tend to... use an effectual or non-predictive logic to tackle uncertain market elements and to construct novel markets with committed stakeholders.	Provides further support for effectual logic. Shows that expert entrepreneurs are more likely to use effectual logic, e.g., focus on intangible resources, co-creation of value, and stakeholder relationships.	

Year	Reference	Excerpt	Narrative
	Read, Song, & Smit (2009)	In this study, we conduct a meta-analysis of the articles published in the Journal of Business Venturing, summarizing data on 9897 new ventures to connect three of the principles of effectuation positively with new venture performance. In so doing, we offer both specific insight into precisely measuring effectuation and a general method for extracting variables from prior work to measure new constructs.	Develops a way to measure effectuation logic. Finds that most of the principles of effectual logic are positively related to new venture performance.
	Mitchell, Mitchell, & Mitchell (2009: 131)	... successful new venture formation is associated with individual knowledge-based scripts... As the previous 15 years have demonstrated, the link between expertise and new venture formation is very useful in helping entrepreneurship researchers illuminate the underlying dynamics of new venture formation.	Describes a prototypical approach for identifying the script-based components of new venture formation expertise and for distinguishing entrepreneurial expertise in individuals.
	Shepherd & Cardon (2009)	An inverse U-shaped relationship was detected between the proportion of failed businesses relative to the number of businesses owned and the number of opportunities identified in a given period. Business failure experience was not associated with the innovativeness of exploited opportunities. ... beyond a certain level, the benefits associated with prior business ownership experience may be outweighed by the biases that can stem from experience.	Finds an inverse U-shape relationship between experience and failure and cautions about the over-reliance on prior experience in opportunity identification.
2010	Grégoire, Barr, & Shepherd (2010: 413, 424-425)	In contrast to prior research [e.g., Baron & Ensley, 2006], the qualitative and quantitative data do not provide evidence that individuals use prototypes to recognize opportunities. Instead, we find that different kinds of mental connections--structural alignment--play different roles in the process of recognizing opportunities, with different consequences. ... the significance of our findings lies not in observing that executive entrepreneurs find opportunities by matching technology with market, but rather that their matching of technology and market involves their aligning the superficial features and structural relationships of technology and market to one another.	Challenges the notion that entrepreneurs employ prototypes to recognize opportunities. Demonstrates, instead, that recognizing opportunities involves cognitive processes of structural alignment.

Year	Reference	Excerpt	Narrative
	Haynie, Shepherd, Mosakowski, & Earley (2010: 217-218)	We develop a framework of entrepreneurial metacognition to investigate the foundations of an ‘entrepreneurial mindset’...[This model] offers important insights into entrepreneurial thinking and behaviors; the dynamism and uncertainty inherent in an entrepreneurial context requires entrepreneurs to continuously ‘rethink current strategic actions, organization structure, communications systems, corporate culture, asset deployment, investment strategies, in short every aspect of a firm's operation and long-term health (Hitt et al., 1998: 26)’ in the context of a contemporary business environment.	Develop a conceptual framework of entrepreneurial metacognition. Suggests that entrepreneurial mindset is metacognitive in nature; thus, it enables entrepreneurs to formulate “higher-order” cognitive strategies and to promote adaptable cognitions.
2011	Mitchell, Randolph-Seng, & Mitchell (2011: 774)	To date, entrepreneurial cognition has been explained largely in terms of what social cognition researchers commonly term boxologies: seemingly static representations of abstract, disembodied cognitive structures (e.g., biases, heuristics, scripts, etc., as described in Mitchell et al., 2007)...We... extend Cornelissen and Clarke’s [2010] contribution by discussing how their analysis of sensemaking through explicit language can also illustrate the components of a broader explanatory process emerging within entrepreneurship research [that is, the socially situated approach (Smith & Semin, 2004)].	Offers that an approach based on socially situated cognition supplies a broad and fruitful organizing framework that can be used to integrate a diverse set of research streams in entrepreneurial cognition.
2012	Haynie, Shepherd, & Patzelt (2012: 255)	Our findings indicate that individuals inexperienced in the entrepreneurial process who engage metacognitive resources use feedback more effectively than others, suggesting that metacognitive ability represents an important mechanism related to the development of expert performance.	Finds that metacognitive ability is an important factor in the development of expertise.