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EMOTIONS, ETHICS AND DECISION-MAKING

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CHAPTER 2

A MATTER OF FEELING? THE ROLE OF INTUITION IN ENTREPRENEURIAL DECISION-MAKING AND BEHAVIOR

Eugene Sadler-Smith, Gerard P. Hodgkinson and Marta Sinclair

ABSTRACT

In recent years there has been a growth of interest in the role played by intuition in entrepreneurial cognition and behavior. However, the significance of the role of affect in intuitive judgment has been underplayed by entrepreneurship researchers. In response to this theoretical and empirical shortcoming we propose recognition-primed decision-making (RPD), the somatic marker hypothesis (SMH), and dual-process theories (in particular Cognitive-Experiential Self-Theory: CEST) as complementary frameworks for advancing understanding of the dynamic interplay of cognition and affect in entrepreneurial judgment and decision-making.

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INTRODUCTION

In recent years a growing number of researchers have turned their attention to the role played by intuitive judgment in entrepreneurial cognition and behavior (Acedo & Florín, 2006; Allinson, Chell, & Hayes, 2000; Chapman, 2000; Dutta & Crossan, 2005; Gaglio, 2004; Hodgkinson & Sparrow, 2002; Kakkonen, 2005; Mitchell, Friga, & Mitchell, 2005; Politis, 2005; Sadler-Smith, 2004; Schindehutte, Morris, & Allen, 2006). There are at least two reasons for this burgeoning interest: firstly, business venturing often encompasses a degree of uncertainty and ambiguity which decision makers alleviate by employing intuitive judgments (Khatri & Ng, 2000; Klein, 2003; Shapiro & Spence, 1997); secondly, it has long been recognized that intuition supports creativity, innovation, and foresight (Agor, 1989; Bastick, 1982; Hayashi, 2001; Isenberg, 1984; Parikh, Neubauer, & Lank, 1994; Rowan, 1986), vital ingredients for business start-up and growth (Bilton, 2007; Kirby, 2002; Ray & Myers, 1989). Mitchell et al. (2005) defined entrepreneurial intuition, as follows: "The dynamic process by which entrepreneurial alertness cognitions interact with domain competence (e.g., culture, industry, specific circumstances, technology, etc.) to bring to consciousness an opportunity to create new value" (p. 667). Their definition of entrepreneurial intuition, which incorporates the insights of a number of earlier scholarly writings, including Schneider and Detweiler (1987), Moscovitch (1989), Schacter (1989), and Gordon (1992), provides a useful basis for theorizing the attributes of, and antecedents to, entrepreneurial intuition. A central message of the present chapter, however, is that contemporary theory and research on entrepreneurial intuition has much to gain by drawing upon more recent advances in social cognition, cognitive psychology, and cognitive neuroscience in order to formulate a more complete explanation of the role of intuition and affect in the entrepreneurial process.

Specifically, we seek to address the role played by affectively charged judgments – the phenomenon popularly known as "gut feel" – in entrepreneurial cognition and behavior. We propose recognition-primed decision-making (RPD) (Klein, 1998, 2003), the somatic marker hypothesis (SMH) (Bechara, Damasio, Tranel, & Damasio, 1997), and cognitive-experiential self-theory (Epstein, 1994) as complementary frameworks for advancing understanding of the dynamic interplay of cognition and affect in entrepreneurial judgment and decision-making.

RECOGNITION-PRIMED DECISION-MAKING

Critiques of rational analysis in organizational decision-making can be traced back at least as far as the writings of AT&T executive Chester I. Barnard in the appendix to his book *The Functions of the Executive* (Barnard, 1938). In this treatise entitled "The mind in everyday affairs," based on a lecture he gave to the engineering faculty at Princeton, Barnard drew a distinction between "logical mental processes" and "non-logical mental processes." The former encapsulated conscious thinking (i.e., reasoning) expressible in words or other symbols. He maintained that individuals processed knowledge within the nonlogical mode of cognition unconsciously or without conscious effort. Hence, by definition, nonconscious processes could not be analyzed reliably through self-reflection. Barnard's explanation of these processes was, not surprisingly, limited with regard to its level of scientific rigor. It was not until some 20 years later that Herbert Simon, through his notion of "bounded rationality" (Simon, 1957), built upon Barnard's insights to develop a plausible account of the role of intuition in decision-making.

Given the cognitive limitations of decision makers, relative to the complexity of their environments, human behavior is intendedly rational, but only in so far as this is possible within the bounds of the human information-processing system; hence, human beings "satisfice" rather than maximize in decision-making. Simon (1957) argued that decision makers set a minimally acceptable standard that must be met, and search only until the first available alternative is found that meets that threshold criterion (see also: March & Simon, 1958; Simon, 1989, 1997). Simon's position on the role that intuition plays is summarized thus: "Intuition and judgment – at least good judgment – are simply analyses frozen into habit and the capacity for rapid response through recognition" (Simon, 1987, p. 63). According to this view, experts store pertinent information in long-term memory in the form of coherent patterns, expert judgment being a product of pattern recognition. Simon (1987) also acknowledged the role of emotion in decision-making, but concluded that "emotion-driven intuition" results in "irrational decisions." It should be noted that in this conception intuitions are neither emotion-driven nor emotional decisions.

Simon's view of intuition as "analyses frozen into habit" or pattern recognition is commensurate with the perspective of naturalistic decision-making (NDM). The latter approach examines the ways in which people use their experience to make decisions in field settings (as opposed to the

artificial laboratory settings employed in other areas of decision research) under critical conditions (Klein, 1997; Zsambok, 1997). In other words, emphasizing the crucial role of situation awareness in field settings, NDM researchers focus upon the ways in which decision makers deploy intuitive processing in situ in circumstances where the opportunity to engage in deliberative, reasoned analysis is limited by pressures of time, complexity, and incompleteness of information. By way of illustration, Gary Klein and his colleagues have examined the decision choices made by highly experienced firefighters in the US Army. This body of work, which gave rise to the development of the RPD model, has shown that such individuals do not necessarily follow a rational choice model in which several options are identified and weighed-up at each stage in the process. Instead, many of the respondents in Klein's studies identified a single course of action and followed it through:

> *Fire-fighters in a one storey building which is on fire*: the commander and his team spray the fire with water but the fire roars back at them. This just doesn't fit with experience. They try again – and again dousing with water doesn't work – the fire flares back. The commander senses something is not right. He decides to order his team to leave the building immediately. Seconds later the floor they had been standing on collapses – unbeknownst to them the building had a basement and this is where the fire was emanating from. (Klein, 1998, p. 32)

In this case the fire ground commander, as a result of learning, experience, and accumulated expertise had an extensive knowledge base stored as complex associations and action scripts which afforded him a highly tuned awareness of the situation. Consequently, the commander had enough of a "sense of unease" that things were "out of kilter" that he decided to evacuate the building immediately.

At first glance, Klein's RPD model implies a use of intuition that seems to accord closely with the analysis-frozen-into-habit view of Herbert Simon. However, a distinction exists between the understanding of intuition offered by Simon (i.e., analyses frozen into habit with the capacity for fast recognition and response) in which the issue of affect is overlooked or at least played-down, and more recent conceptions (Dane & Pratt, 2007; Sadler-Smith & Shefy, 2004; Sinclair & Ashkanasy, 2005), in which the role played by affect in intuitive judgment is given a greater emphasis. Commensurate with the latter view it is clear from the case studies upon which Klein's RPD model is based that affect is also of vital importance. This is the case, for example, when an experienced decision maker's contextual awareness results in a particular combination of cues not "feeling" right, but without him or her being able to say why. Decision makers involved

in the sorts of life-or-death situations examined by NDM researchers are often unable to reflect upon the reasoning mechanisms underpinning their judgments. Indeed, in a number of such cases decision makers have even been known to misattribute their success to extra-sensory perception (ESP) rather than their own underlying expertise (Klein, 1998, p. 33). However, not withstanding the undoubted value of the RPD model as an explanation of expert intuition in field settings, a more complete account needs to embrace a wider conception of intuition than that offered by Klein (1998, 2003). It should recognize the fact that decision makers base their judgments not only on cognitive responses but also on affective responses, underpinned by distinct neural mechanisms.

THE SOMATIC MARKER HYPOTHESIS

At a psychological level, a preliminary understanding of affect's role in intuitive judgment has benefited significantly from research in cognitive neuroscience and related fields that has explored the somatic aspects of decision-making. For example, Bechara et al. (1997) compared the performance on a high-risk gambling task of normal participants and patients with damage to the ventro-medial prefrontal cortex (VMPC) – a brain region implicated in the induction of emotions. Damage to the VMPC region can result in the impoverishment of "decision-making apparatus to a dramatic degree" (Damasio, 1999, p. 280). In an experimental setting, Bechara et al. (1997) observed that normal participants (i.e., ones without damage to the prefrontal cortex) began to choose advantageously before they were consciously aware which strategy worked best; moreover, they generated anticipatory skin conductance responses (SCRs) before they exercised a risky choice and before they became consciously aware of the strategy they were adopting. In contrast, patients with prefrontal cortex damage continued to choose disadvantageously; even after they realized the correct strategy, they failed to demonstrate any anticipatory SCRs. These mechanisms are not only implicated in the processing of emotionally arousing tasks, but also in several higher-order cognitive activities, such as planning and decision-making (Adolphs & Damasio, 2001). It is also worth noting that the amygdala, as well as the VMPC, is involved in processing that is automatic, fast, and involuntary (Le Doux, 1996).

Taken as a whole, the above findings indicate that the autonomic responses associated with intuitions based upon previous experience and emotional states have the potential to guide decision-making and outcomes

in advance of conscious awareness. It has been argued that the intuitive system underpinning such processes may have evolved in humans earlier than did the rational system (Cappon, 1993, 1994; Epstein, 1994). Viewed from such an evolutionary perspective, the pattern of somatic and visceral signals from the body acts as a warning; these signals are adaptive in that they allow the decision maker to anticipate the "pain" or "pleasure" of particular outcomes (Bechara, 2004; Le Doux, 1996; Shafir & LeBouef, 2002).

In explaining the neuro-psychological processes underpinning the SMH, Bechara (2004) proposed a "body loop" mechanism. According to this view, a somatic state is actually re-enacted and its signal relayed back to pertinent cortical and sub-cortical regions of the brain, i.e., those neural structures underpinning conscious and nonconscious decision processes. Previously encountered situations and stored representations thus play a key role. When an emotion has been expressed more than once, representations of it are formed in the somato-sensory and insular cortices. The body loop may be by-passed, and a fainter image of the emotional or somatic state created. Hence, bodily feedback is "imagined" and represented cognitively in working memory and thus influences feelings and decisions. Bechara refers to this mechanism as the "as-if" loop.

COGNITIVE-EXPERIENTIAL SELF-THEORY

Entrepreneurial individuals embrace change readily, identify and pursue opportunities, and generate innovative ideas, all of which are conducive to the use of intuition (Allinson et al., 2000). As highlighted above, intuition appears to operate beyond the realms of rational processes and encompasses affective elements. Hence, a plausible psychological framework for the study of intuition and affect in entrepreneurial decision-making must be capable of accommodating recent developments concerning the limits of rationality, the significance of nonconscious pattern recognition, and the role of affect in organizational decision-making. We maintain that dual-process formulations of cognition (Chaiken & Trope, 1999; Gilovich, Griffith, & Kahneman, 2002) present the fields of management and entrepreneurship with such a framework.

One theory, typical of dual-process conceptions more generally, that provides a particularly convenient framework for advancing understanding of the complementary roles played by analysis and intuition in entrepreneurial decision-making is the Cognitive-Experiential Self-Theory (CEST),

developed by Epstein and his colleagues (Denes-Raj & Epstein, 1994; Epstein, 1991, 1994, 1998, 2000; Epstein & Pacini, 1999; Epstein, Pacini, Denes-Raj, & Heier, 1996; Epstein, Pacini, & Norris, 1998; Pacini & Epstein, 1999). Epstein et al. (1996, p. 391) maintain that: "people process information by two parallel, interactive systems", which interface harmoniously but operate in different ways. The rational system, falling within the realms of conscious control, is analytical in nature, whereas the experiential system operates at a nonconscious level, on the basis of affect and intuition. In this model the experiential mode acts as the default, unless the rational processing mode is consciously activated. More specifically:

> "The rational system... is conscious, relatively slow, analytical, primarily verbal, and relatively affect free... The experiential system...is preconscious, rapid, automatic, holistic, primarily nonverbal, intimately associated with affect...". (Pacini & Epstein, 1999, p. 972)

Epstein and his colleagues maintain that the extent to which rational-analytical and/or experiential-intuitive processing predominates is an interactive function of dispositional and situational factors, thus implying not only a dynamic relationship between the two cognitive systems but also a complex structure within each system (for details see Sinclair, Ashkanasy, Chattopadhyay, & Boyle, 2002). This line of reasoning has found support in recent cognitive neuroscience research that has identified separate neural pathways for certain affective and cognitive processes (for further details see the discussion of the SMH, above, and: Adolphs & Damasio, 2001; Bechara, 2004; Damasio, 1994, 1999; Isen, 2000; Le Doux, 1996) and differential patterns of activation across several specific regions of the brain (Lieberman, 2000, 2007; Lieberman, Jarcho, & Satpute, 2004).

CEST is but one of a family of dual-process theories, the essential elements of which closely resemble one another (Chaiken & Trope, 1999; Gilovich et al., 2002). Indeed, such are the overall similarities among the various dual-process conceptions that Stanovich and West (2000) have proposed the generic terms System 1 and System 2, with a view to characterizing at a more general level of abstraction the basic idea that two systems underpin human cognition. The essential differences between the intuitive system (System 1) and the analytical system (System 2) are summarized in Table 1. For a more detailed summary of the distinction between these two systems in the context of fundamental psychological research on intuition see Hodgkinson, Langan-Fox, and Sadler-Smith (2008).

Table 1. Characteristics of the Intuitive and Analytical Systems.

Intuitive System	Analytical System	Sources
Affect-laden; comparatively fast in operation, slow in formation; parallel and holistic; involuntary; cognitively undemanding; imagistic/narrative-based; unavailable to conscious awareness	Affect free; comparatively slow in operation, fast in formation; serial and detail-focused; intentional; cognitively demanding; abstract/symbolic-based; open to conscious awareness	Epstein (1994); Lieberman (2007); Sloman (2002); Smith and DeCoster (1999); Stanovich and West (2000)

INTUITION AND AFFECT IN DECISION-MAKING

Intuitions are defined as "affectively charged judgments that arise through rapid, non-conscious and holistic associations" (Dane & Pratt, 2007, p. 40). Associations above and below the level of conscious awareness can include the level of danger or opportunity and the feelings of elation or disappointment that a particular pattern of experience may have induced in past successes or failures. One implication of this assertion is that memories may be embodied in a resonating emotion as somatic markers that can be re-activated in a context-congruent situation (Bechara, 2004; Damasio, 1994). Hence, patterns, or at least the judgments that arise from the use of those patterns, may be affect-laden.

It is conceivable that intuitive judgments are differentiated in terms of the strength of the "affective tag" associated with the judgment (Finucane, Alhakami, Slovic, & Johnson, 2000; Slovic, Finucane, Peters, & MacGregor, 2004). A continuum can be envisaged in which the nonconscious cognitive processes that support the interpretation of the relevant environmental cues, their matching with an extant pattern or the detection of a mis-match (when the decision maker recognizes that something is "out of kilter" or simply "doesn't feel right" – see Klein, 1998) are accompanied to a greater or lesser extent by affect (i.e., an affective tag in Finucane et al.'s terminology).

Our proposal for the differential strength of affect in intuitive judgments is in keeping with the argument for the importance of the affect heuristic more generally in human judgment put forward by Finucane, Slovic, and colleagues, who in turn built upon the work of Zajonc (1980). Slovic et al. (2004) suggested that we each have our own "affect pool" which contains positive and negative markers that consciously or unconsciously "tag" to

varying degrees "all of the images in people's minds" (Slovic et al., 2004, p. 314). The affect pool is implicated via an involuntary "sensing" process when people make a wide variety of judgments, including probability judgments (Slovic, 2000).

At the onset of the decision-making process affect may assist or impede access to intuitive processing; for example, negative mood states may predispose an individual to engage in rational analyses to a greater extent (Elsbach & Barr, 1999; King, Burton, Hicks, & Drigotas, 2007; Sinclair et al., 2002). Moreover, the experiences and the associated learning through which intuitions are acquired may be affectively encoded, thus making affect an integral element of the mental models and mental simulations upon which intuition draws (cf. Forgas, 1994, 1995; Klein, 1998; Kahneman & Tversky, 1982). This argument is consistent with the notion of affective tags advanced by Slovic and his colleagues. If, as argued by Slovic et al. (2004), mental representations are affectively tagged, this is likely to be as true of the mental representations that underpin entrepreneurial decisions as those underpinning other forms of decision-making. The affective charge (Dane & Pratt, 2007) or tag associated with a particular business venturing experience may be used as a short-cut in opportunity recognition and decision-making (cf. Blake, 2008, p. 47) and opportunity recognition.

The question of which decisions engage the body loop and which engage the as-if loop is the subject of on-going investigations. Bechara (2004) argues that in decision-making under certainty, i.e., where the outcome is predictable and explicit, it is the as-if loop that is activated, whereas in decision-making under uncertainty, i.e., where the outcome is unpredictable or unknown and thus cannot be estimated, the body loop proper is activated. Although the detailed program of scientifically rigorous empirical work to validate this theory has yet to be undertaken, nevertheless, it seems reasonable at this juncture to speculate that the various loop mechanisms postulated by Bechara (2004), i.e., the "body loop" and the fainter "as-if" loop, might account for variations in the degree of affect accompanying intuitive-based judgments in many decision processes, including those involving the perception and judgment of new business opportunities. It is to this area of decision-making and judgment that we now turn our attention.

INTUITION AND ENTREPRENEURSHIP

In a review of the contributions of Cantillon (1931), Schumpeter (1934), Schultz (1975), and Kirzner (1979), Hébert and Link (1989) define an

entrepreneur as someone who specializes in taking responsibility for and making judgmental decisions that affect the location, form and use of goods, resources, and/or institutions. Successful entrepreneurs exhibit this ability with positive results in a repeated fashion, which is why Wright and colleagues call them "serial entrepreneurs" (Wright, Robbie, & Ennew, 1997). They are seen as symbols of "individualism, drive, and *intuition*" (Ehrlich, 1986, p. 33 emphasis added). Timmons' definition of "entrepreneurship" is pertinent to our discussion of the role that cognition and affect play in entrepreneurial judgment and behavior: "...initiating, doing, achieving and building an enterprise or organization, rather than just watching, analyzing or describing one. It is the *knack* for *sensing* an opportunity where others see chaos, contradiction and confusion" (Timmons, 1989, p. 1, emphasis added).

Alvarez and Busenitz's (2001) definition of entrepreneurial cognition accords with Epstein's (1994) notion of experientiality in CEST. They define entrepreneurial cognition as "the extensive use of individual heuristics" built up from "key experiences and beliefs." In contrast, they consider managerial cognition to be more fact-based, concerned with systematic decision-making and the structural coordination of business activities across different business units (Alvarez & Busenitz, 2001, p. 758).

A fundamental precept of trait-based theories of entrepreneurship is that the prototypical entrepreneur thrives on change, is adventurous, pursues opportunities, generates ideas, is proactive and innovative, and is "of necessity *intuitive* because of the characteristics [i.e., incomplete information, time pressure, ambiguity and uncertainty] of the environment in which they are operating" (Allinson et al., 2000, pp. 32–33 emphasis added). Indeed, the uniqueness of an entrepreneur's business idea or hunch may be such that there are no historical data or clear criteria against which to evaluate its merits, and hence it may be left to intuition to fill in the gaps in knowledge (Goop, Gopalan, & Thakor, 2006). Adaman and Devine (2002, p. 341) included intuition as one aspect of the ability to "sense direction." The other facets were: willingness to undertake risks; identifying and correcting mistakes; experimentation; feeding acquired experiences back into intuition; and mental flexibility (see also Cappon, 1993; Eliasson, 1990).

In order to pursue an opportunity an individual must first of all be able to perceive those opportunities that have potential commercial value, and discriminate between those that are worth pursuing and those that are not. The term "entrepreneurial alertness" was developed by Kirzner (1979) to refer to the "insight" into the value of a given resource which is possessed by

some individuals and not others. According to this view an entrepreneur's alertness is founded not so much upon expert (subject matter) knowledge as on a tacit appreciation of the value of, and opportunities created by, a variety of factors including the environment, new or existing knowledge, technology, new products and/or services (Alvarez & Busenitz, 2001); alertness is considered to encompass both the perception (noticing) and judgment (appraisal) of potential business opportunities and the attendant risks.

Alertness, as expressed in terms of the operation of the intuitive system, pattern recognition, and related somatic processes, has the potential to add to our understanding of entrepreneurial intuition. For example, Baron and Ensley (2006) argue that the identification of new business opportunities is supported by pattern recognition processes "Applying pattern recognition to the identification of business opportunities, it seems possible that specific persons recognize opportunities for new ventures because they perceive connections between apparently independent events and then detect meaningful patterns in these connections" (Baron & Ensley, 2006, p. 1332).

New patterns are to be found in a complex array of factors including advances in technology, changes in markets, shifts in government policy (Baron & Ensley, 2006). An alert entrepreneur is able to perceive a pattern that others overlook and is able to judge (without necessarily being able to articulate any explicit reasoning processes) whether or not the pattern points to a new business opportunity. In contrast with skilful managers, an entrepreneur is able to draw upon and creatively connect memories and patterns from unrelated domains (Sinclair & Ashkanasy, 2002/2003). This enables the formation of novel connections, a likely result of noticing (and acting upon) information on the periphery or outside of commonly accepted framings of the situations encountered (Cappon, 1993; Kahneman, 2003).

One explanation for the notion of entrepreneurial alertness is to be found in the RPD formulation outlined above. Klein's (1998, 2003) notion of pattern recognition is predicated upon the role played by the cognitive frameworks (described by Baron and Ensley as "prototypes") that particular individuals possess, developed through their unique life experiences. As noted by Simon (1947), Dreyfus and Dreyfus (1986), and others, intuition is a manifestation of expertise, and the ability of experts to exercise fast, nonconscious pattern recognition and pattern matching. For example, Simon (1997, p. 134) estimated that chess experts are likely to have internalized around 50,000 familiar patterns gained over 10 years or more of intense practice (Ericsson & Charness, 1994). With increasing

experience an individual's prototypes gain in clarity, richness of content and degree of focus on key attributes of the content domain and context-relevant cues (Baron & Ensley, 2006; Klein, 1998; Zsambok & Klein, 1997).

Pattern recognition accounts well for the ability of an expert to "do what normally works" without explicit awareness of the rules of inference being employed in a given situation (Dreyfus & Dreyfus, 1986) and without thinking consciously about action (Crossan, Lane, & White, 1999). Indeed such automated processing is one of the defining features of "expert intuition." This "automated expertise" corresponds to "recognition of a familiar situation and the straightforward but partially subconscious application of previous learning related to that situation," as described by Miller and Ireland, (2005, p. 21). However, simple pattern recognition is less convincing as an explanation for the creation of novel connections, i.e., connections that characterize entrepreneurial alertness, than as an account of intuition viewed as a form of expertise.

The insights provided by Dutta and Crossan (2005) are helpful in distinguishing further between expert intuition and entrepreneurial intuition. Expert intuition: (a) is based on a process of pattern recognition; (b) parallels the Kirznerian view of alertness which emphasizes the complex knowledge base of the individual; (c) is past pattern-oriented and supports idea exploitation (Crossan et al., 1999). Entrepreneurial intuition, in contrast: (a) relies less on the expert knowledge base of individuals, and more on the creative capacity to recognize gaps and identify possibilities; (b) accords with the Schumpeterian view of entrepreneurs as change agents who "initiate innovation and transformation in the economy on the basis of their intuition about the emerging future" (Dutta & Crossan, 2005, p. 437); (c) is future possibility-oriented and supports idea exploration (Crossan et al., 1999). Moreover, it fosters foresight as a result of the ability to perceive opportunities by quickly drawing on disparate patterns outside of decision makers' usual boundaries (Cappon, 1993). Dutta and Crossan's framework accords importance both to experience and to the "preconscious" cognitive processes that support intuition (Dutta & Crossan, 2005, p. 440). Both expert and entrepreneurial intuitions may be preverbal, for example as a precursor to insight (Dane & Pratt, 2007; Hodgkinson et al., 2008; Sadler-Smith, 2008) or nonverbal, for example as affective judgments for which verbalizations may only be a proxy (Crossan et al., 1999).

An additional aspect of this line of inquiry has been an extension of the resource-based view (RBV) of the firm (Barney, 1991; Penrose, 1959) to include entrepreneurs' cognitions, and specifically the role played by cognitive and affective shortcuts (heuristics). For example, Alvarez and

Busenitz (2001, p. 758) argue that entrepreneurs rely on heuristics in order to make "significant leaps in their thinking" in the face of complex, highly ambiguous, and uncertain situations, thus enabling them to quickly make sense under such circumstances, exploit brief windows of opportunity, and adopt forward-looking approaches (see also Busenitz & Barney, 1997). Hence, intuition, as a facet of entrepreneurial cognition, has the potential to be a source of competitive advantage which is valuable, rare and difficult to imitate (Alvarez & Busenitz, 2001; Barney, 1991).

The incorporation of cognition into the RBV is an important step forward for entrepreneurship research. However one caveat in this connection is that the potentially beneficial insight afforded by viewing entrepreneurs' unique cognitive attributes as a source of competitive advantage is undermined by assuming equivalence between "heuristic processing" and intuition. For example, Alvarez and Busenitz (2001) appear to use the term heuristic processing as a proxy for intuition, thus running the risk of equating intuitions (which we consider to be affectively charged judgments that arise though rapid, nonconscious, and holistic associations – see Dane & Pratt, 2007) with the volitional deployment of cognitive and affective shortcuts that can, on occasion, result in biases (Kahneman, 2003).

However, as Sadler-Smith and Sparrow (2008) noted, although heuristics share some of the features of intuition (they are a fast and cognitively economical response, in terms of conscious processing, to complex problems), they are not equivalent to intitutions. Heuristics, as generally conceived, enable a deliberative, affect-free evaluation of options using minimal conscious cognitive effort (see Gilovich et al., 2002). Intuition on the other hand circumvents this process altogether; there is an absence of awareness of the processes used to arrive at a decision, and it is the affective tag posted directly into conscious awareness that serves as the criterion for choosing from among the available options. Hence, there is a difference between the direct knowing associated with intuition and the (consciously or nonconsciously) deliberative approach associated with the deployment of judgmental heuristics. This debate concerning the delineation of heuristic vs. intuitive processing is especially important given that "intuition" is an oft-used term, albeit at times loosely, both in the academic and practitioner entrepreneurship literatures (Champion & Carr, 2000; Diener, 2006; Ehrlich, 1986).

If one accepts the view that intuitions constitute affectively charged judgments that arise through rapid, nonconscious, and holistic associations (Dane & Pratt, 2007), the over-emphasis placed on cognition in entrepreneurship research has been at the expense of a more detailed analysis of the affective processes which, of necessity, accompany intuitions. The

experientiality-based intuitive system as defined within CEST enables researchers to explain the roles of cognition and affect in entrepreneurial judgment. Moreover, the affective charge (i.e., the emotional tag) that can be inferred from the SMH is one possible means of accounting for the "gut feeling" that accompanies the nonconscious recognition and judgment of complex patterns, i.e., informed intuition grounded in prior learning and experience (Sadler-Smith, 2008).

FUTURE DIRECTIONS

Research into entrepreneurial intuition stands to gain from the insights provided by the RPD, SMH, and dual-process theories (particularly CEST). Nonetheless, in common with other aspects of business and management, entrepreneurship cannot be considered to rely exclusively on intuition or analysis, nor indeed cognition or affect. Rather as Bird (1988) noted, entrepreneurial intentionality is best-served by two interacting and mutually reinforcing sets of processes (cf. Hodgkinson & Clarke, 2007; Louis & Sutton, 1991): (a) rational, analytic, and cause-and-effect related processes structure intention and action and underlie goal setting, formal business planning, resource acquisition, and allocation; (b) intuitive, holistic, and contextual thinking support vision, hunch, an expanded view of untapped resources, and a "feeling of the potential of the enterprise" (Bird, 1988, p. 443).

The study of intuition and of the interplay of the systems that underpin reason and affect in entrepreneurial decision-making are in their infancy; hence, many conceptual, theoretical, and methodological challenges and opportunities present themselves to entrepreneurship researchers. One priority must be the development of better psychometric instruments for the assessment of individual differences in entrepreneurial intuition. Such measures should be commensurate with dual-process conceptions. A number of the currently available instruments are found wanting on reliability and, to some extent, construct validity, grounds (Hodgkinson & Sadler-Smith, 2003a, 2003b; Hodgkinson et al., 2008). Moreover, the assessment of entrepreneurial intuition must go beyond simple self-report measures of the personality predispositions indicated by instruments such as the Myers–Briggs Type Indicator (MBTI). Mitchell et al. (2005, pp. 669–670) argue that researchers need to develop better ways to capture the dynamism between alertness and domain competence, and must also accommodate the investigation of both conscious and unconscious

processes (using, e.g., verbal protocols, cognitive mapping, and conjoint analysis; see also Hodgkinson et al., 2008; Hodgkinson & Sparrow, 2002). However, due to the nonverbal nature of intuition, it is also necessary to augment such methods with procedures less dependent upon verbalization. For example, the use of a visual test that evaluates eye movements and the ability to detect patterns by peripheral scanning (Cappon, 1993) is one alternative, whilst other well-established experimental procedures measure anticipatory SCRs (Bechara et al., 1997).

As well as acknowledging and incorporating the role played by affect into future entrepreneurial cognition research, a number of other vital issues need to be addressed, for example: (a) is entrepreneurial intuition learned or the result of innate dispositions and is it developable; (b) can entrepreneurs adapt their preferred styles of information-processing to accommodate the shifting contingencies that come into play in decision-making in complex, judgmental situations such as those associated with business venturing (cf. Hodgkinson & Clarke, 2007) and in this connection; (c) is it possible to train nascent entrepreneurs in the vital skill of "switching cognitive gears" (Louis & Sutton, 1991); (d) should entrepreneurs search for partnerships to ensure that decision-making within the enterprise has the requisite mix of preferred processing styles for optimal decision-making (cf. Kirton & McCarthy, 1988); (e) to what extent and in what ways does mood influence entrepreneurs' reliance upon intuitive judgment (cf. Baron, 2008; King et al., 2007; Seo & Barrett, 2007); (f) do entrepreneurial intuitions, as argued by Blake (2008), lead to the commercially successful exploitation of ideas for new businesses, products or services, given that successful intuitions tend to be highly visible (i.e., reported and celebrated) whilst unsuccessful intuitions are more invisible?

While the study of intuition, both in general and in the entrepreneurial process, is in its infancy, significant progress has been attained, both in clarifying its nature and in identifying its psychological foundations. Dual-process theories, along with the RPD model and the SMH, have the potential to greatly advance our understanding of the complementary roles played by intuition and its counterpart, analysis, in entrepreneurial judgment, and decision-making. Furthermore, a growing body of theory and research in the field of management, organization, and entrepreneurship has begun to suggest a variety of approaches that might enable present and future generations of entrepreneurs and decision makers more generally to foster greater awareness of these fundamental processes and how the vital entrepreneurial competence of informed intuitive judgment might be harnessed more effectively.

At the end of the day the question of whether or not intuition can be improved is an open one. The more pressing concern is whether or not entrepreneurs can be educated in order that they can understand intuition and thus to manage better their intuitive judgments in an intelligent, i.e., discerning and informed, fashion (see also Burke & Sadler-Smith, 2006; Hodgkinson & Clarke, 2007; Hogarth, 2001; Sadler-Smith & Shefy, 2004). Entrepreneurial intuition, like any other form of intuition, should be informed by prior knowledge, experience and learning, and exercised with sensitivity and awareness and, given the power that affect has to influence human judgment, caution as well.

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