

THE MICROFOUNDATIONS OF ENTREPRENEURIAL COGNITION RESEARCH: TOWARD AN INTEGRATIVE APPROACH

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INTRODUCTION

In this paper we adopt a microfoundations-type approach to understanding the present state of the field of entrepreneurial cognition research. The notion of microfoundations – which link micro concepts to macro concepts (Barney & Felin, 2013) – is increasingly being utilized to unbundle compound processes, and thereby to generate improved explanations in social science research. Helpfully, the use of microfoundations is increasing in prominence in both entrepreneurship and management research (Bryant, 2014; Gavetti, 2005; Helfat & Peteraf, Forthcoming). For example, research on microfoundations in entrepreneurship has focused on entrepreneurial choice (Minniti & Bygrave, 1999), on the role of memory in the individual entrepreneur’s ability to adapt (Bryant, 2014), and on the focal role of entrepreneurship in sustained competitive advantage (Teece, 2007). One criticism of some work on microfoundations is that researchers often tend to specifically equate microfoundations research with individuals-focused research, while ignoring interactions among those individuals, ignoring the context, and missing a meta-theory that takes into account these contextualized interactions (Barney & Felin, 2013). We contend that with recent developments in the field, that an examination of the microfoundations of entrepreneurial cognition research can be seen as overcoming this limitation.

While the central research question in entrepreneurial cognition research has historically been: “How do entrepreneurs think?” (Mitchell, et al., 2007, p. 3), more recent research has been developing explanations that are interactive and contextualized (Mitchell, Mitchell, & Randolph-Seng, 2014; Mitchell, Randolph-Seng, & Mitchell, 2011). Specifically, using the socially situated approach, this research focuses on the idea that the thinking that underlies entrepreneurship is not static, but is dynamic: situated within specific people acting within a variety of active environments with varying degrees of distribution of such thinking across minds and tools (Mitchell, et al., 2014). Thus researchers are not only asking how entrepreneurs think, but are also asking what this means for other individuals and organizations, and why this matters for value creation more generally. This socially situated approach to entrepreneurial cognition moves beyond an underspecified approach to the examination of microfoundations (Barney & Felin,

2013), to one that is better suited to the development of a richer theory of entrepreneurship (Mitchell, 2011). In doing so, we move away from social cognition research that suffers from a ‘static-explanation problem’ – the equivalent of a theoretical ‘scrap book’ – toward research that offers more dynamic explanations – the equivalent of a theoretical ‘motion picture’ (Smith & Conrey, 2009).

In this paper, we thus position entrepreneurial cognition research – the search for explanations for how entrepreneurs think – within a domain that embraces the transformation of social psychological explanations from static to dynamic accounts, and thus combines the social/contextual elements and cognitive elements of entrepreneurship to better understand its microfoundations, and to offer the outlines of an integrative approach to entrepreneurial cognition research. In doing so, we do not mean to argue that this is the only lens through which to examine the thinking and doing that comprises entrepreneurship. We do, however, suggest that by seeking to better understand the thinking entrepreneur within a social situation, and with respect to her/his cognitions and motivations (see Fiske & Taylor, 1984), we will better be enabled to fit some of the micro-pieces into solving an entrepreneurship puzzle that would otherwise remain at least partially unassembled. In order to provide the necessary background to our argument, we will first address the following questions about entrepreneurial cognition: When and how did such study begin; what does it entail and imply for other research, and why does this matter?

In late 1980s and early 1990s, only a handful of researchers were interested in and working on socio-cognitive approaches to entrepreneurship, most of whom were unaware of the similar work being pursued by others. As this work began to coalesce, the definition of entrepreneurial cognition as: “*the knowledge structures that people use to make assessments, judgments or decisions involving opportunity evaluation and venture creation and growth*” emerged (Mitchell, et al., 2002a, p. 97); and entrepreneurial cognition research itself began to take form as an important subfield of entrepreneurship research (cf. Ireland & Webb, 2007; Mitchell et al., 2002a; 2004; 2007).

As scholars have increasingly explored new explanatory possibilities, the number of topics addressed by entrepreneurial cognition research has grown and many new avenues of research have been opened (Mitchell, 2011). In particular, as we have noted above, entrepreneurial cognition researchers have adopted progressively more dynamic approaches to answer or to otherwise tackle a variety of aspects of understanding how entrepreneur’s think (cf. Mitchell et al., 2014; Mitchell et al., 2011). Nevertheless, the early cognitive approaches to entrepreneurial cognition research that highlighted the idea that static psychological processes underlie entrepreneurial behavior (cf. Shaver & Scott, 1991) were some of the first to be utilized in entrepreneurial cognition research. Specifically, some past entrepreneurial cognition research has focused on the role of biases and heuristics (e.g., Busenitz & Barney, 1997; Simon, Houghton, & Aquino, 2000), effectuation (e.g., Sarasvathy, 2001), entrepreneurial expertise (e.g., Mitchell, 1994; Mitchell, Smith, Seawright, & Morse, 2000; Sarasvathy, Simon & Lave, 1998), entrepreneurial intentions (Bird, 1988; 1992); perceptions (e.g., Gaglio & Katz, 2001), planned behavior (Krueger & Carsrud, 1993), and so on. While these approaches have broadened our understanding of entrepreneurial cognition, we believe that opportunities still remain for further developing the field by utilizing explanations that are less-static and more-dynamic. This belief echoes recent critical reviews of the field of entrepreneurial cognition research which suggest that entrepreneurial cognition be studied using dynamic and multi-level perspectives that can explain

additional variance in how entrepreneurs think and act (see: Grégoire, Corbett & McMullen, 2011; also: Grégoire, 2014).

Consistent with the call for more dynamic research approaches in both the study of entrepreneurial cognition and the study of microfoundations, a new integrative approach to entrepreneurial cognition research has emerged from the idea of socially situated cognition (Mitchell, Randolph-Seng, & Mitchell, 2011). Socially situated cognition research stems from the premise that cognition is: (1) adaptive action-oriented, (2) embodied, (3) situated within and among specific individuals and environments, and is (4) distributed across minds and tools (Smith & Semin, 2004). As a result of conducting entrepreneurial cognition research based on this premise, we argue that it is possible to better and more comprehensively explain the dynamic nature of entrepreneurial thinking.

In this paper, therefore, we selectively review and trace from its roots in psychology, the progress of the field of entrepreneurial cognition research over time; and we make a case for socially situated cognition as a new and useful framework under which the microfoundations of some of the emerging and more dynamic approaches to the study of entrepreneurs' thinking can be understood and organized. We also outline some productive directions for future entrepreneurial cognition research. To assist with this process, Figure 1 provides a summary timeline of the transformation from relatively static conceptualizations in psychology toward more dynamic ones. Doing so allows us to understand the foundations of entrepreneurial cognition research, which thereby enables us to look forward toward potential future trends.

{Insert Figure 1 about here }

Thus, as a basis for this analysis, this paper is divided into three sections. In the first section, we first review the precursor field of social cognition, and its historical development, to explore how progression in this broader field serves as a conceptual footing for the more-specialized, microfoundation-based examination of 'entrepreneurial' social cognition. In the second section, we also briefly review some of the relevant work in fields closely related to entrepreneurship and entrepreneurial thinking (e.g., entrepreneurship in economic theory); and we discuss the work of scholars who provided earlier conceptualizations of the role human thought plays in economic aspects of entrepreneurship. We then selectively review the major theoretical approaches in the field of entrepreneurial cognition research and trace the progress of the field over time. In the last section, we make a case for socially situated cognition as a new and useful framework under which the microfoundations of some of the emerging and more dynamic approaches to the study of entrepreneurs' thinking can be understood and organized. We also outline some possible productive directions for future entrepreneurial cognition research. We therefore believe that the review of these earlier roots which follows next enables the reader to more fully appreciate how the development of social cognition research intertwines with other fields to influence the current state of entrepreneurial cognition research.

HISTORICAL CONTEXT: THE SOCIAL COGNITIVE APPROACH

Historical context permits what is significant in the latent structure of a phenomenon to stand out: to thereby shed light on the present and future through the illumination of the foundations of the past (cf. Tuchman, 1978). Entrepreneurial cognition research, with its short past but long developmental history, is well positioned to benefit from an exploration of the history of social cognitive approaches. Because the history of social cognition can be viewed as moving from the study of relatively static processes (e.g., the use of heuristics) to more dynamic processes

(e.g., how motivation affects already complex mental processes), we argue that our review of this historical context helps explain the recent shift toward more explicitly dynamic approaches.

Furthermore, such an exploration will in turn illuminate how that the present state of entrepreneurial cognition research and the foundations of the past can enable future research possibilities. For the field of entrepreneurial cognition research to have a long and productive life, it must build on the historical roots from which it came (Bird, 2006). Accordingly, in this section we provide a historical overview of social cognition research as one key building block of the foundation upon which the field of entrepreneurial cognition research has been and will be built.

Research on Social Mental Processes: How It Started

In *New Essays on Human Understanding*, Leibniz, a 17th/18th century philosopher, asserted that human decisions, followed by behavior toward accomplishing those decisions, was largely the result of, “an infinity of perceptions” (1704/1981, p. 53). Although the association between mental processes and human decision making was not necessarily new (see Whyte, 1960), Leibniz’s writings are one of the first known instances where someone specifically suggested that mental processes influence the choices and behaviors that humans pursue in response to their social environments (see Merikle & Reingold, 1992).

This thesis – that human decision making is related to mental processes – was strengthened approximately 100 years later, as demonstrations of hypnosis (Braid, 1843) and the development of evolutionary theory (Darwin, 1872) provided at least indirect evidence that mental processes influence human social decision making and behavior. At around this same time, the first documented experimental laboratory to study mental processes in humans was established (see Wundt [1910] for a description of his work in the 1870s), which was quickly followed by other experimental demonstrations of mental processes influencing human behavior (e.g., Pierce & Jastrow, 1884; Sidis, 1898). Although this early experimental evidence helped to support fledgling cognitive theories like Helmholtz’s (1867/1968) perceptual theory of inference, a full acceptance of the role of cognition in human choice and behavior was lacking. Even James (1890/1950), for example, argued against the existence of unconscious mental structures (chapter VI, Volume I: *Principles of Psychology*). Nevertheless, with the publication of their book, *Studies in Hysteria*, Breuer and Freud (1893-1895/1955) helped to bolster the case that mental processes are important in influencing human social decision making and behavior. Further, approaching the study of mental processes from a different angle, a separate line of research found support for automatic mental processes forming as the result of skill development and habit (see Bryan & Harter, 1899; Jastrow, 1906; Solomons & Stein, 1896). Such works as these laid the foundation for the idea that human mental processes are constructed to produce meaning, as reflected in the notion of constructivism discussed next.

From Constructivism to Behaviorism

Despite behaviorism beginning to take root in the field of psychology at the time (Watson, 1913), this early work done on social mental processes in humans supported a constructivist view on mental processes in which human thinking itself is expected to construct the meaning-to-reality linkage. This view can best be seen in the work of the Gestalt psychologists. One of the first experimental studies done on a Gestalt effect known as the *Phi Effect*, for example, showed that when two adjacent lights are flashed in succession rapidly they appear to be one light (Wertheimer, 1912).

As a result of this work, Gestalt psychology helped to lay important groundwork for the concepts of mental organization seen in later work done in human cognition. Even as early as 1927, for example, Zeigarnik (1927) demonstrated how personal motivations influence what participants can remember; and Bartlett (1932) provided evidence showing that personal motivations and dispositions can determine perception. Also influenced strongly by the Gestalt approach were the works of early social psychological theorists and researchers (e.g., Lewin's [1936] field theory and Brunswik's [1943] lens model). Researchers showed, for example, that simply having other people in close proximity influenced both performance and judgments (Allport, 1924; Asch, Block, & Hertzman, 1938; Sherif, 1936).

Based on this Gestalt-inspired research, perceptions of self and others were suggested to be actively constructed through mental process (e.g., Mead, 1934/1967). Nevertheless, as mentioned above, behaviorism was becoming increasingly mainstream. Unlike the constructivist approach, behaviorism (Skinner, 1938) rejected the use of any mediating internal variables (e.g., perceptions, motivations, cognitions) between a stimulus and a response; and therefore, the constructivist view on mental processes fell out of favor for a time. But despite the predominance of behaviorism-based explanations, certain questions concerning complex/higher-order thinking remained unanswered.

Mental Process Research: A 'New Look'

Accordingly, by late in the 1940s, researchers were becoming skeptical of behaviorist explanations of higher order human thinking such as, for example, explanations for speech production (Chomsky, 1959; Hebb, 1949; Lashley, 1951). Such discontent with behaviorism also helped to spawn, in part, the "New Look" on perception movement. Thus during this period, studies of attention, expectation, emotion, and motivation suggested explanations of basic perceptual processes in terms of higher-order mental processes (cf. Bruner, 1957). McGinnes (1949), for example, measured galvanic skin responses while exposing participants to unidentified taboo words, finding elevated levels of galvanic skin responses among those exposed to the taboo words versus those not exposed. Such findings helped to return to the forefront certain pre-behaviorist era research and theory about the active construction processes that suggested the influence of top-down mental processes on lower level perception (e.g., Bartlett, 1932).

However, New Look-movement evidence was not without criticism. For example, the assertion by the New Look researchers that nonconscious motivations can influence perception was successfully discounted on both methodological and conceptual grounds in the late 1950s (e.g., Adams, 1957; Eriksen, 1958; Goldiamond, 1958). Nevertheless, the general constructivist tenets, which assert that top-down mental processes influence lower level perception, survived such criticisms; and research consistent with the approach continued to flourish (e.g., Heider, 1958; Taylor & Fiske, 1975; Taylor & Thompson, 1982). However, the search was now underway for better theory that could effectively resolve the conceptual and methodological weaknesses that accompanied New-Look theorizing.

Mental Process Research: Cognition

In helpful coincidence, this search for better theory was aided by researchers seeking to support the computer revolution of the time. Indeed, following World War II, cognitive science adopted an approach that was grounded in the developments of anthropology, artificial intelligence, linguistics, neuroscience, philosophy, and psychology (Gardner, 1985). This interdisciplinary approach formed the basis of the cognitive revolution. This work is exemplified

in Neisser's (1967) cognition-focused research. As a result of this new approach, studying the previously 'prohibited' mediators between stimulus and response (under behaviorism at least) became core to the cognitive explanations offered by the information processing approach. This information processing approach itself became mainstream by the early 1970s (Bruner, 1992). This new approach was important, because it provided researchers with conceptual models free from the comparatively convoluted conceptions that complicated research under the New Look perspective (e.g., Logan & Cowan, 1984; Regan, 1981).

In contrast to past conceptualizations of mental processes, the information processing approach viewed human cognition in a simpler and more-straightforward fashion: as arising through the necessity for routine processing of information (e.g., Marcel, 1983). Peculiarly, this more-straightforward view of human cognition had roots in behaviorist theory in the sense that cognitive researchers of the time were led to view human thoughts and actions as conceptually distinct (Costall, 2006). Despite this criticism (made as early as 1952 by Osgood); the value of the cognitive perspective led social psychologists to incorporate cognitive methodology into the study of how the social world is understood by individuals.

Mental Process Research: Social Cognition

In the 1970s and continuing throughout the 1980s, researchers began to identify the social-cognitive components of human thought. One of the prime examples of this research was that of Kahneman and Tversky (1972) who identified commonly used cognitive shortcuts. Their work gave rise to a view of human thinking in which mental shortcuts are seen as inevitable based on the inherent limits of human cognition (Simon, 1979). In this approach, the mind is seen to function as a cognitive miser, using its scarce resources very judiciously.

Another example of research that identified the social-cognitive components of human thought exists in research that sought to understand the interaction between the perceiver's cognitive representations and the social context in which they arise. In this research, the combination of cognition and context were thought to regulate perception (Bargh, Bond, Lombardi, & Tota, 1986). As an example of this, Bargh and Pietromonaco (1982) showed that subliminally presented trait words (e.g., hostility) influenced the attributions people made of others. Research such as this led to a large number of studies, which demonstrated that information (e.g., images, words) of which a person is currently unaware can impact that person in consistent and predictable ways. These findings in turn built the case for what became known later as implicit cognition or automatic cognition (for a review see Andersen, Moskowitz, Blair, & Nosek, 2007). The result of this research was an understanding that social environmental cues could have a direct effect on behavior, with mediation by internal factors being the exception to the rule (see Dijksterhuis & Bargh, 2001). Research on these topics also encouraged the use of priming methods and implicit measures in which researchers increasingly attempted to present and measure information without the involvement of conscious awareness (for overview of these methods see Randolph-Seng, Williams, & Hayek, 2014).

Similar to cognitive psychology research, this early social cognition research generally conceived mental processes as influencing people's construal of their world in noncomplex and nonmotivational ways. But unlike cognitive psychology research, there was more of a focus on the internal construal of a situation. This approach was similar to pre-behaviorists perspectives (Bargh & Ferguson, 2000). Nevertheless, like cognitive research generally, social-cognitive research began to find that mental processes were not always simple, and that motivational considerations

may be more significant in defining a person's social perceptions than extant theorizing allowed (e.g., Thompson, Roman, Moskowitz, Chaiken, & Bargh, 1994). This realization, beginning in the early 1990's, led researchers to focus less on simplistic internal construals and more on the moderating effects of motivation in understanding social cognitive mental processing.

This transition from strictly cognitive to more motivational concerns still allowed for predictive cognitive models (e.g., dual processing models), given that mental processes could include or lack motivational considerations (see Chaiken & Trope, 1999). In moving beyond purely cognitive models, motivation was beginning to be seen as more central, directly influencing the mental processing that occurred. For example, goals were not only shown to specify specific actions, but actually to influence commitment to the interpretation of the world by individuals (Gollwitzer & Moskowitz, 1996; Kruglanski et al., 2002).

Back to the 'New Look'

As research on motivation continued to develop, research on mental processing was then brought full circle, such that a new crop of researchers rediscovered much of the prior constructivist work (e.g., Bartlett, 1932; Bruner, 1957; Helmholtz, 1867/1968). Assertions that motivations can preconsciously impact perceptions, thoughts, and behaviors, which were some of the more controversial aspects of the earlier New Look approach, have now found support. Researchers have demonstrated, for example, that people's visual gaze will tune to goal-relevant stimuli, but avoid goal-irrelevant stimuli outside of conscious awareness (e.g., Chiao, Heck, Nakayama, & Ambady, 2006; Koivisto & Revonsuo, 2007). In another such example, Balcetis and Dunning (2006) found individual preferences to nonconsciously distort visual information to agree with some desired preference.

As research in this area has continued to develop, it has now become evident that human wants (even unconscious) influence what is mentally accessible; and that such influence can then lead to shifts in perceptions of relevant stimuli (Fishbach & Ferguson, 2007). In this way, motivations can preconsciously impact perception, thoughts, and behaviors, which is consistent with constructivist views of cognition. As a result of this and other such work, the socially situated cognition approach has developed to provide a more unified method to explaining human cognition.

The Socially Situated Cognition Approach and Beyond

In order to understand how the socially situated approach to cognition emerged from social cognition research, it is important to discuss embodied cognition. Embodied cognition places an understanding of cognitive processes within the context of the environment, social setting, and situations a person may physically be responding to at a particular point in time (Thompson & Fine, 1999). Research showing that one's physical movements in space can influence ongoing cognition, affect, and behavior is not new (e.g., Solarz, 1960); but until more recently, the implications in cognitive domains have been mostly ignored. This is important because (as the review of social cognition above suggests) three major and related problems remained in understanding social cognition: 1) how do personal wants and desires interact with environmental influences to produce conscious perceptions and thoughts; 2) what role does the non-conscious parts of the human mental machinery have in one's perception of reality; and 3) how can one be aware of how the environment interacts with current motivations to produce perceptions, thoughts, and behaviors.

In direct response to these pressing issues, much of the recent work in embodied cognition has focused on approach and avoidance behaviors, particularly within the domain of automatic evaluations (Wentura & Rothermund, 2003). Bodily feedback in turn has been found to influence feelings of positive or negative affect (Neumann, Förster, & Strack, 2003), positive and negative attitudes toward novel objects (Jefferis, Loersch, & Fazio, 2007), persuasion (Briñol & Petty, 2003), and metacognitive experiences (Sanna, Schwartz, & Small, 2002). Further, individuals have been shown to automatically approach stimuli related to active goals and automatically avoid stimuli related to temptations (Fishbach & Shah, 2006). Other research has shown that individuals are visually selective to motivational influences and interpretations outside of conscious awareness (e.g., maintaining control, feeling good, etc. [Balcetis & Dunning, 2006; Isaacowitz, 2006]). Approach and avoidance orientations have also been found to be directly related to self-regulatory focus (Förster, Higgins, & Idson, 1998; Friedman & Förster, 2001). Even psychological representation of participants' body in the world has been demonstrated to depend on their nonconscious cultural motivations (Leung & Cohen, 2007). Embodied cognition thus complemented recent developments in theory by addressing the pressing issues that remained unresolved outside of a socially situated cognition perspective (cf., Smith & Semin, 2004).

Building on this, the socially situated cognition perspective (Smith & Semin, 2004, 2007) attempts to assimilate the implications of the insights in the aforementioned social cognition research using an integrative approach. As noted previously, the socially situated cognition approach proposes that human cognition is not merely embodied, but is also: action-oriented, situated, and distributed (Semin & Smith, 2013). This appealing argument proceeds as follows: If cognition is in the individual's body, and if such cognition exists to support action, then from a socially situated cognition perspective, emotion and motivation must therefore regulate cognition. Similarly, where cognition is socially situated (i.e., specific to a context), then it also follows that interactions with (and within) such social situations must strongly impact moment-to-moment cognition. And if cognition is accepted as distributed across minds and tools, then we can also expect a wide variety of social objects to enable or to hinder cognition. Social objects, therefore, might be expected to at once constitute some of the content of one's thought, while yet concurrently shaping the process underlying those thoughts and consequent actions.

The integrative approach of socially situated cognition to social cognition is consistent with current developments in the study of human mental functioning in both neuroscience research and research on culture and cognition. The dual process models of social cognition, for example, are now being connected to their neural correlates (e.g., Lieberman, Gaunt, Gilbert, & Trope, 2002) and the cultural influences on individual social cognition are being discovered (e.g., Zou et al. 2009). Interestingly, researchers have even begun to combine these two research streams into the new area of cultural neuroscience (Ames & Fiske, 2010; Cacioppo & Zhou, 2010).

Our discussion of the history and development of research on mental processes enables us to offer in the next section an explanation concerning how the field of entrepreneurial cognition research – with its accompanying microfoundations – has emerged and has progressed in light of these developments. It also allows us to highlight how entrepreneurial cognition research has developed in relation to advances in other fields – most notably the field of economics. This in turn will set the stage for a clearer understanding of where opportunities for future advancement in the area of entrepreneurial cognition research may be found.

ENTREPRENEURIAL COGNITION RESEARCH

Building primarily on the field of social cognition and combining the insights it offers with insights from other fields (e.g., the insight of early economics research of the important role played by the entrepreneur), entrepreneurial cognition researchers have extended understanding of human socioeconomic thought, such that better explanations of variance have become possible (Sarasvathy, 2004). In direct parallel with our more general review of social cognition, we aim to highlight the increasingly dynamic and situated nature of entrepreneurial cognition research throughout its history (e.g., the shift from characteristics to cognitive approaches) in order to help explain the recent developments in the socially situated cognition approach to entrepreneurial cognition research. Doing so enables us to take into account the contextualized interactions that an examination of microfoundations would require (Barney & Felin, 2013). To better enable our review of the contributions of entrepreneurship as a scholarly field, we structure this section according to two major topics: (1) origins of the field of entrepreneurial cognition research and (2) the major theoretical perspectives in entrepreneurial cognition research.

Origins of the Field of Entrepreneurial Cognition Research

Much like our analysis of the historical context of social cognition research, an analysis of the historical context of entrepreneurial cognition research also has much to offer. Specifically, such an analysis can demonstrate what is significant about the latent structure of the cognitions of entrepreneurs. Through use of a chronological approach, in Table 1 we highlight key earlier work that has been instrumental in the development of the area of entrepreneurial cognition research.

{Insert Table 1 about here}

Interestingly, as may be seen in this table, the importance of human thought in entrepreneurial processes was first recognized in the mid-1700s and early 1800s in the work of early economists. As implied above, we also note that the influence of social psychologists has become increasingly more salient in the study of entrepreneurship generally, and in entrepreneurial cognition research specifically.

Economics approaches. The work of early economists influenced research on entrepreneurial cognition, but has done so indirectly (as demonstrated in Table 1). In the 18th century, Richard Cantillon (1755) first introduced the concept of the entrepreneur – a self-employed individual and a risk-bearer who does not earn wages from employment but rather profits from utilizing judgment under uncertainty. Although the idea of entrepreneurial individuals exercising judgment under uncertainty presages current entrepreneurial cognition research, Cantillon’s entrepreneur differs from current conceptualizations in that his entrepreneur is not necessarily innovative in creating new demand through new products, but is simply meeting existing/known demand. Adding conceptually to the notions advanced by Cantillon, Nicolas Baudeau (1767) suggested that the exercise of the judgment necessary to meet demand requires specialized knowledge. Baudeau’s entrepreneur existed as a decision maker who bears risks but also acts as an innovator who profits through a reduction of costs. In this way, Baudeau emphasized the entrepreneur’s desire to translate knowledge into action, which provides an early assertion of the thinking-to-doing link that is at the core of entrepreneurial cognition research (Mitchell, et al., 2002a, p. 97). The idea of risk-bearing entrepreneurs advanced by Cantillon and Baudeau has had a profound impact on the economists that followed; for example, Say (1810) conceptualized entrepreneurs as those individuals who think and act (through experimentation and

risk taking) such that profit results. For Say, the thinking element of the entrepreneur is made explicit.

In contrast, we note that the work of the foregoing cited French classical economists seems to us to be in contrast to the work of classical British economists, such as Adam Smith (1776), who saw entrepreneurs as capitalists motivated by self-interest, and whose work downplayed or even eliminated the role of entrepreneurs from the somewhat mechanical functions of the assumed tendency toward general equilibrium expected of the market system.

In the early and mid-1900s, as the contributions of social psychology to the study of mental processes had already started to directly or indirectly influence other disciplines, some economists studying entrepreneurship implicitly or explicitly incorporated more socio-cognitive elements in their work. For example, Knight (1921) focused on an entrepreneur who, as the bearer of uncertainty, thought and acted in the face of a future that is often unknowable.

Likewise, in this period, work on human imagination (Dewing, 1920), decision making (Danhof; 1949; Lamb, 1952), and alertness (Evans, 1957) started to emerge. For example, consistent with Knight (1921), Danhof (1949) argued that the central role of the entrepreneur is making decisions regarding what information is relevant. This early work also started to recognize the timing and historical context of entrepreneurial processes and how they influence entrepreneurial thinking and functions (McGuire, 1964), providing early intimations concerning the situated nature of entrepreneurial thinking and functions. Indeed, the breadth of prior research highlights the need to investigate all aspects influencing individuals and their entrepreneurial thinking, including social, economic, political, and psychological factors (Palmer, 1971).

A somewhat parallel wave of pertinent research came from work in Austrian economics, which in contrast to neoclassical economics, does not assume perfect information and rational agents. Rather, it assumes disequilibrium and asymmetric information as the steady state of an economy. The entrepreneur, acting on his own free will or motivation (cf. Menger, 1871), discovers and exploits these ‘gaps’ in the economic system, thereby moving markets closer to equilibrium and earning entrepreneurial rents. For example, von Mises (1949) characterized an entrepreneur as an “acting man in regard to the changes occurring in the data of the market” (p. 255). Under the Austrian view, entrepreneurs are treated as the driving force of the market and the engine of the economy. In particular, Kirzner (1973) incorporated von Mises’ (1949) idea of asymmetric information and von Hayek’s (1948) notion of imperfect knowledge in his theorizing. He described how subsets of the population (i.e., entrepreneurs) were more alert to opportunities; and by pursuing these opportunities could realize entrepreneurial profits. In a departure of sorts from a pure Austrian view of imperfect information, Kirzner casts equilibration as “a systematic process in which market participants acquire more and more accurate and complete *mutual knowledge* of potential demand and supply attitudes” and positions entrepreneurial discovery as the “driving force behind this systematic process” (Kirzner, 1997, p. 62, emphasis in original). Although an Austrian view of the entrepreneur is commensurate with more cognitive approaches to the entrepreneur, economics represents but one pathway to understanding entrepreneurs. In the history of the development of entrepreneurship as a field of research generally – and entrepreneurial cognition research specifically – the characteristics approach plays an important role, as we describe in the following section.

Characteristics approaches. Somewhat overlapping with economic approaches to the study of entrepreneurs, a distinctive stream of research has focused on the personality

characteristics/traits/demographics of the entrepreneur. Research that takes this approach to understanding the entrepreneur asserts that fairly immutable traits differentiate entrepreneurs from non-entrepreneurs. In particular, McClelland's *The Achieving Society* (1961) made an early and important imprint in the study of the entrepreneurial personality as part of the characteristics approach. Soon thereafter McClelland (1965) asserted that a need for achievement also drives people to become entrepreneurs. Berlew (1975) further asserted that entrepreneurs have a high internal locus of control than non-entrepreneurs and that they desire and perform best when being responsible for their own success.

Likewise, demographic characteristics have also been used to explain the difference between entrepreneurs and non-entrepreneurs (cf. Brockhaus & Horowitz, 1986). These demographic indicators include such variables as age, years married, years in the workforce, extent of previous employments, education, prior entrepreneurship, sibling order within a family or being a child of an owner-manager, trade credentials, monetary goals, encouragement from a support network, expectation of difficulties in a startup, and the assessment of personal shortcomings. As we explain in more detail in the following paragraphs, empirical findings from prior research investigating demographic characteristics of entrepreneurs are mixed.

Despite many attempts to differentiate between entrepreneurs and non-entrepreneurs using personality and demographic characteristics, empirical findings have shown that characteristics seem to be unreliable predictors of entrepreneurship (Sexton & Bowman-Upton, 1991). For example, in the case of personality factors, research shows that entrepreneurs do not have higher need for achievement than executives (Brockhaus & Horowitz, 1986), higher locus of control than managers (Brockhaus & Nord, 1979), or higher risk propensity or risk preference patterns than managers (Brockhaus, 1980). In the case of demographic variables, although Litvak and Maule (1971) found that successful high-technology entrepreneurs have fathers who are owner-managers; when Brockhaus and Nord (1979) surveyed managers and new entrepreneurs as to the business ownership of any close relative or friend, they found no significant difference between the two groups. It was the mixed nature of these findings that led to an increased focus on both psychology (e.g., Shaver & Scott, 1991) and behavior (e.g., Gartner, 1989) beginning in the late 1980s and early 1990s.

But despite equivocal findings regarding the role of characteristics in explaining entrepreneurship and a shift in focus to entrepreneurial cognition and entrepreneurial behavior, the debate regarding characteristics continues as newer and better analytical techniques have been brought to bear. For example, meta-analyses of the growing body of entrepreneurship research are beginning to provide some evidence for the predictive validity of certain individual characteristics (Collins, Hanges, & Locke, 2004; Stewart & Roth, 2001; Zhao & Seibert, 2006). Notably, in their recent meta-analysis Rauch and Frese (2007) conclude that matching characteristics/traits to the tasks of entrepreneurs produces better entrepreneurial outcomes, namely business creation and business success.

The mixed nature of the findings related to characteristics leaves us to wonder, for example, about the extent to which prior empirical approaches have been sufficiently fine-grained to rigorously explain the variance between groups (entrepreneurs and nonentrepreneurs) and within groups (among entrepreneurs). We see what is transpiring in entrepreneurship as somewhat akin to the swing of the pendulum between behaviorism and cognition in the field of psychology. If the debate between personality characteristics/traits/demographics versus other explanations in the field of entrepreneurship is also pendulum-like, then perhaps the same kinds of solutions to the

behaviorism versus cognition debate can apply in entrepreneurship. One solution is especially germane: the development of better theory. In the next section, we highlight entrepreneurial cognition research as one potential pathway to better theory. We do so with the intent of examining the extent to which additional theorizing can address the case of entrepreneurs, especially in terms of understanding the link between *how entrepreneurs think* and *what entrepreneurs do*.

Cognitive approaches. Moving forward (and growing out of dissatisfactions with and/or shortages of sufficiently-explanatory economics and characteristics-based approaches to the study of entrepreneurs' thought and behavior), research in entrepreneurship began to rely upon cognition to a greater extent. Concepts that were developed in cognitive psychology were found to be increasingly useful in understanding the individual entrepreneur. For example, entrepreneurship research began to utilize concepts such as specialized knowledge, decision making, perceptions, etc. (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). The implicit use of cognition in entrepreneurship research became more explicit with Bird's introduction of the concept of entrepreneurial intentions and the idea of entrepreneurs' cognition (Bird, 1988; 1992). Other researchers further made explicit the role of cognition in entrepreneurship through research on attribution theory, expertise, heuristics and biases (e.g., Boyd & Vozikis, 1994; Busenitz & Barney, 1997; Chandler & Jansen, 1992; Chen, Greene, & Crick, 1998; Gatewood, Shaver & Gartner, 1995; Katz, 1992; Krueger, 1993; Krueger & Brazeal, 1994; Krueger & Carsrud, 1993; Krueger & Dickson, 1994; Kolvereid, 1996; Mitchell, 1994; Mitchell & Chesteen, 1995), leading to even more possible approaches to the study of the individual entrepreneur.

We consider Bird's application of the concept of entrepreneurial intentions to entrepreneurial cognition research to be an important theoretical advancement in the field of entrepreneurship. Before Bird (1988), the focus of the larger field of entrepreneurship had been on behavior as the result of individual differences (i.e., personality characteristics/ traits) rather than the result of cognitive processes – namely leading from thinking/ intention to behavior. By specifying entrepreneurial intentions as a necessary condition of entrepreneurial behavior, entrepreneurship was beginning to be viewed as a unique form of information processing. By making cognition explicit in entrepreneurship, this work set the stage for research on entrepreneurial cognition in the ensuing decades, a time in which a more systematic approach to the study of entrepreneurial cognition was adopted.

Major Theoretical Perspectives in Entrepreneurial Cognition Research

As demonstrated in the preceding section, the study of mental processes began to play a more central role in the study of individual entrepreneurs. This shift was largely the result of perceptions that prior theory was inadequate to the task. For example, Shaver and Scott (1991) called for more comprehensive psychological approaches to be applied to the study of entrepreneurs. They suggested an approach to the study of entrepreneurs that focused on three major areas: (1) the individual entrepreneur, (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). The work of Shaver and Scott (1991) exemplifies a new, more systematic approach to entrepreneurial cognition research. In Table 2, we provide a representative and more detailed articulation of the entrepreneurial cognition research that followed.

We employed several systematic search techniques to locate papers include in Table 2. First, we use combinations of keywords related to entrepreneurial cognition (e.g., entrepreneur, founder, new venture, cognition, cognitive) in several databases: ProQuest's ABI/INFORM, EBSCOhost's Business Source Complete and PsycInfo, and Google Scholar. Second, we manually searched the major entrepreneurship and management journals to find additional papers referenced in located papers. Third, we cross-reference with papers included in Forbes (1999) and Grégoire et al. (2011). Nevertheless, the search is not meant to be an exhaustive review of entrepreneurial cognition research but a selective highlight of different perspectives.

In the sub-sections that follow, we then highlight what we see as the key theoretical perspectives that have begun to emerge in entrepreneurial cognition research. We divide this rich corpus of literature into several theoretical perspectives. Other systematic reviews of entrepreneurship cognition research, such as Forbes (1999), Mitchell et al. (2007), and Grégoire et al. (2011) are also available. Forbes (1999) scanned the extant literature on two dimensions – individuals' cognitive processes and new ventures' development processes, while Grégoire et al. (2011) adopted a cognitive perspective and examined articles on their cognitive elements, process, and levels of analysis. In contrast, Mitchell et al. (2007) did not take a strong perspective of their own but simply organized schools of thoughts under their common roots. Because one of our aims here has been to provide a historical tracing of ideas in the entrepreneurial cognition research, we adopt Mitchell et al.'s (2007) approach, which better fits our purpose; and we therefore focus on the theoretical perspectives that can be contrasted with the historical context in social cognitive research and recent development in entrepreneurial cognition research.

{Insert Table 2 about here }

Heuristics approaches. The term heuristics refers to the mental phenomena present when an individual makes judgment-based decisions using simplifying strategies. Thus, Tversky and Kahneman (1974, pp. 1124-1129) argue that when exercising judgment under uncertainty, individuals subjectively assess probabilities using mental shortcuts. Their argument suggests three shortcuts they term heuristics (representativeness, availability, adjustment and anchoring) that give rise to a set of biases corresponding to each (e.g., representativeness: insensitivity bias to sample size prior probabilities, or predictability; availability: biases due to retrievability, imaginability, or illusory correlation; adjustment/ anchoring: biases due to insufficient adjustment, evaluation, subjective probability distributions, etc.). But beyond probability judgments, arguments have also been made that heuristics and biases influence a wide variety of decisions, where decisions are based in solving experience-based problems, and decisions need to be quick rather than optimal (cf. McGrath, 1999; Simon, 1956).

Heuristics-based explanations of entrepreneurial cognition suggest, for example, that entrepreneurs make sense of uncertain and complex situations more quickly through: (1) greater use of decision shortcuts that can lead to decision errors, such as representativeness errors, the planning fallacy, and illusion of control (Busenitz & Barney, 1997), and (2) susceptibility to cognitive biases, such as sunk costs bias (Baron, 2004) or confirmation bias (McGrath, 1999). The field, however, is relatively open for further research, given that a wide variety of heuristics have been identified within the psychology literature.

Entrepreneurial cognition research using the heuristics approach has suggested that individuals' decision to start new ventures is in due part to biased mental processing of risk (Simon, Houghton, & Aquino, 2000), and that such biases vary depending on the environments

from which the decisions arise (Simon & Houghton, 2002). In his doctoral dissertation, Busenitz (1992) specifically focused on the role cognitive biases play in the decision-making process of entrepreneurs as compared to that of managers. Entrepreneurs have also been shown to have a future-orientation (Baron, 2000), to display overconfidence bias due both to personal and environmental factors (Forbes, 2005), and to rely more on heuristics when *evaluating* opportunities but not when *exploiting* opportunities (Bryant, 2007). In general, entrepreneurs are thought to rely on mental simulation and counterfactual thinking to guide their action (Gaglio, 2004) and to more frequently to employ heuristics (Alvarez & Busenitz, 2001). These heuristics can be seen a kind of microfoundation for entrepreneurial performance (Eisenhardt, Furr, & Bingham, 2010).

Expertise approaches. Expertise refers to the interdisciplinary construct that has been utilized in cognitive psychology to explain high performance in individuals in domains that require extensive knowledge *combined with practice* (Ericsson, 1996). Originating in the work of deGroot to explain chess mastery (1946), the application of the term expertise to explanations of proficiency was expanded by Chase and Simon (1973) to include high capability at “any skilled task (e.g., football, music)” (1973, p. 279). In particular, the differentiation between experts and novices based upon information processing differences in their expert ‘scripts’ garnered much attention in the literature in the period from the mid-1980s through the mid-1990s (Glaser, 1984; Leddo & Abelson, 1986; Lord & Maher, 1990). Having been applied successfully in explaining performance differences between experts and novices in chess and other skill domains (such as parole officers, physics teaching, and trauma physicians) it was a logical extension to apply expertise-based information processing theory to cognitive explanations for distinguishing entrepreneurs from other business persons.

In his dissertation, Mitchell (1994) found differences in the thinking of expert versus novice entrepreneurs and suggested that entrepreneurial thinking was a kind of expertise: the possession by entrepreneurs of scripts or knowledge structures that enable ‘expert’ entrepreneurs to use information significantly better than can ‘novice’ entrepreneurs. This research enabled the operationalization of the construct of entrepreneurial expertise, which at the time was beginning to be included as a useful component in venture creation and success (Bull & Willard, 1993; Cooper, 1993). Research using an expertise-based approach often emphasizes that individuals *can* acquire entrepreneurial expertise through deliberate practice (e.g., Baron & Henry, 2010; Mitchell, 2005; Mitchell & Chesteen, 1995) and through learning (e.g., Corbett, 2005, 2007). Building on a model proposed by Busenitz and Lau (1996), Mitchell et al. (2000) suggested and tested a sequential model in which the venture creation decision is associated with expert scripts (i.e., arrangements, willingness, and ability scripts), which in turn are argued to be shaped by cultural factors. Likewise, Mitchell, Friga and Mitchell (2005) suggest that entrepreneurial intuition represents a kind of proceduralized expertise. In this way, the influence of entrepreneurial thinking on entrepreneurial behaviors has been both theorized and empirically examined (Busenitz & Lau, 1996; Mitchell et al., 2000; Mitchell et al., 2002b). As an example of this in the opportunity recognition process, Baron and Ensley (2006) demonstrated how experienced entrepreneurs differ from novice entrepreneurs in how they perceive patterns among seemingly unrelated events. Their work invokes both knowledge structures – a notion that is central expertise research – and alertness to entrepreneurial opportunities. Given the importance of entrepreneurship as a microfoundation of dynamic capabilities and organizational performance (Teece, 2007; Eisenhardt, Furr, & Bingham, 2010) and the role of cognition in the development of such capabilities (Helfat & Peteraf, Forthcoming), we thus see this prior work on entrepreneurial expertise as only increasing in its usefulness to theory and practice.

Alertness approaches. As noted earlier, Kirzner (1973) introduced entrepreneurial alertness as an alternative to the normative model in neoclassical economics. Entrepreneurial alertness refers to “an attitude of receptiveness to available (but hitherto overlooked) opportunities” (Kirzner, 1997, p. 72). From the perspective of entrepreneurial cognition research, alertness represents a key difference between entrepreneurs and non-entrepreneurs. Gaglio and Katz (2001, p. 96) expanded the notion of entrepreneurial alertness to define it as: “a distinctive set of perceptual and cognitive processing skills” that drives the opportunity identification process. Although Kirzner’s notion of entrepreneurial alertness was criticized due to limited empirical evidence in support of the theory (Kaish & Gilad, 1991), Gaglio and Katz’s (2001) expansion of the concept with specification of behaviors along an alert/non-alert continuum, has reopened the pathway to future empirical research on alertness. For example, Tang, Kacmar, and Busenitz (2012) developed a 13-item scale to capture three distinct elements of alertness: scanning and search, association and connection, and evaluation and judgment.

In addition, Baron and Ensley (2006) expanded use of the alertness construct by bridging it with expertise-based work and empirically demonstrating how pattern recognition differentiates experienced entrepreneurs from novice entrepreneurs. Their findings are consistent with expert information processing theory (e.g., Glaser [1984]) in that they suggest that the opportunity prototypes of experience entrepreneurs are more complex and specific than those of novice entrepreneurs. Likewise, Grégoire, Barr, and Shepherd (2010) adopted an approach that combines perspectives. Specifically, they suggest that entrepreneurs perceive and identify opportunities by aligning the structural capabilities of supply (new technologies) with the structural causes of demand (particular markets). Grégoire and Shepherd (2012) have further argued that similarities between technologies and markets influence the beliefs that an opportunity exists. In particular, individuals with more entrepreneurial intention were able to identify opportunities using structural similarities beyond superficial similarities between technologies and markets (Grégoire & Shepherd, 2012). We highlight these research findings that build on an alertness approach because they demonstrate how alertness research represents an early approach to microfoundations and its overlap with other entrepreneurial cognition research that seeks to understand how entrepreneurs think.

Effectuation approaches. The effectuation approach to entrepreneurial cognition research (see e.g., Sarasvathy, 2001, 2008) represents a non-causal explanation for new venture creation that occurs in highly uncertain and dynamic environments. In this approach, entrepreneurs assess themselves rather than the opportunity, focus on resources under control (e.g., their own money that they can afford to lose) rather than resources they cannot control (e.g., investors’ money), engage in networking rather than competitive analysis, expect uncertainty rather than avoid it, and create new ventures through enactment of imagination, experimentation, and iterative learning rather than through reaction to the environments. This approach is not unrelated to the expertise approach in that expert entrepreneurs are seen as being more likely to use effectual logic than are novice entrepreneurs (Dew et al., 2009; Read et al., 2009a, 2009b).

The effectuation approach suggests that cognition and action proceed together to create one of several possible outcomes; however, the path to that outcome is often non-linear and the outcome is likely to change over time (Sarasvathy, 2001). Although some of the key research on effectuation is based on experiments (e.g., Dew et al., 2009; Read et al., 2009a), other research has also empirically tested effectuation beyond the use of experiments. For example, Chandler et al. (2011) developed a formative, multi-dimensional measure to capture sub-components of

effectuation that includes the following: experimentation, affordable loss, flexibility, and pre-commitments. Perry et al. (2012) also suggest ways to design and conduct empirically rigorous effectuation studies.

Action-centric approaches. McMullen and Shepherd (2006) suggested the importance of entrepreneurial action as it relates to how entrepreneurs think. Specifically, they discuss the decision-making process wherein entrepreneurs make choices about opportunities and alternative courses of action taking place in an uncertain environment. This action-centric decision-making process is thought to occur in two stages, when: (1) individuals escape ignorance to form a belief that an opportunity exists for someone (not necessarily themselves), and then (2) such individuals overcome doubt to form a belief that the opportunity is of value and is achievable by themselves. Building on the two-stage model of cognitive process to enable entrepreneurial action, Shepherd et al. (2007) detailed a bottom-up and a top-down cognitive mechanism of opportunity belief formation; and they also prescribed situation-contingent action strategies for each mechanism. Wood et al. (2012) further extended the two-stage model to a four-phase framework by integrating extant literature in opportunity identification and evaluation (e.g., Baron, 2006; Grégoire et al., 2010; Mitchell, 1994; Mitchell & Shepherd, 2010; Wood & McKelvie, in press; Wood & Williams, 2014) and by making a link to entrepreneurial intention. Wood et al. (2012) argue that intention is required to transition from cognitively judging an opportunity's viability to acting on those cognitions (Corbett & McMullen, 2007).

Studies of entrepreneurial intention have a long tradition of building on Ajzen's (1985, 1991) theory of planned behavior (Bird, 1988; Krueger et al., 2000; Shapero & Sokol, 1982) with a focus on perceived behavioral control – individual's perception of what can be done. More recently, the focus has shifted towards a focus on action. The thinking is that to exploit an opportunity, an entrepreneur must overcome doubt about the feasibility and desirability of action (e.g., Boyd & Vozikis, 1994; Dimov, 2007, 2010; Fitzsimmons & Douglas, 2011; Krueger, 1993; Krueger et al., 2000) to form opportunity beliefs that lead to action (McMullen & Shepherd, 2006; Shepherd et al., 2007). McMullen and Dimov (2013) further suggested that intent is crucial throughout the entrepreneurial process, but that individuals do not act entrepreneurially and embark on an entrepreneurial journey until the desired intention is combined with a product idea to form a goal intention. Given its focus on goals and action, research on entrepreneurial intention is complemented by extant work on entrepreneurial self-regulation.

Research on the effects of self-regulation (Carver & Scheier, 1981), regulatory focus (Higgins, 1987, 1998), and action regulation (Frese & Zapf, 1994) suggests that action is not only goal oriented but also feedback controlled at varying levels of abstraction. From a regulatory focus perspective, cognition assists entrepreneurs in monitoring, regulating, and enhancing their performance through chronic promotion- and prevention- focus (e.g., Brockner et al., 2004; Hmieleski & Baron, 2008) or momentary focus (e.g., McMullen & Shepherd, 2002). From an action regulation perspective, starting a new venture can be considered a successful action, which requires action planning in combination with goal intentions (Frese, 2007, 2009; Gielnik et al., in press). Likewise, Gielnik et al. (2014) found that although action planning moderates the effects of entrepreneurial goal intentions on new venture creation, the effects of action planning wears off over time. Taken together, the action-centered approach echoes one of the premises in socially situated cognition that cognition is adaptive action-oriented.

A separate subset of studies also relates to action and warrants attention. This research specifically links entrepreneurial action to more stable, dispositional cognitive styles (Goldstein &

Blackman, 1978; Ornstein, 1977). This research focuses on how entrepreneurs' cognitive styles may influence preferences for different types of learning, information processing, judgments, and decision making (e.g., Barbosa et al., 2007; Brigham et al., 2007; Dutta & Thornhill, 2008; Hmieleski & Corbett, 2006; cf. 'learning style', Corbett, 2007; 'action style', Frese et al., 1987).

Affect-centered approaches. Research has increasingly begun to focus on the topic of entrepreneurial affect in how the feelings and moods individuals experience in the present moment influence entrepreneurial cognition and consequently behavior. For example, Baron (2008) notes that affect can influence perceptions of the external world, creativity, heuristics, and memory. As a result, positive/negative affect is thought to potentially enhance/impede several aspects of the entrepreneurial process: opportunity recognition, financial and human resource acquisition, adaptation to dynamic environments, and stress tolerance (Baron, 2008). Research has since broadened to focus on both positive and negative affect and the consequences of each on entrepreneurial cognition and action (e.g., Foo, Uy, & Baron, 2009). As an example, fear of failure has been shown to influence perceptions of opportunity and to lead to avoidance of entrepreneurial action in some cases and engagement in entrepreneurial action in others (Mitchell & Shepherd, 2010; 2011). Work in the area of entrepreneurial affect has extensively attended to entrepreneurial passion and its influence in entrepreneurial thinking and action (e.g., Cardon et al., 2005, 2009; Shepherd & Cardon, 2009). For example, passion has been related to pattern recognition for opportunity discovery and exploitation in uncertain environments (Cardon & Stevens, 2009), to the entrepreneur's ability to raise funds (Cardon et al., 2009) and to hire and motivate employees (Cardon, 2008).

Dynamic approaches. Much of the early entrepreneurial cognition research adopted an approach to entrepreneurial thinking that was relatively static. This would seem to make sense in the development of a relatively new area of research. But as the sophistication of research questions and methods has increased, it is no surprise that research has increasingly focused on more dynamic aspects of entrepreneurial cognition. For example, action based meta-cognition (Haynie, Shepherd, Mosakowski, & Earley, 2010), network formation (De Carolis, Litzky, & Eddleston, 2009), and collective cognition (West, 2007) such as transactive memory systems (Zheng & Mai, 2013) have all been shown to influence entrepreneurial cognition and assist in forming a basis of a more socially situated view of entrepreneurial cognition (Mitchell et al., 2011).

Given the dynamic nature of entrepreneurship, research has thus moved beyond simple conceptualizations of cognition to conceptualizations that allow more for the interactive influence of situation (e.g., Krueger, 2000; Mitchell et al., 2000, 2002b), emotions (e.g., Cardon, 2008), actions (e.g., Shepherd et al., 2007), etc. As an example of this, Cornelissen and Clarke (2010, p. 547) suggest that the dynamics that result from embodiment play an important role in entrepreneurial cognition, where "human motor actions involving physical movement or physically holding or manipulating an object" influence how individual entrepreneurs speak about their new ventures. The inclusion of such dynamism would seem to be indicative of the need for a more comprehensive framework for thinking about entrepreneurial cognition that takes into account microfoundations. Based on the suggestion made by Mitchell et al. (2011), we develop more fully in the next section the idea that some of the more recent theories that have developed in social psychology, in particular the notion of socially situated cognition (Smith & Semin, 2004; Semin & Smith, 2013), can provide a useful framework for thinking about entrepreneurial cognition.

TOWARD MORE DYNAMIC APPROACHES TO ENTREPRENEURIAL COGNITION RESEARCH: SOCIALLY SITUATED COGNITION THEORY

In this paper we have suggested that researchers in the field of entrepreneurial cognition have used increasingly more-dynamic approaches to the study of entrepreneurs' thinking and mind. As previously highlighted, Mitchell et al. (2011, p. 774-775) recently proposed that these more dynamic approaches can be connected to four broad themes that constitute the socially situated cognition approach (Smith & Semin, 2004). In doing so, they noted that work in entrepreneurial cognition research had already acknowledged the influence of the social situation on the cognitions and thinking of entrepreneurs (e.g., Busenitz & Lau, 1996; Krueger, 2000; McGrath & MacMillan, 1992; Mitchell et al., 2000, 2002b, and others). The opportunity they highlighted, however, was a chance to view this existing research through a more dynamic lens by emphasizing socially situated cognition (Mitchell et al., 2011; Smith & Semin, 2004). In our discussion of socially situated cognition, we highlight the opportunities that derive from taking a more dynamic approach to the study of entrepreneurial cognition. Within the following paragraphs we therefore utilize some of the logic and literature reviewed in the previous sections to examine the contributions to date of the more dynamically based cognitive explanations in entrepreneurial cognition research, and look toward the future of entrepreneurial cognition research.

Additional Elaboration

As previously described, according to the socially situated cognition view of entrepreneurship (Mitchell et al., 2011; 2014), entrepreneurial cognition is: (1) adaptive action-oriented, (2) embodied, (3) situated, and (4) distributed. We now briefly elaborate on each of these themes.

The notion that entrepreneurial cognition is adaptive action-oriented is based on the idea that cognition is a mechanism to support social action and that "mental representations may be observed in a perceiver's positive or negative evaluation of, or motivation toward, an object or concept" (Mitchell et al., 2011, p. 774). The notion that entrepreneurial cognition is embodied proposes that bodily states and the physical brain influence cognition and thinking. Its basic argument is that whereas entrepreneurs' judgment, decision making, and moral approaches are generally viewed as being affected by states of mind, they can and should also be viewed as being affected by states of the body as well. The notion that entrepreneurial cognition is situated proposes that individuals' cognition is located within the interactive conversational situation (communicative context), relationships with others (relational context), and broader memberships in social groups (group context) (Smith & Semin, 2004). It is a perspective that defends viewing cognition in its social context. The idea that entrepreneurial cognition is distributed suggests that cognition is disseminated across social actors and tools in the environment, suggesting the idea that agency may be distributed in pursuing at least some entrepreneurial opportunities.

We propose that the socially situated cognition perspective may contribute to the field of entrepreneurial cognition research in at least three important ways. First, it can help the community of researchers to gain a new understanding of the past, present, and future of research on entrepreneurs thinking and decision making by organizing the literature in a new, meaningful way. Whereas previous categorizations of the field (e.g., Mitchell et al., 2007) have shown how the field can be understood in terms of different theoretical perspectives, this approach can help researchers see developments in important themes associated with human cognition and thinking.

Second, the socially situated cognition perspective can help facilitate and increase the legitimacy of new streams of research in entrepreneurship by showing how they fit in the larger picture. For example, new genetic-based research to the study of the entrepreneurs' thinking can be placed in the embodied branch. Similarly, other novel work can be placed in the related branches, thereby allowing the readers not familiar with the field to better understand such novel approaches in the light of the larger picture.

Third, and given the increased environmental dynamism many entrepreneurs are facing today (e.g., because of globalization, the speed of introducing new technologies, etc.), more dynamic approaches to the study of entrepreneurs are of high importance. The socially situated view attempts to invite researchers to use more-dynamic approaches to the study of entrepreneurs, which we believe can facilitate, within the field of entrepreneurial cognition research, the maintenance of its relevance to the real world at high levels. This may be achieved, for example, by explaining different phenomena that are taking place in the real world using adaptive action-oriented, embodied, situated, action-oriented, and/or distributed entrepreneurial cognition-related studies.

Benefits of Socially Situated Cognition Research: Early Evidence

We argue that, in terms of literature development, some of the more-recent entrepreneurial cognition research is implicitly based on elements of socially situated cognition without comprehensively assembling these elements into a coherent theory, which (we argue) socially situated entrepreneurial cognition research now does. Such research represents the foundation for future, more dynamic, explanations of entrepreneurs' thinking. Table 3 provides a selected list and summaries of such studies. Instead of intending to be comprehensive in our selection of these articles, our aim is mostly to illustrate, using a few good examples, how a focus on a socially situated cognition can be fruitful. As this table demonstrates, these studies implicitly (and sometimes explicitly) point to the high potential that exists in pursuing each of the four themes (action-oriented, embodied, situated, and distributed) of socially situated entrepreneurial cognition research. We review these exemplar studies below in more detail to show how they have contributed to our understanding of microfoundational processes in significant and novel ways.

{Insert Table 3 about Here }

In the case of the *adaptive action-oriented* theme of socially situated cognition, several studies have indicated elements of this theme as follows:

- Cornelissen and Clarke (2010, p. 552) highlight the idea that sensemaking is action-oriented in that it reflects a “process by which individuals construct meaning while speaking.” In this sense, the situated action of speaking to others shapes the cognition itself.
- Haynie, Shepherd, Mosakowski, and Earley's (2010, p. 218) work shows some elements of adaptive action-based metacognitive processing. They specifically suggest that metacognition plays a key role in cognitive adaptability, which involves an ability to act in a dynamic and flexible manner in the face of an uncertain and changing task environment.
- Mitchell and Shepherd (2010) also have shown some elements of adaptive action-oriented cognition in their study highlighting how entrepreneurs' images of their own capabilities and vulnerabilities combine with their situated images of opportunities to influence entrepreneurial action.

- Mitchell et al. (2012) investigated opportunity creation and did so by utilizing the basic structure of economic exchange to better explain the conditions under which an entrepreneur might be expected to act to create an opportunity. In a laboratory experiment, individuals were shown act to create opportunity significantly more often depending upon situated conditions of cognitive uncertainty.
- Wood, et al. (2012, p. 207) draw from human action and cognition research to suggest an “integrative model of the cognitive processes that foster entrepreneurial action.”

Thus, the realization that dynamic cognition-based explanations requires action to be incorporated in theorizing, has led entrepreneurship researchers to consider in new theory development, how cognitive properties change over time (Eliasmith, 2009). Thereby, the notion of including action in entrepreneurial cognition research infuses into social-situation-based theorizing the ontological notion that “...mind is much more a matter of what we do within environmental and social possibilities and bounds” (van Gelder, 1995, p. 380). A focus on action orientation thus permits and enables dynamism in explanations of such entrepreneurial functions as: meaning construction, adaptive metacognition, image reconciliation, opportunity creation, etc.

Turning to examples in the case of the *embodied* theme, research that is consistent with this theme has emerged, as follows:

- Nicolaou et al. (2008a) have shown that genetic factors can influence entrepreneurs’ thought and their tendency to engage in entrepreneurship. Using the same sample Nicolaou and colleagues (2008b) have also shown that genes can influence individuals’ sensation seeking and thereby, as they argue, their subsequent entrepreneurial behavior.
- Zhang et al. (2009) found that genetic factors influenced males and females differently when it came to the tendency of individuals to engage in entrepreneurship.
- Mitchell and Shepherd (2012) demonstrated in a field experiment how the process of physically codifying knowledge about entrepreneurial action can impact the extent to which this knowledge can be shared with others, thereby linking the body and the brain. This effect was above and beyond any effect of articulation alone.
- Baucus, Baucus, and Mitchell (2014) used concepts from neurophysiology and neuroscience to theorized concerning entrepreneurs’ brains and asserted that entrepreneurs’ brains are in many ways similar to other people’s brains, but when it comes to entrepreneurial knowledge and experiences, they are different.
- Kasperova and Kitching (2014) proposed that embodied conceptualization of the entrepreneurial identity is useful. These authors (2014, p. 448) write: “That these particular identities emerge from embodiment is self-evident, but the materiality of such embodiment and its effects on identity is usually left implicit.”
- Spivack, McKelvie, and Haynie (2014, p. 651) provided evidence that both entrepreneurial and moral judgment of “addicted” habitual entrepreneurs can be influenced by their very addicted body and brain, pointing to the darker sides of entrepreneurship.

Combined, these more-recent studies that implicate embodied cognition in theoretical development and explanation suggest that entrepreneurial thinking and behavior, including business and moral judgments, which have been generally viewed as the consequences of the state of the mind, might also be viewed as influenced by different states of the body.

In the case of the *situated* theme, approaches that are implicitly or explicitly based on the notion of situated entrepreneurial cognitions are also starting to contribute to our understanding in other interesting ways. For example:

- De Carolis, Litzky, and Eddleston (2009) suggested that network formation can influence individual cognition and found that the social network in which individuals are situated influences their entrepreneurial cognition and thinking. More specifically, these authors found that relational capital and social networks increase individuals' illusion of control and thereby the progress of new venture creation.
- Falck, Heblich, and Luedemann (2012), argued that individual's socialization result in entrepreneurial identity and intentions, suggesting the situated nature of entrepreneurial intentions.
- Haynie and his colleagues (2009; 2010) studied cognitive adaptability of individuals to their social situation, emphasizing the importance of metacognition as a concept that enables individuals to deal with feedback from a dynamic context. They found that individuals with higher metacognitive ability are more successful in adapting to the changes in their task (Haynie, Shepherd, & Patzelt, 2012).
- Valliere (2013, p. 433) extended the idea of entrepreneurial alertness to provide a foundation of what seems to be one of the first models of situated entrepreneurial alertness. Arguing that a type of situated attention is created by cognitive and structural factors, he proposes that such situated attention then "mediates between changes in the environment and the discovery or creation of opportunities to act."
- Wood, Bradley, and Artz (2014, in press) found that contrary to previous conceptualizations of entrepreneurs' optimism as being relatively universal, such optimism, as an important determinant of business growth, is in fact situated.
- Mitchell, Mitchell, Zachary, and Ryan (2014), used an agent-based simulation grounded in experimental data to establish how prior probabilities (i.e., Mitchell et al., 2012) in moment-to-moment interactions between internal cognition and outer situation can produce important outcomes such as exchange formation. These authors found that cognitions concerning the social situation explain more variance than do internal-environment-based cognitions.

Increasingly, then, the explanations that implicate the social situation are making additional contributions to the entrepreneurial cognition literature, where it is argued that "cognitive activity routinely exploits structure in the natural and social environment" (Robbins & Aydede, 2009, p. 3). Thus, networks, socialization, metacognitive adaptation, situated alertness, situated optimism, and outer-environment impacts, for example, connect person-in-situation with cognition and motivation (Fiske & Taylor, 1984) as a key contribution to entrepreneurial-cognition focused research.

In the case of the *distributed* theme, approaches that are consistent with this notion are also starting to contribute to our understanding in other interesting ways. For example:

- Royer (2003) suggested the notion of distributed cognition in the case of failed projects. She argues that "... a given sentiment can spread throughout an organization, reinforcing itself each step of the way [resulting in] ...a collective belief" (2003, p. 6).

- West (2007) highlighted the importance of viewing cognition in the context of a larger founding team. Specifically, he suggested that collective cognition (in terms of decision-making, perception, etc.) shapes action in a way that is unique from individual cognition, speaking to the distributed nature of cognition.
- Corbett, Neck and DeTienne (2007), argued that firms use “three types of termination scripts” (2007, p. 829) that exist across the organization; and that organizational learning depends upon on the choice of script.
- Zheng and Mai (2013) highlighted how cognition can be seen as distributed in their focus on transactive memory systems (TMSs) and how founding teams in emerging economies respond to surprises. Specifically, they demonstrate that “founding teams with strong TMSs are less inclined to acquire external knowledge but are more prone to improvise in response to surprises than founding teams with weak TMSs” (2013, p. 197).
- Corbett (2014) developed the concept of “entrepreneurial growth cognitions – the mental representations of how [groups of entrepreneurs]...can develop rapid-, big-growth-oriented firms right from the start” (Corbett, 2014, p. 398).

The “extension thesis” in social cognition research suggests that “the boundaries of cognition extend beyond the boundaries of individual organisms” (Robbins & Aydede, 2009, p. 3). This thesis, when applied to entrepreneurial cognition research indicates to us that the field is open to research in organizational and team cognition, since this is the social setting within which distributed cognition is very likely to appear. But we note that the opportunities to explain additional variance in a variety of phenomena remain essentially untapped.

In sum, the above studies point to the strong benefit that socially situated cognition based theorizing can offer in producing interesting and novel explanations for phenomena that fall within the purview of entrepreneurial cognition research. To visualize some aspects of the *future* potential of the socially situated cognition approach, in the next subsection we provide some possible avenues for future research.

Possible Directions for Future Research on Dynamic Entrepreneurial Cognition

A shift in theorizing from more-static to more-dynamic conceptualizations of entrepreneurial cognition (Mitchell, et al., 2011) opens up possibilities for future research. These new possibilities can be envisioned in new theoretical, meta-theoretical, and practical terms.

Theory. In analyzing the current literature, we have observed that there is an opportunity in entrepreneurship research to bridge linkages among the socially situated cognition themes (adaptive action-oriented, embodied, situated, distributed) that have heretofore been primarily implicit. That is, while we have observed the microfoundational elements of each theme in current literature to date (Table 3), they have not yet been comprehensively combined into a coherent theory of dynamic entrepreneurial cognition. In the following paragraphs, we invoke the themes of socially situated entrepreneurial cognition to illustrate the potential of a more coherent theory; and we do so in a way that enables even broader application and integration of theory.

Adaptive action-oriented and embodied. With respect to action and embodiment, for example, we note that in advancing the theory of multiple intelligences, Gardner (1983, 1993) suggests that intelligence extends beyond IQ alone. Whereas IQ had been conceptualized as general intelligence, Gardner sees intelligence as being more specific: existing, for example, as

linguistic intelligence, logical-mathematical intelligence, musical intelligence and even spatial intelligence. It has been further suggested (Tversky, 2009) that spatial cognition is part of socially situated cognitive theory, and specifically that: “the representations and processes used to understand the spatial world and act in it are those that allow invention, creativity, and discovery” (p. 213). Those interested in investigating the cognitive processes whereby entrepreneurs engage and productively participate in invention, creativity, and discovery may find ample theoretical foundations for such investigations in the notion of embodiment as it applies in spatially situated cognition. Tversky (2009) suggests that thought is shaped by space and action: space for the body, space around the body, and even space for navigation as one’s body engages in physical action. The idea of combining space and cognition, suggests a conceptual juxtaposition that may contribute substantively to explanations of both positive and negative elements of entrepreneurial cognition (see, e.g., Mitchell, Shepherd & Sharfman, 2011).

Situated. With respect to the influence of the social situation, we note Millikan’s (2009) assertion that “...one’s rationality depends at every point on the complex causal and informational structure of the empirical world; and that rationality is firmly embedded in the world outside the mind” (p. 181). Given recent findings that suggest the prominent role the ‘outer’ situation has on outcomes such as exchange formation (Mitchell, et al., 2014), we see opportunities to more-precisely define the boundaries of the inner- and outer-environment. We might inquire: What empirical data, sensory impressions (e.g., auditory, visual, etc.) can be, are directed to be, or are allowed (by the entrepreneur) to be within the perception-range of a given entrepreneur-individual? It is possible that an embedded rationality that is sense-based might productively be contrasted with virtual embeddedness (cf. Morse, Fowler, & Lawrence, 2007). Such research might give a great deal of additional meaning to conceptualizations of the socially situated and socially-constructed environments of entrepreneurs.

Distributed. With respect to distributed cognition, we note the additional opportunities for understanding “how simple and direct behavioral responses to sensory input can give way to abilities we more readily recognize as cognitive” (MacIver, 2009, p. 500). In referring to behavioral responses MacIver (2009) is asserting the notion that the effects of heritable mechanisms can account for previously unexplained variance in behavior. As early as 1992, Bridgeman wrote, “... consciousness is the operation of the plan-executing mechanism, enabling behavior to be driven by plans rather than immediate environmental contingencies” (p. 42). MacIver (2009) explains that theory based in neuroethology combines the laboratory science of neurobiology with observational sciences that seek understanding of the nervous system through analysis of the broader contexts of evolution, natural history, ecology, and everyday behavior, thereby becoming the study of situated nervous systems. In applying this to entrepreneurial cognition research, we suggest a possible area of research for understanding how expected responses of entrepreneurs to their environment may be at least partially explained by the distribution across minds of physiological regularities and the usefulness of the tools that entrepreneurs may utilize as a result (cf. MacIver, 2009).

Integration. When viewed together, the four themes in the dynamic conceptualization of entrepreneurial cognition research is useful in interpretive terms. To interpret the existing entrepreneurial cognition research literature in terms of the four themes of socially situated cognition research, we illustrate in Figure 2 how the four primary themes encompassed within the socially situated cognition framework (Smith & Semin, 2004) might serve as an ordering structure that can encompass and connect different approaches to entrepreneurial cognition research. As the

figure portrays, each approach has differential emphasis within one or more of the themes as they are mapped within this interpretive framework. Such mapping, we believe, can be helpful to our better understanding each approach to entrepreneurial cognition research vis-à-vis other approaches.

{Insert Figure 2 about here }

For example, heuristics-based approaches can be positioned in terms of the situated theme, as they attempt to explain how individuals in certain situations (e.g., a complex situation) may rely on decision shortcuts (cf. Busenitz & Barney, 1997). Alertness approaches can be viewed in terms of the situated theme. Specifically, when individuals find themselves in different situations/contexts, those with certain entrepreneurial knowledge structures are expected to perceive their context differently than those who lack the same knowledge structures, enabling some individuals to better identify entrepreneurial opportunities (cf. Valliere, 2013). Expertise approaches can be mapped at the intersection of distributed, situated, and action-oriented themes. That is, expertise can be viewed as both situated and action-oriented through its focus on deliberate practice (action-oriented) with experts (situated) (Baron & Henry, 2010; Mitchell, 2005). The effectuation approach can be seen as existing at the intersection between action-oriented and distributed themes, as it regularly emphasizes acting based on contingencies given the set of people and resources (minds and tools) at hand (Sarvasathy, 2001). Action-centric approaches (e.g., McMullen & Shepherd, 2006) can be placed in the intersection between situated and action-oriented themes, as taking action has been suggested to require at least two elements: the inner (goals as they influence thinking) and the outer (i.e., the situation) environment (Simon, 1990; Mitchell, Mitchell, Zachary & Ryan, 2014). Finally, affect-centric approaches appear to operate at the intersection of situated, embodied, and action-oriented themes, given the potential role of the situation and the body on the potential for entrepreneurial action (e.g., Baron, 2008).

In Figure 2, we also offer some observation-based expectations regarding future research trends. Using arrows, we illustrate our expectations for the expansion or contraction of research attention within each of the four socially situated cognition themes. Using circle size, we portray the approximate, relative amount of extant research. For example, we expect studies that focus on action-oriented cognition to be substantial. Our expectation is based on observations that an understanding of the dual relationship between action and cognition is essential (see e.g., Mitchell et al., 2011; Alvarez & Barney, 2007). We expect that the situated theme will receive substantial amount of research attention. This is because scholars from a variety of sub-fields of entrepreneurship are seeking for a better understanding of the contextual factors and their influence on entrepreneurial thinking and doing (e.g., Welter, 2011; Zahra, 2007; Zahra & Wright, 2011; Dew et al, in press). However, we also foresee contraction in oversimplified organizational and social contexts, such as using industry as a whole context or assuming entrepreneurship as an uncertain context. Likewise, we expect that a sizable amount of research to be conducted on distributed cognition. With increased recognition that many if not all ventures come to existence by entrepreneurial teams (West, 2007) and with resources from various supporters (Newbert, Tornikoski, & Quigley, 2013) and stakeholders (Venkataraman et al., 2012), research on distributed cognition can grow to include a wide variety of topics ranging from virtual teams that create new ventures to a diverse set of interrelated actors who create new industries (cf. Mol et al., in press). Lastly, we note how research on embodied cognition has attracted the least amount of research. Although advances in fields such as neuroscience offer great potential for conducting interesting and penetrating embodied-cognition research, practical issues make research in this

area difficult (e.g., the expense associated with utilization of present neuroscience technology, the time-consuming nature of capturing changes in bodily states using longitudinal and/or process research, etc.). But other areas of embodied cognition research offer more immediate opportunity. Specifically, there is an increasing focus on affect in the area of cognition (Baron, 2008; Cardon et al., 2005, 2009; Foo, Uy, & Baron, 2009; Shepherd & Cardon, 2009), which offers another promising way of understanding how an individual's current bodily state and physical brain can influence cognition and thinking.

The intent of Figure 2 is to integrate entrepreneurial cognition research as a way of demonstrating how cognition-based microfoundations of entrepreneurship research offer a platform for future theorizing. A recent special issue of the *International Journal of Management Reviews* is comprised of articles that take a similar (albeit less-explicit) approach to the attempt to capture key elements of entrepreneurial cognition research using an ordering-framework approach. For example, the SI Editors (Grégoire et al., in press) note that the framing of the field's future has shifted. It began by initially focusing on, for example, topics such as: entrepreneurial alertness, cognitive differences among entrepreneurs (vs. experts and novices), and connections between entrepreneurs' actions and their mental models (Forbes, 1999). It is now focusing more on: (1) encouraging research around three axes of conceptual development in entrepreneurial cognition research: origins and developments, a process orientation, cross-level studies (Grégoire et al., 2011); and (2) further conceiving of the development of entrepreneurial cognition research in terms of 'nouns' (studying the content of entrepreneurs' hearts and minds), 'adjectives' (qualifying the nature of entrepreneurs' distinctive abilities), and 'verbs' (studying the entrepreneurial mind in operation) (Grégoire et al., in press). We note these characterizations with interest.

We consider each of these characterizations to be consistent with, and helpful in chronicling the move from static to dynamic conceptualizations of the field of entrepreneurial cognition research. We also applaud the attention garnered by cognitive-view explanations in entrepreneurship research generally; and we encourage future conceptualizations of this multi-path stream of research. But in this latter respect we disagree with Grégoire et al. (in press) who argue that while "... the multiplicity of approaches to entrepreneurial cognition research affords a lot of breadth and richness, it also signals potential risks" (in press, p. 2). They note that these risks include a potential lack of research coherence to reduction in the extent of knowledge exchange leading to research that is confusing, difficult to understand or seemingly superficial or distant. While we see the point they are making, we believe that interpretive analysis such as that provided here (see Figure 2) can assist in providing the needed coherence without damage to the proliferation of creativity in building the knowledge base.

Meta Theory. Key for the continuing development of dynamic approaches to entrepreneurial cognition research is the simultaneous development of conceptualizations of entrepreneurship generally. For example, we see opportunities to link entrepreneurial cognition theory to theories about entrepreneurial opportunity, where entrepreneurs are seen as actors who 'create' opportunities (Alvarez & Barney, 2007; Mitchell, Morse, & Sharma, 2003). From a perspective of entrepreneurial cognition research, the cognitions of entrepreneurs as creators of opportunity are directed not at simply *perceiving possibilities* for business venture opportunity, but are rather directed at an iterative approach to *perceiving and acting to restructure* a current market environment to produce new opportunity. Put another way, the move from static to dynamic approaches to the study of entrepreneurial cognition must include an explication of how that

cognition is directed at *interactive* and *iterative* action which brings about opportunity qua novel market structures.

The socially situated cognition approach (Smith & Semin, 2004), provides a strong grounding for a meta-theoretical account of entrepreneurial cognition that begins with the foundational ideas that “thinking is for doing”; and for the idea that what we perceive as our environment is the way the outside world relates to us, as embodied agents situated in an environment. An entrepreneurs’ cognition, therefore, can best be interpreted according to their past experiences, not necessarily to perceive opportunity, but rather to one’s existing capabilities to change the market environment (Garud, Jain & Kumaraswamy, 2002; Mitchell, Morse & Sharma, 2003; Morse & Mitchell, 2005) to *create* novel structures for producing new market offerings (Felin & Zenger, 2009; Alvarez & Barney, 2007). Specifically, the metacognition involved in changing the market environment have been suggested as follows: that entrepreneurs change the market environment by utilizing the transaction cognitions of planning, promise, and competition, to organize (and reorganize) exchange relationships such that the impediments to the emergence of new value are reduced, and new exchanges – as the units of new value – are enabled (Morse & Mitchell, 2005, p. 363; see also Mitchell 2001, 2003, 2005).

This and other such situated-cognition-grounded perspectives are, we argue, the fundamental meta-theoretical grounding for framing a truly *dynamic* approach to understanding entrepreneurial cognition in the broader theoretical landscape. Other possible directions for future theoretical or meta-theoretical work could include the synthesis of this grounding with the ‘sensemaking’ processes articulated by Cornelissen and Clarke (2010). For example, it may be worth exploring how theorists can more precisely describe how cognitions which ‘make sense’ of the highly complex market environment are necessarily shaped by language processes that are directed at providing an agent with, simple, clear perceptions of how to successfully intervene and restructure that market environment in order to produce new offerings. Indeed, there are already some interesting steps in this direction (see e.g., Clarke & Cornelissen, 2014).

Application to research. We envision several broad approaches to applying the more dynamic theoretical framework of socially situated cognition to the study of thinking and behaviors of entrepreneurs. In the following paragraphs, we suggest ways in which researchers may apply the socially situated entrepreneurial cognition framework to new research in entrepreneurial cognition. Although not exhaustive, the ideas that follow are meant to be illustrative and generative in terms of creating possibilities for future research application.

Reexamining past research. We suggest that researchers might select a specific area or areas from past entrepreneurial cognition research and extend theoretical and empirical understanding by showing how findings of prior research can be seen from a situated, embodied, action-oriented and distributed view. One successful example of such approach might be seen in the work of Valliere (2013) who, by arguing that cognitive and structural factors create a situated attention for the individual entrepreneurs, has offered one of the first situated models of entrepreneurial alertness and made the notion of alertness more dynamic than previously conceptualized.

Adoption of socially situated cognition concepts. We also suggest that researchers adopt concepts and ideas from the socially situated cognition framework for broader application in entrepreneurship research. For example, the work of Nicolaou, et al. (2008a; 2008b), has implications for embodied cognition, but does not fully actualize the opportunity of linking

entrepreneurial thinking to embodiment. That is, their work does not invoke entrepreneurial cognition research generally (or socially situated cognition explanations specifically), but could do so with powerful results. A socially situated cognition perspective could be applied to introduce, for example, ideas such as gene-environment interaction into the entrepreneurial cognition research domain. By adopting a socially situated cognition perspective of embodiment, work such as this could move from static to dynamic understandings of the role of genetics in entrepreneurial cognition and action.

Comparison. We further suggest that researchers focus on comparisons between and among communicative contexts that entrepreneurs face in different situations. As Smith and Semin (2004) describe:

“This theme is also found in the classic research on ‘saying is believing’ initiated by Higgins and Rholes (1978). In these studies, speakers’ relationships were experimentally shaped to promote positive self-presentation or intimacy to a listener. Interdependence between communicator and recipient influenced not only the message people wrote, but also the communicator’s, own beliefs” (2004, p. 134).

We see such changes in beliefs to be important, as they may point to the possibility that the interdependence between the individual and his or her immediate communicative context may be the key to further explaining what leads to the formation of such important beliefs in entrepreneurship such as entrepreneurial identity, entrepreneurial intentions, or images about opportunities (Felin & Zenger, 2009; Mitchell & Shepherd, 2010). Moreover, focus on interdependence is important for other reasons, most notably because in the process of acquiring resources and organizing exchange relationships to pursue and exploit an entrepreneurial opportunities, entrepreneurs have to present their ideas to many different people, including resource providers, in positive ways to ensure success (cf. Cornelissen & Clarke, 2010). Interactions with such stakeholders and how they influence important cognitive and behavioral outcomes can shed new light on entrepreneurial thinking and action.

We therefore suggest that researchers should not only consider the influence of context on cognition, but make the interdependence between individual entrepreneurs and their social situation a central focus in their theorizing. For example, this approach may be helpful in the context of opportunity creation (e.g., Alvarez & Barney, 2007) for explaining situations where new industries are being created (in which no one has knowledge structures of the related artifacts, markets, etc.) or when individuals without much entrepreneurial cognition identify and exploit entrepreneurial opportunities. This moves closer to the suggestion that research not adopt the “language and metaphor of the ‘storage’ and ‘retrieval’ of representations,” but will rather “conceptualize representations as states that are constructed online in specific contexts” (Smith & Semin, 2004, p. 134). That is, when applied to opportunity creation, researchers are enabled to apply a socially situated cognition approach, which would highlight that opportunities can emerge in real time, situated in a specific context (as opposed to being created *ex ante* and as stored and retrieved information).

Antecedents, processes, and interdisciplinary perspectives. Finally, we also support the suggestion that research on entrepreneurial cognition can utilize the socially situated cognition framework to address some of the important antecedents, processes, and interdisciplinary perspectives (cf. Grégoire, Corbett & McMullen, 2011) not yet directly discussed in the socially situated literature to date. Within this line of inquiry, researchers may in the future, for example,

combine ideas and concepts from socially situated cognition with other concepts and ideas from other disciplines and provide novel insights in the study and theorizing about entrepreneurial thinking and behavior.

CONCLUSION

In this paper, we have reviewed the field of entrepreneurial cognition research from inception through its later development (as also summarized in Tables 1, 2, and 3). We have also suggested that socially situated cognition provides a robust, yet flexible theoretical framework for organizing future research conducted on entrepreneurial cognition. It combines the social/contextual and cognitive elements of entrepreneurship to better understand its microfoundations. Our hope has been to provide the reader with some of the most important developments and interesting research conducted in the field to date (in our view); to highlight a much broader spectrum of possibilities and avenues that can be explored within the entrepreneurial cognition research stream in the future; and, to help to better enable answers to one of the central questions in entrepreneurial cognition research: how do entrepreneurs think?

In doing so, however, we do not present the social situated approach as a trend, *per se*; but rather we present it to support our recommendation that it be more widely utilized as a key way of understanding the microfoundations of entrepreneurial cognition research. We do argue that with the increased dynamism and the rapid changes occurring continuously in the real world, this framework can help the field of entrepreneurial cognition research to maintain both theoretical and empirical relevance to its phenomena of study. In turn, we hope that movement toward dynamic explanations in entrepreneurial cognition research can help more entrepreneurs to contribute additional value to their own lives as well as to the well-being of the society in which they operate.

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

Year	Reference	Table 1: Excerpt or Summary	Literature Development Narrative
1755	Cantillon (1755/1931; as cited in Hébert & Link, 1989: 42)	... someone who engages in exchanges for profit; specifically, he exercises business judgments in the face of uncertainty.	In one of the earliest assertions that distinguishes the entrepreneur from others, an entrepreneur is suggested to be 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.	The requirements of such an exercise of judgment are asserted to be both desire and specialized knowledge, indirectly implicating the mind.
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 idea is suggested that both the knowledge and skill of the entrepreneur must be applied, especially through the action-oriented process of experimentation – suggesting, again indirectly, the link between thinking and doing.
1920	Dewing (1920: x, 4)	... individual initiative, personal ambition, and even the primitive passion of conquest, are forces which are necessary to produce the greatest efficiency of economic production ... All business enterprises owe their existence, in the beginning, to the imagination of some one man.	Other mental qualities such as imagination, passion, and taking initiative are also argued to be important to those who initiate or oversee production.

¹ Note: An earlier version of this table was used by permission in Mitchell, J. R., Mitchell, R. K. & Randolph-Seng, B. (Eds.) 2014. *Handbook of Entrepreneurial Cognition*: Edward Elgar.

² Prior to the adoption of the French term entrepreneur in English, the word was sometimes translated as “undertaker,” and at other times as “adventurer.” The word entrepreneur is used here.

Year	Reference	Table 1: Excerpt or Summary	Literature Development Narrative
1921	Knight (1921: 259, 273, 299)	The fundamental uncertainties of economic life are the errors in predicting the future and in making present adjustments to fit future conditions. . . The essential fact . . . is that men are acting, competing, on the basis of what they think of the future . . . the entrepreneur takes over all the uncertainty of the business along with control over it.	The role of the entrepreneur is more precisely defined: to think and act in the face of uncertainty by being the bearer of that uncertainty.
1949	Danhof (1949: 21)	Entrepreneurship is an activity or function and not a specific individual or occupation.	Three functions for the entrepreneur are suggested. The central role of the entrepreneur is making decisions regarding what types of information is relevant, foreshadowing the information processing research stream.
1952	Lamb (1952: 91)	...entrepreneurship is ... [a] form of social decision making performed by economic innovators.	Such decision making is suggested to be social in nature. Here, a social component is added to a thinking component as definitions are refined.
1957	Evans (1957: 50; cited in Palmer, 1971: 33)	<p>... 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 to achieve the previous goals set by the entrepreneur, become essentially management's. ...</p> <p>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.</p>	The idea that decision making is directed through continual alertness to changing market conditions and opportunities that arise from those changes is advanced. Alertness is linked to mental processes such as cognition; and the stage is set for development of conceptualizations of entrepreneurs in cognitive terms. (Note: We expect that such terms will be evident to the reader as the narrative proceeds, and thus not further noted.)
1964	McGuire (1964: 238)	Over time, and in different societies, there has evidently been a substantial change in entrepreneurial types, and presumably in the entrepreneur function.	The notion is introduced that history and culture are also important factors shaping entrepreneurship.
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.	A more holistic approach to the study of the entrepreneur is called for.

Year	Reference	Table 1: Excerpt or Summary	Literature Development Narrative
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.	The idea of alertness is further formalized 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 is advanced that education and experience can improve the efficiency of perceiving and interpreting information.
	Timmons (1975: 34)	Although an emotional attachment to one's brainchild may be essential to generate enthusiasm and commitment, it can also cloud the realities of what it takes to build a substantial business.	By conceptualizing emotional attachment as potentially detrimental in entrepreneurial thinking, foreshadows the role of cognitive biases in entrepreneurial cognition research.
1976	Comegys (1976: 1, 6)	... an entrepreneur's emotional attachment to his brainchild can distort his business behavior. Particular attention will be given to the adaption by entrepreneurs of defense mechanisms of the type commonly associated with cognitive dissonance theory. ... Being psychologically committed beyond the point of no return, the individual seeking dissonance reduction tends to become a complete optimist, and to see absolutely no room for doubt.	Uses cognitive dissonance theory to explain emotional attachment, which is asserted to lead to high optimism and ignoring negative evidence. These assertions become the forerunners of the heuristics and biases and affect-focused streams of entrepreneurial cognition research.
1987	Johnson & Kuehn (1987: 60)	Small businesses are regular consumers of external information, just as large businesses are, but the small business search differs from that in large organizations. Small business owner/managers are more concerned with external information than their counterparts in large organizations. Indeed, small business operations seem to require a broad, continuing search of the external environment. The inability of small business owner/ managers to specialize – unlike managers of larger organizations – may necessitate devoting more time and energy to the environmental search.	Suggests that business size is associated with the necessity for the continuing search by individuals for external and broad information; and thereby focuses research attention on information processing.
	Specht (1987: 21)	Sources used by strategic planning groups in small firms to collect information on the environment were studied. The relationship between perceived environmental change and complexity and use of personal and impersonal information sources was found not to be direct, but moderated by uncertainty	Provides further evidence that smaller firms are more concerned with external than internal information; and suggests that such information acquisition is

Year	Reference	Table 1: Excerpt or Summary	Literature Development Narrative
		about planning and intolerance of the ambiguous situation. In addition, personal sources were found to be used more than impersonal.	differentially acquired: i.e., through personal (vs. impersonal) sources.
1988	Smeltzer, Fann, & Nikolaisen (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.	Further focuses on information, suggesting that not all types of information are found to be equally valuable for alert entrepreneurs: informal, personal information appearing to be most valuable.
	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.	Further develops thinking-error research. Evidence is presented against formal/rational decision making views: entrepreneurs are suggested not to be comprehensive in their decision making.
	Cooper, Woo, & Dunkelberg (1988: 97)	Although previous evidence on business survival led to the hypothesis that the entrepreneurs would only be cautiously optimistic, this was not the case. They 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 ... poorly prepared were just as optimistic as those who were well prepared.	Additional qualities of entrepreneurial cognition are studied, leading away from trait-based and toward cognitively-based explanations. Entrepreneurs are shown to be generally optimistic, i.e., they perceive low levels of risk.
	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.	The role of perception is introduced into the entrepreneurship literature. Perceiving low levels of risk is suggested to 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 inception. Subsequent outcomes such as survival, development (including written plans), growth, and change are based on these intentions.	The concept of entrepreneurial intentions is introduced as a necessary condition for any entrepreneurial behavior.

Year	Reference	Table 1: Excerpt or Summary	Literature Development Narrative
1989	Hébert & Link (1989: 47)	The entrepreneur is someone who specializes in taking responsibility for and making judgmental 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 is advanced.
1989	Eisenhardt (1989: 543)	Fast decision makers use more, not less, information than do slow decision makers. The former also develop more, not fewer, alternatives, and use a two-tiered advice process. ... Finally, fast decisions based on this pattern of behaviors lead to superior performance.	The information processing stream is further developed: ... processing more information can actually lead to faster decision making in some ventures.
1990	Schafer (1990: 19)	Results suggest that very small businesses differentiate their scanning behaviors according to their level of entrepreneurship. Specifically, the “high” entrepreneurial group used human sources to gain information to a significantly greater degree than did either the “low” or “middle” groups.	The role of personalized knowledge is suggested to be important in entrepreneurial cognition.
	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.	The idea of non-comprehensive decision making is extended into the venture capital context. Low cognitive complexity, rather than specialization, is shown to impact VC decisions.

Table 2: Current Work on Entrepreneurial Cognition (1990 - Present)³

Year	Reference	Table 2: Excerpt or Summary	Literature Development 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>A comprehensive psychological approach to the study of new venture creation is called for. Such an approach, it is argued, should 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 further pursued by showing that such processes can be influenced by changing entrepreneurs' attitudes, as attitudes are susceptible to external impacts.</p>

³ Note: An earlier version of this table was used by permission in Mitchell, J. R., Mitchell, R. K. & Randolph-Seng, B. (Eds.) 2014. *Handbook of Entrepreneurial Cognition*: Edward Elgar.

Year	Reference	Table 2: Excerpt or Summary	Literature Development Narrative
Kaish & Gilad (1991: 59)	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)	Empirical evidence demonstrates that entrepreneurs process more information in their decision making.	
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.	The thought process of entrepreneurs is termed "entrepreneurs' cognition." The concept is defined in relation to its 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.	Research on non-rational choice/decision making is expanded and the concept of "entrepreneurial heuristics" is introduced into the literature. This research 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.	Further evidence for the use of heuristics, such as the representativeness heuristics, is found 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.	Heuristic-based decision processes are combined with social and psychological factors to propose a psychosocial cognitive model (PCM) of employment status choice.

Year	Reference	Table 2: Excerpt or Summary	Literature Development Narrative
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.	The suggestion is made 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.	It is shown that successful entrepreneurs think they have high levels of competencies in creation of novel ventures.	
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.	
Brush (1992: 50)	<p>This research shows new ventures to be actively engaged in scanning for marketplace information in their immediate environment using a variety of personal and impersonal sources. Personal sources, such as customers, competitors, and business contacts are generally preferred over impersonal sources such as magazines and journals; yet trade magazines were rated the most frequently utilized source overall. The most important type of marketplace information routinely collected was that relating to customers and competitors. Consistent with the preference for personal sources, informal data collection methods, telephone and person-to-person networking, were the most frequently utilized.</p> <p>The marketplace scanning activities of new ventures appear to be purposeful and directed rather than ad hoc. Respondents indicated routine collection of information relevant to the immediate marketplace environment through a variety of sources and methods. New venture owner/managers repeatedly noted that customer needs, competitors' products, and market growth were the most important things to scrutinize.</p>	Found that while new information is gained through market scanning and use of informal sources, such scanning is more purposeful than ad hoc.	

Year	Reference	Table 2: Excerpt or Summary	Literature Development Narrative
	Gartner, Bird, & Starr (1992: 17)	Emerging organizations are thoroughly equivocal realities (Weick, 1979) that tend towards non-equivocality through entrepreneurial action. In emerging organizations, entrepreneurs offer plausible explanations of current and future equivocal events as non-equivocal interpretations. Entrepreneurs talk and act "as if" equivocal events were non-equivocal. Emerging organizations are elaborate fictions of proposed possible future states of existence. In the context of the emerging organization, action is taken in expectation of a non-equivocal event occurring in the future.	Suggests that action is possible in equivocal situations because entrepreneurs engage in "as if" thinking and scenarios.
1993	Bull & Willard (1993: 183)	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: "A person will carry out a new combination, causing discontinuity, under conditions of: 1. Task-related motivation, 2. Expertise, 3. Expectation of personal gain, and 4. A supportive environment."	Expertise is proposed as one of the necessary elements for to explain why some founders succeed and others fail.
	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.	It is suggested that 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.	Intention-based approaches are further expanded by arguing that intentions channel beliefs and perceptions into the intent to act and, thereby, to the actions.

Year	Reference	Table 2: Excerpt or Summary	Literature Development 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.	Empirical support is found for the proposition that intentions 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.	The concept of self-efficacy is introduced and is suggested to play a role 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.	Increased self-efficacy is found to increase perceptions of opportunity and risk taking behavior, e.g., intention 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, an overarching model of entrepreneurial potential is offered.
	Hartman, Tower, & Sehora (1994: 45)	While the findings clearly support the notion that employees at all levels of the organization in small businesses do engage in varied search activity for new ideas and view themselves as active participants in the innovative process, it is equally clear from the study's findings that there exist considerable opportunities for improvement in the amount of employee involvement in the various steps of the innovation process. Given the severe competitive environment facing small businesses, these opportunities must be addressed through concerted action by small business owners/managers.	In one of the earlier investigations of group cognition, finds that search for new ideas may require more participation from employees than previously assumed.

Year	Reference	Table 2: Excerpt or Summary	Literature Development Narrative
	Mitchell (1994: 163)	[This research]... (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.	The notion of expertise in new ventures is formalized by introducing the term “entrepreneurial expertise.” A cognitive model that charts the composition, classification (experts vs. novices) and creation of new venture formation expertise is proposed and supported.
	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.	It is shown empirically that experience measures are inadequate surrogates for expertise.
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.	Novice and experienced entrepreneurs are shown to 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)	Entrepreneurial expertise is shown to be better-enhanced by experiential entrepreneurial instruction pedagogy than by a using a traditional business plan expertise-enhancement approach.

Year	Reference	Table 2: Excerpt or Summary	Literature Development Narrative
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.	Self-efficacy is shown to be 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).	Entrepreneurs generally are found to perceive more strengths and opportunities than weaknesses and threats, when working on business scenarios.	
Hill & Levenhagen (1995: 1057)	To cope with ... uncertainties, the entrepreneur must develop a "vision" or mental model of how the environment works (sensemaking) and then be able to communicate to others and gain their support (sensegiving). This paper discusses the process of mental model development for entrepreneurs. Metaphor development is proposed to be a significant and important stage in this process. Metaphors provide a common language and a basis for communication within the organization. Through metaphor(s) an organization develops a common language, an understanding of the task environment and a means of interpreting events. Metaphors are particularly useful in communicating broad and sometimes abstract concepts such as organizational mission and strategy and in situations requiring novel concepts and approaches.	Applies the notion of metaphors in entrepreneurship and suggests that to understand their environment and explain it to important others, entrepreneurs use metaphors as useful tools, which also helped them in their mental model development.	
Mohan-Neill (1995: 10)	The critical issue addressed in this article is whether there are differences in the environmental scanning activities of new and smaller ventures compared to older and larger firms. ... Overall, it appears that new or smaller ventures are less likely to engage in formal or structured marketing research activities and are less informed about macro-environmental conditions than older or larger firms. A firm's age also appears to be a more significant variable in determining environmental scanning behavior than a firm's size.	Further evidence is presented for the idea that new business owners use informal methods for gaining new information.	

Year	Reference	Table 2: Excerpt or Summary	Literature Development 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.	A cross-cultural model of the venture creation decision with cognitive roots is proposed. An individual's cognition is suggested to significantly affect 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.	A taxonomy is developed based upon the different reasons individuals provide for career choice intentions.
	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.	Empirical evidence that challenges the theory of alertness suggests that entrepreneurs are not more alert than non-entrepreneurs.
	Vincent (1996: 1)	Results indicate that Mexican-American small business entrepreneurs are twice as likely not to attend to traditionally formulated decision-making criteria than their Anglo-American counterparts. More Mexican-American entrepreneurs who lacked formulated decision-making policies had sole proprietorship businesses and less involvement of family members in their businesses than Mexican-American entrepreneurs with established policies.	Found that ethnic background of individuals lead to different decision-making criteria.
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.	Interview research suggests that it is cognitive-script development that separates entrepreneurs from novices.

Year	Reference	Table 2: Excerpt or Summary	Literature Development Narrative
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.	Entrepreneurial heuristics theory suggests that entrepreneurs are more susceptible to the use of heuristics due to uncertainty and complexity in their environment.	
Lang, Calantone, & Gudmundson (1997: 11)	... this study of a broad sample of small firms found positive relationships between perceived threats and information seeking and between perceived opportunities and information seeking. Moreover, there was a negative relationship between perceived threats and perceived opportunities, which raised the possibility of selective perception among small firm managers.	Provides additional evidence, echoing earlier assertions, that small firm managers are selective in their perception of information.	
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.	The susceptibility of entrepreneurs to cognitive biases is suggested to occur because of the demand of the entrepreneurial situation, i.e., because their environment overloads their information-processing capacity.

Year	Reference	Table 2: Excerpt or Summary	Literature Development Narrative
	Sarasvathy, Simon, & Lave (1998: 207)	We compared entrepreneurs with bankers in their perception and management of a variety of risks. Problems included financial risk, risk to human life and health, and risk of a natural disaster. Cluster analysis and content analysis of think-aloud protocols revealed surprising details. Entrepreneurs accept risk as given and focus on controlling the outcomes at any given level of risk; they also frame their problem spaces with personal values and assume greater personal responsibility for the outcomes. Bankers focus on target outcomes – attempting to control risk within structured problem spaces and avoiding situations where they risk higher levels of personal responsibility.	A cognitive (expertise-based) explanation for risk propensity of individual entrepreneurs is found contradicting previous trait-based explanations.
	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.	Entrepreneurial self-efficacy is found to explain successful performance of the various roles and tasks of entrepreneurship.
	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.	High self-efficacy in decision making is shown to increase 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.	A higher level of reliance on heuristics is shown to explain the risk-taking behavior of entrepreneurs.
	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.	Learning from failure is suggested to be important in the development of the interpretation processes of individuals; as such development is enabled or constrained by the degree to which a variety of thinking errors influence entrepreneurs’ thinking about their “real options” – their opportunities to continue to invest.

Year	Reference	Table 2: Excerpt or Summary	Literature Development Narrative
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.	Cross-cultural cognitions are found to explain significant variance in the venture creation decision.
	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....	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 is found.
	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. 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).	Individual cognitive orientation is combined with agency theory to explain different strategic buyout attributes.
	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.	Entrepreneurs are found often to take a strong future-oriented perspective, which may decrease their propensity to reflect on past events.

Year	Reference	Table 2: Excerpt or Summary	Literature Development Narrative
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 a valuable, rare resource for venture creation.
	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.	The concept of entrepreneurial alertness as the cognitive engine that drives the process of opportunity identification is suggested.
	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.	The concept and logic of effectuation are introduced; and expert entrepreneurs are suggested 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 scholars to refine conceptualizations and to enable additional coherence in entrepreneurial cognition research.

Year	Reference	Table 2: Excerpt or Summary	Literature Development Narrative
Mitchell, Smith, Morse, Seawright, Peredo, & McKenzie (2002: 9)	<p>We find...that individuals who possess “professional entrepreneurial cognitions” do indeed have cognitions that are distinct from business non-entrepreneurs...</p> <p>... we report further confirmation of a universal culture of entrepreneurship...</p> <p>... 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.</p>	<p>A cognitive explanation for the venture creation decision is suggested to be universal and cross-cultural. Both between groups (expert entrepreneurs and novices), and within-groups differences (among entrepreneurs of differential cultural background) are found.</p>	
Fiet (2002: 221)	<p>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.</p>	<p>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 is suggested.</p>	
Simon & Houghton (2002: 105)	<p>... 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.</p>	<p>Entrepreneurs’ decision environments are suggested to vary greatly and that such variation influences the types of biases that arise.</p>	
2003 Markman & Baron (2003: 281)	<p>... 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.</p>	<p>Higher levels of self-efficacy, perseverance, and social skills in individuals are suggested to more likely have fit with entrepreneurship phenomena.</p>	
Mitchell (2003: 195)	<p>Performance comes from cognitions created through deliberate practice (Ericsson, Krampe, & Tesch-Romer, 1993), which depends upon individuals’ endowments (Ericsson & Charness, 1994; Gardner, 1983; Gardner, 1993).</p>	<p>Individual level entrepreneurial expertise is suggested to result from deliberate practice.</p>	

Year	Reference	Table 2: Excerpt or Summary	Literature Development Narrative
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>	<p>Two cognitive heuristics: mental simulations and counterfactual thinking, are suggested to guide entrepreneurial reasoning and enhance the opportunity identification process.</p>
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 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>	<p>The concept of entrepreneurial bricolage (e.g., tinkering) is introduced into the literature. Entrepreneurs are shown in cases of bricolage, to refuse to accept an environmental limitation, which then allows them to more-effectively meet environmental challenges.</p>
	Cardon, Zietsma, Saporito, Matherne, & Davis (2005: 25)	<p>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.</p>	<p>The lens of affect is suggested to inform prior research on cognition. Through use of metaphors that illustrate the limits of a solely rational perspective of cognition, an affect-based explanation for otherwise inexplicable behavior is offered.</p>

Year	Reference	Table 2: Excerpt or Summary	Literature Development Narrative
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>	<p>A conceptual model of entrepreneurial learning is proposed and the concept of learning asymmetries is introduced to explain the differential exploitation of opportunity.</p>	
Forbes (2005: 623)	<p>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.</p>	<p>Entrepreneurs' tendency to display overconfidence bias due to both differences in individual characteristics and the organizational contexts in which they operate is demonstrated.</p>	
Mitchell (2005: 187)	<p>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.</p>	<p>The process for the creation of entrepreneurs is argued to be dynamic. It is also argued that while entrepreneurs are special, creating them is general. A model of entrepreneurial expertise creation is presented.</p>	

Year	Reference	Table 2: Excerpt or Summary	Literature Development Narrative
Mitchell, Friga, & Mitchell (2005: 653, 666)	<p>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.</p> <p>... intuition is not a unidirectional process of coming to consciousness, but is instead a dynamic process that initially (as it is developing) involves an explicit awareness of the coming-to-consciousness process, and which is subsequently experienced as “having a hunch” or “just knowing” something is an opportunity.</p>	<p>Intuition is reframed in cognitive terms: as a process of “coming to consciousness,” and is then positioned as dynamic cognition.</p>	
Shepherd & DeTienne (2005: 91)	<p>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.</p>	<p>Prior knowledge of a field is argued to enable individuals to identify more “valuable” opportunities, and is supported empirically.</p>	
2006 Baron (2006: 104)	<p>...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.</p>	<p>Entrepreneurs are proposed to identify opportunities by using cognitive frameworks that allow them to identify patterns among seemingly unrelated events, i.e., to connect the dots.</p>	

Year	Reference	Table 2: Excerpt or Summary	Literature Development Narrative
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.	
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.	An information-processing framework of entrepreneurial opportunity recognition is constructed.	
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.	The concept of heuristics is applied in the context of firm capability and significant relationships between the two are found.
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.	The concept of cognitive styles is introduced to the literature and entrepreneurs’ cognitive styles are found to affect their decisions.	

Year	Reference	Table 2: Excerpt or Summary	Literature Development Narrative
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.	A firmer distinction between the entrepreneurial and dynamic capabilities is presented, with cognitive overtones.	
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.	A framework about how the corporate context can create tension between corporate entrepreneurs' role schemas and the event schemas necessary for new venture emergence is examined.	
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.	The concept of learning asymmetries is introduced, and a significant relationship between opportunity identification and learning is found.	
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.	Organizational learning is found to be dependent upon the type of termination script employed.	

Year	Reference	Table 2: Excerpt or Summary	Literature Development Narrative
	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.	The concept is introduced: 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.	The subjective nature of learning and its situated character are suggested to play important and enabling roles in the formation of intentions.
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...	Affect is suggested to be important to entrepreneurial cognition and behavior. Its importance is argued to be shaped by both the environment and the task.

Year	Reference	Table 2: Excerpt or Summary	Literature Development Narrative
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.	A model of how affect (entrepreneurial passion in particular) is transferred to employees through physical mimicry and social comparison is proposed.	
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.	A strong relationship between entrepreneurial intentions and improvisation is found.	
Seawright, Mitchell, & Smith (2008: 1)	This research examines cognitive similarities and differences among Russian and U.S. entrepreneurs and nonentrepreneurs. Manova and multiple discriminant analysis results found similarities between U.S. and Russian experts and U.S. and Russian novices with respect to Arrangements, Willingness, and Ability scripts, but differences in these scripts were found between experts and novices, particularly in Russia.	Expert script-based explanations are shown to explain low rates of entrepreneurship in a market economy that is in the process of transition.	
Mitchell, Mitchell, & Smith (2008: 1)	In this article, we: (1) elaborate on the critical dimensions that represent a multi-construct view of the new transaction commitment mindset and describe ways that these dimensions can be measured; (2) examine the extent to which the recognition of new venture failure impacts the new transaction commitment mindset; and (3) explore the implications of the interaction between failure recognition and the new transaction commitment mindset for an entrepreneur's decision to continue or abandon opportunity creation efforts	A cognitive (e.g., expertise-based) approach to understanding the entrepreneurial mindset in which recognition of past entrepreneurial failure plays a key role is found to be significant.	

Year	Reference	Table 2: Excerpt or Summary	Literature Development Narrative
2009	Smith, Mitchell, & Mitchell (2009: 815)	. . . this paper: (1) clarifies the nature of the relationship between entrepreneurial expert scripts and constructs that might represent an entrepreneurial mindset at the individual level of analysis, (2) identifies analogous relationships at the economy level of analysis where the structure found at the individual level informs an economy-level problem, (3) presents a NAFTA-based illustration analysis to demonstrate the extent to which cognitive findings at the individual level can be used to explain economy-level phenomena, and (4) extrapolates from our analysis some of the ways in which script-based comparisons across country or culture can inform the more general task of making information processing-based comparisons among entrepreneurs across other contexts.	Recomposes entrepreneurial scripts at the individual level to compositionally consistent scripts at the economy level to explain the resolution – or lack thereof – of NAFTA trade issues. Cross-level cognitive research is demonstrated. Results are significant.
	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.	A dynamic relationship between the level of improvisation in opportunity selection and in opportunity execution is found.
	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.	Self-regulation theory is applied to develop a theory of the cognitive and behavioral consequences of entrepreneurial passion.

Year	Reference	Table 2: Excerpt or Summary	Literature Development Narrative
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>	Expert entrepreneurs are found to be 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)	<p>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.</p>	Further support for effectual logic is provided. Shows that expert entrepreneurs are more likely to use effectual logic, e.g., focus on intangible resources, co-creation of value, and stakeholder relationships.	
Read, Song, & Smit (2009)	<p>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.</p>	A way to measure effectuation logic is developed. Most of the principles of effectual logic are found to be positively related to new venture performance.	

Year	Reference	Table 2: Excerpt or Summary	Literature Development Narrative
	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.	A prototypical approach for identifying the script-based components of new venture formation expertise and for distinguishing entrepreneurial expertise in individuals is explained.
	Ucbasaran, Westhead, & Wright (2009: 102, 111)	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.	An inverse U-shaped relationship is found 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.	The notion that entrepreneurs employ prototypes to recognize opportunities is challenged. Instead, the idea that recognizing opportunities involves cognitive processes of structural alignment is found.

Table 3: Research which implicitly or explicitly utilizes elements of socially situated cognition

Year	Reference	Table 3: Excerpt or Summary	Developmental Narrative
2003	Royer (2003: 6, as cited by Corbett, Neck & DeTienne [2007])	“This sentiment [widespread belief in the new venture’s inevitable success] typically originates, naturally enough, with a project’s champion; it then spreads throughout the organization, often to the highest levels, reinforcing itself each step of the way. The result is what I call collective belief, and it can lead an otherwise rational organization into some very irrational behavior”	One of the early observations concerning distributed cognition suggests that collective belief is relevant to the assessment of project success or failure.
2007	West (2007: 78)	While the founders and each top manager will have individual perspectives and cognitions about their new venture, it is a collective perspective or a collective knowledge structure at the team level that guides the direction of the venture. Collective cognition in new ventures is therefore an important domain to explore, and it is fundamentally different from individual cognition or from the aggregation of individual cognitions.	The idea that cognition is distributed within teams (across individuals) is suggested here also. This research emphasizes the importance of seeing cognition as collectively distributed across teams and that this has implications for decision making and action.
2007	Corbett, Neck, & DeTienne (2007: 849)	Through an examination of 11 longitudinal case studies of breakthrough innovation we show that corporate entrepreneurs do, in fact, develop scripts for terminating projects.	The corporate social situation is shown to be one where collective cognitions – that is, distributed cognition – play an important role in entrepreneurial decision making.
2008	Nicolaou, Shane, Cherkas, Hunkin, & Spector (2008a: 168)	<p>Genetic factors might influence the tendency of people to engage in entrepreneurship through a variety of complementary mechanisms. First, genes might have direct effects on chemical mechanisms in the brain that predispose people with that genetic composition to engage in entrepreneurial activity. ...</p> <p>Second, genes might predispose people to develop individual attributes that affect the tendency of people to engage in entrepreneurship (White et al. 2006, 2007). ...</p> <p>Third, genes might affect the tendency of people to select into environments more favorable to entrepreneurial activity, a phenomenon called <i>gene-environment correlation</i> (Plomin et al. 1977, Kendler and Eaves 1986). ...</p>	The influence of genetic factors on entrepreneurs’ thought, also suggests the embodied nature of entrepreneurial cognitions.

Year	Reference	Table 3: Excerpt or Summary	Developmental Narrative
		Fourth, genes might make some people more sensitive than others to environmental stimuli that increase the likelihood of engaging in entrepreneurial activity. This tendency ... [is] called <i>gene-environment interaction</i> ...	
	Nicolaou, Shane, Cherkas, & Spector (2008b: 7)	We found that, in the particular sample we examined, between 37 and 42 percent of the variance in the tendency of people to engage in entrepreneurship is accounted for by genetic factors. A substantial part of this variance was mediated by the psychological trait of sensation seeking, suggesting that genes affect the tendency [across] people to engage in entrepreneurship by affecting the distribution of sensation seeking	Further evidence that genes can influence the tendency to engage in entrepreneurship is presented.
2009	De Carolis, Litzky, & Eddleston (2009: 527, 532)	Our results confirm that social networks and relational capital enhance levels of illusion of control, which is directly related to the progress of new venture creation. ... individuals will have attitudes and behaviors similar to those with whom they interact. Applying the implications of these theories to networks, it can be argued that network formation influences individual cognition.	The social network in which individuals are situated also influences their entrepreneurial cognition and thinking.
	Zhang et al. (2009: 93)	... we found that females have a strong genetic influence and zero shared-environmental influences on their tendency to become entrepreneurs. In contrast, males show zero genetic influence, but a large shared-environmental influence. Extraversion and neuroticism mediate the genetic influences on women's tendency to become entrepreneurs, whereas extraversion mediates shared-environmental influences on men's tendency to become entrepreneurs.	Further evidence is also found to suggest that genetics can explain some differences between male and female entrepreneurs and variations in tendency to engage in entrepreneurship.
	Haynie & Shepherd (2009: 695)	We define cognitive adaptability as the ability to effectively and appropriately change decision policies (i.e., to learn) given feedback (inputs) from the environmental context in which cognitive processing is embedded. Research suggests that while such a cognitive task is difficult to achieve (Rozin, 1976), it is positively related to decision performance in contexts that can be characterized as complex, dynamic, and inherently uncertain (Earley & Ang, 2003). The entrepreneurial context exemplifies such a decision environment.	A 36-item inventory to assess cognitive adaptability of individual entrepreneurs to their social situation is developed.
2010	Cornelissen & Clarke (2010: 552)	Underpinning the model is a theory of sensemaking as a socially situated process by which individuals construct meaning while speaking. This definition of sensemaking applies to the context of new ventures – where the	The idea that sensemaking is situated and that it evolves through an embodied process of action is introduced.

Year	Reference	Table 3: Excerpt or Summary	Developmental Narrative
		demands of online sensemaking require that individual entrepreneurs think by speaking, meaning that conscious thought emerges in the act of speaking with others.	
	Haynie, Shepherd, & Patzelt (2010: 238)	Cognitive adaptability is important in an entrepreneurial context because contemporary business environments are characterized by rapid, substantial, and discontinuous change (Hitt, 2000). ... Thus, it is important for entrepreneurs to cultivate a mindset that enables adaptable decision making; a mindset that is both self-reflective and self-regulatory, and that allows the individual to think beyond biases embedded in existing sense-making mechanisms so as to appropriately interpret the cause-effect relationships represented by environmental feedback (Hitt; McGrath & MacMillan, 2000).	Individuals with higher cognitive adaptability are found to be more successful in adapting to the changes in their task-related situation.
	Haynie, Shepherd, Mosakowski, & Earley (2010: 217)	We develop a framework to investigate the foundations of an ‘entrepreneurial mindset’ – described by scholars as the ability to sense, act, and mobilize under uncertain conditions. We focus on metacognitive processes that enable the entrepreneur to think beyond or reorganize existing knowledge structures and heuristics, promoting adaptable cognitions in the face of novel and uncertain decision contexts.	The idea that adaptable cognitions, e.g., metacognitions, are situated in the entrepreneurial environment is introduced.
2011	Grégoire, Corbett, & McMullen (2011: 1445)	In the broad field of cognitive science, for instance, there remains lively debates about the nature of cognition as a computational phenomenon that is primarily articulated ‘within the mind’, or as an embodied/situated phenomenon that emerges from interactions between the brain, body, and world (cf. Gibbs, 2006 vs. Rupert, 2009). ... Yet over and above their differences, these theoretical positions share common ground in the idea that understanding human behaviour requires consideration of mental representations and processes across level of analysis.	A review and proposal encourages researchers to further pursue theoretical, methodological, and empirical work on situated and embodied cognition in entrepreneurship.
	Mitchell, Randolph-Seng, & Mitchell (2011: 774)	To date, entrepreneurial cognition has been explained largely in terms of what social cognition researchers commonly term <i>boxologies</i> : seemingly static representations of abstract, disembodied cognitive structures (e.g., biases, heuristics, scripts, etc., as described in Mitchell et al., 2007). ... Recently, an approach that integrates social psychology and situated cognition research, termed <i>socially situated cognition</i> (SSC), has emerged (Smith & Semin, 2004). ... The SSC approach is centered on four themes, [cognition is]: action oriented, (2) embodied, (3) situated, and (4) distributed.	Socially situated cognition (SSC) is proposed as a framework for moving from static to dynamic entrepreneurial cognition research, which is based on four major SSC themes: that entrepreneurial cognition is: (1) action-oriented, (2) embodied, (3) situated, and (4) distributed.

Year	Reference	Table 3: Excerpt or Summary	Developmental Narrative
2012	Falck, Hebllich, & Luedemann (2012: 39)	<p>We incorporate the concept of social identity into entrepreneurship and analyze the determinants of having entrepreneurial intentions. We argue that an entrepreneurial identity results from an individual's socialization. This could be parental influence but, as argued in this paper, also peer influence.</p> <p>... we find that having an entrepreneurial peer group has a positive effect on an individual's entrepreneurial intentions.</p>	Evidence that entrepreneurial intentions and entrepreneurial identity are situated is reported.
	Mitchell & Shepherd (2012: 369)	<p>Our research also captures three of the four key elements called for in a socially situated view of entrepreneurial cognition... That is, we adopt an action-oriented perspective with our focus on strategic decision making in opportunity pursuit, which plays an important role in entrepreneurial action... Knowledge codification itself likewise represents a kind of embodied action, in that it requires more than just saying, but rather physically recording knowledge that has been converted into identifiable rules and relationships... Similarly, our approach is implicitly situated in our positioning of decreased decision incongruence as a way to increase an individual's ability get 'buy-in' from key stakeholders... thereby enabling coordination, higher-quality group decision making and better firm performance.</p>	The importance of socially situated cognition is noted in linking strategic decision making to action, and knowledge codification to embodiment, while emphasizing the situated communicative context.
2013	Valliere (2013: 433)	<p>... cognitive and structural factors create a situated attention for the individual that mediates between changes in the environment and the discovery or creation of opportunities to act. So it is at this point where entrepreneurial alertness must arise and come in to play – but a mechanism for the emergence of this alertness has not previously been proposed.</p>	One of the first models of situated entrepreneurial alertness is developed.
	Zheng & Mai (2013: 197)	<p>... we propose that founding teams' transactive memory systems (TMS) situated in the unique contextual conditions prevalent in most emerging economies will affect their perceptions regarding how to bridge the knowledge gaps arising from surprises. ... Our results suggest that in emerging economies where market supporting institutions are deficient, founding teams with strong TMSs are less inclined to acquire external knowledge but are more prone to improvise in response to surprises than founding teams with weak TMSs.</p>	Teams' transactive memory systems, as one of the forms of team cognition, are suggested to be situated and influence team's inclination to acquire knowledge.

Year	Reference	Table 3: Excerpt or Summary	Developmental Narrative
2014	Baucus, Baucus, & Mitchell (2014)	In this chapter, we seek to map the terrain in the brain where soft coding meets hard coding. This mapping task is consistent with and may help to further amplify recent developments in cognitive psychology and entrepreneurial cognition research that integrate action, embodiment and social situation in explanations of entrepreneurial cognition (cf. Mitchell et al., 2011; Smith & Semin, 2004).	The idea is presented that in terms of neurophysiology, entrepreneurs' brains are similar to others'; but in terms of knowledge and experiences they are different. The cases of affect and motivation are presented and demonstrate the embodied nature of entrepreneurial cognition.
2014	Clarke & Cornelissen (2014: 383)	...we outline a more dynamic, embodied and social perspective of entrepreneurial cognition [focusing] ... on the formative role of language in shaping the ideas of entrepreneurs and their attempts to gain a broader understanding and recognition of a new venture from relevant stakeholders and resource providers. We describe the theoretical underpinnings of this approach, conceptualize key constructs and outline a number of emergent areas for future research.	The formative role of language is articulated; and its function in enabling the attraction and retention of stakeholders in a distributed-cognition resource space is described, along with explanatory theory.
	Corbett (2014: 398)	...entrepreneurial growth cognitions [are] the mental representations of how... groups of entrepreneurs can develop rapid-, big-growth-oriented firms right from the start.”	Growth cognitions –distributed within firms – are suggested to be a particular type of entrepreneurial cognition that is helpful to theoretical progression.
	Drnovšek, Slavec, & Cardon (2014: 227)	We ... extend current work on entrepreneurial cognitions by suggesting that cognition is distributed among group processes and the environment. We propose a culturally situated model of entrepreneurial emotions (e.g., entrepreneurial passion) and cognitions (e.g., self-efficacy), and explore how these impact venture performance.	The idea that entrepreneurial emotion is not only individual but may also be distributed among groups of individuals is advanced; and its impact on venture performance explanations is assessed.
	Forbes (2014: 364)	The quantity and quality of entrepreneurial activity in a society are critically influenced by the extent to which people in that society possess knowledge relevant to the practice of entrepreneurship ... there has emerged a rich set of resources that help people acquire entrepreneurship-related knowledge ... characterized by (1) large-scale codification of entrepreneurial knowledge through the development of books, periodicals, blog posts, podcasts, videos and other media that distill portions of what practicing entrepreneurs and others have learned, and (2) the formation of networks, markets and other social structures devoted specifically to the exchange of this knowledge.	The importance of relevant knowledge being distributed within a society, and of the transmission mechanisms of that knowledge, is argued to affect the practice of entrepreneurship within that society. The increasingly important role of information technology in distributing entrepreneurial cognitions is emphasized.

Year	Reference	Table 3: Excerpt or Summary	Developmental Narrative
Kasperova & Kitching (2014: 448)	The embodying of entrepreneurial identity has wider implications for the study of entrepreneurship. Entrepreneurial cognition research, for instance, acknowledges the embodied nature of cognitive processes (Mitchell et al., 2011; Grégoire et al., 2011); studying entrepreneurial orientations, motivations and decision making without reference to the body will be incomplete. Categories such as “mumpreneurs”, male, female, ethnic minority, older and disabled entrepreneurs are of course socially and culturally constituted. That these particular identities emerge from embodiment is self-evident, but the materiality of such embodiment and its effects on identity is usually left implicit.	An embodied conceptualization of entrepreneurial identity is proposed and it is argued that such identities are also socially and culturally constituted, suggesting the situated and distributed nature of entrepreneurial identity.	
McMullen, Wood & Palich (2014: 353)	At its core, entrepreneurship involves individuals interacting with their social and natural environments such that new possible thoughts, feelings and actions emerge that lead to the creation of new understandings, artifacts, arrangements and relationships that transform individuals, organizations, economies and societies. [We have] ... sought to articulate the nature of the opportunity that neuroscience provides entrepreneurial cognition researchers.	A systematic role for the development of dynamic cognitive explanations through the use of entrepreneurial neuroscience is suggested.	
Mitchell, Mitchell, Zachary, & Ryan (2014)	... we model the socially-situated cognition notion that 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. We observe that ... inner environments form a foundation whereby variations in a dynamic outer environment have more impact on exchange creation than would be expected when looking at variations in the inner environment alone.	An agent-based simulation demonstrates how the moment-to-moment interaction of a cognitive inner environment with the outer cognitive environment demonstrates the relative influence of outer vs. inner environments on outcomes such as exchange formation.	
Randolph-Seng, Williams, & Hayek (2014: 132)	[We] introduce entrepreneurial cognition researchers to the area of non-conscious cognition from the broader social cognition literature and integrate this literature with research done in entrepreneurial intentions and intuition. In doing so, we introduce the concept of entrepreneurial self-regulation as the explanatory mechanism between conscious and non-conscious cognitive processes in the entrepreneurial domain.	Non-conscious cognition is theorized to impact entrepreneurial thinking through the mechanism of self-regulation.	
Sarasvathy (2014: 448)	The recognition that cognition is embodied within entrepreneurs as unique people sets the stage for an examination of both formal and informal models as tools for entrepreneurial cognition research. To minimize the loss in	Embodied “even-if” conceptualizations are argued to explain effectuation in	

Year	Reference	Table 3: Excerpt or Summary	Developmental Narrative
		fidelity, as researchers construct models to represent more complex phenomena, models must be: simple, parsimonious, observable and interesting.	entrepreneurship in cognitive terms.
		... the theory of effectuation is introduced as a constructive model, characteristic of a science of the artificial: where thinking-based heuristics are utilized to unpack its behavioral assumptions into embodied even-if conceptualizations that explain entrepreneurship in cognitive terms.	
Spivack, McKelvie, & Haynie (2014: 651)		We identify that “addicted” habitual entrepreneurs may experience symptoms typical of other behavioral addictions manifesting as <i>obsessive thoughts, withdrawal/engagement cycles</i> , tight ties of the behavior to feelings of <i>self-worth, tolerance, neglect</i> of previously important friends and activities; and <i>negative outcomes</i> – emotional outcomes (e.g., guilt, lying, and withholding information about the behavior from others), increased or high levels of strain, and negative physiological/health outcomes.	The embodiment stream of research is extended by showing that habitual entrepreneurs can demonstrate “addicted” behavior, which can influence both their entrepreneurial and moral judgment.
Wood, Bradley, & Artz (2014, in press)		Do entrepreneurs have optimism in subsistence economies, and if so, how does it influence entrepreneurial outcomes? We investigate this question by taking the situated view of optimism. We reason that variations in optimism are a function of the type of opportunity pursued and the diversity of opportunity information entrepreneurs receive and that optimism plays an intervening role between these antecedents and business growth.	Entrepreneurs’ optimism, is found to be an important determinant of business growth, is suggested to be a socially situated cognitive phenomenon, providing both evidence regarding these constructs; and that the framing of dynamic cognition research in terms of the socially situated view is showing potential to provide additional explanatory power in entrepreneurial cognition research.

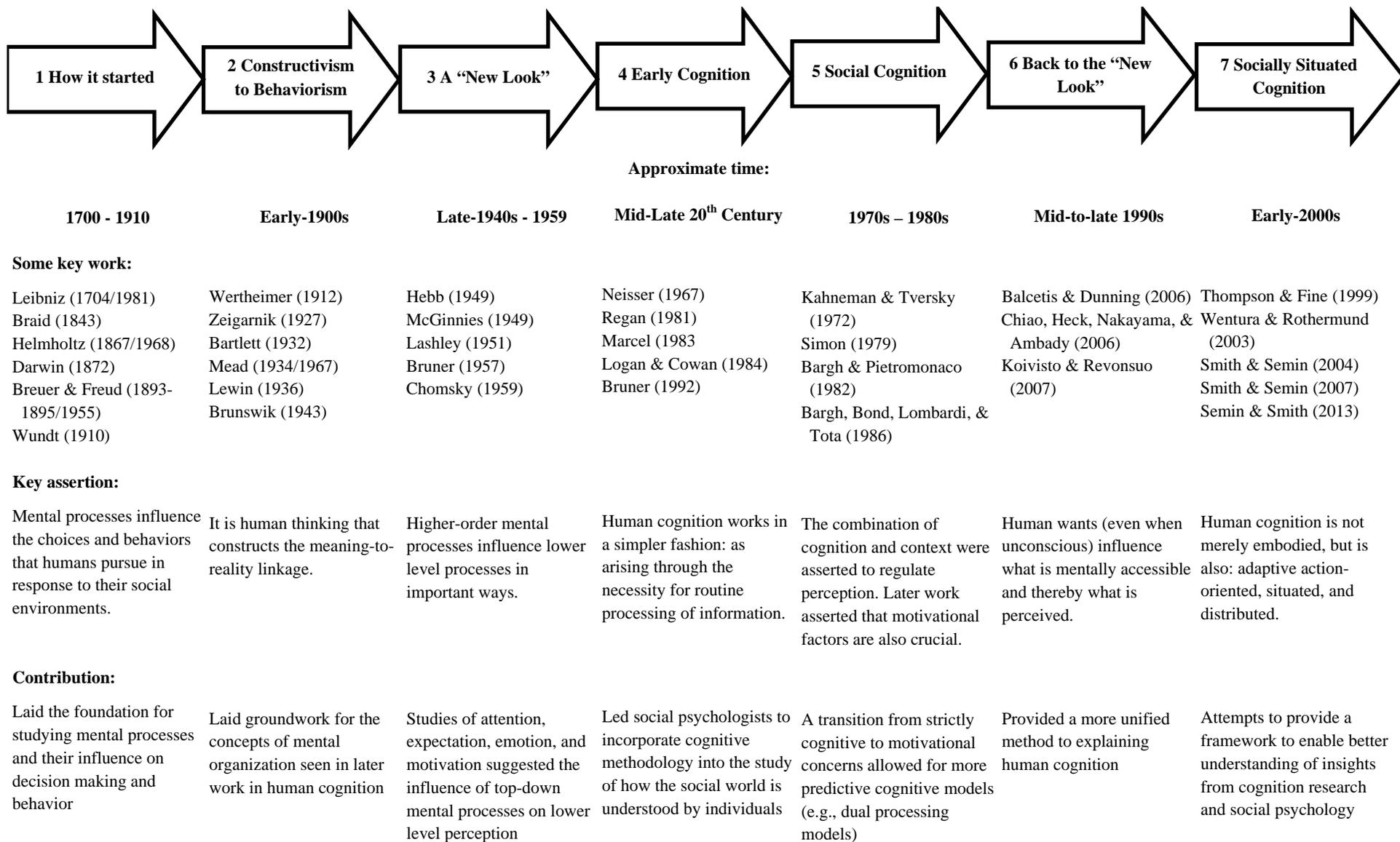


Figure 1. Toward a more dynamic view of social cognition: A summary

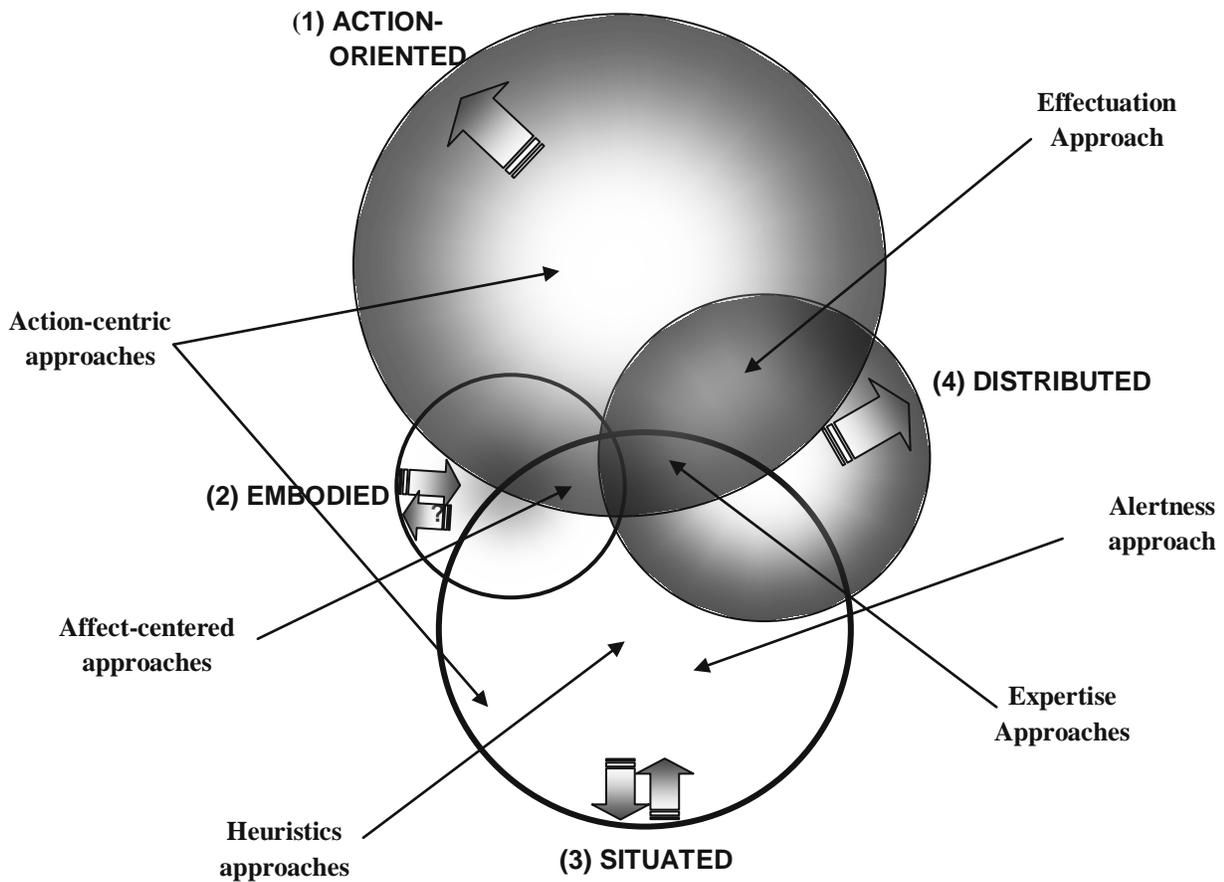


Figure 2. The four themes of socially situated cognition, their suggested relationship to existing approaches, and estimates of future research growth