



# Attributions to intuition in the venture founding process: Do entrepreneurs actually use intuition or just say that they do?

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## ABSTRACT

Even though entrepreneurs often cite the use of intuition as a basis for their venturing decisions, verifying that entrepreneurs are actually using intuition is very difficult. We distinguish between entrepreneurs' attributions to intuition and their actual use of intuition. We propose characteristics of entrepreneurs that increase the likelihood that they will attribute intuition as a basis for decisions during the venture founding process. We then delineate characteristics that make the development and effective use of entrepreneurial intuition more likely. Theoretical implications for researchers studying intuition and practical implications for entrepreneurs using intuition are discussed.

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## 1. Executive summary

The decision to found a new venture is typically made based on some combination of formal analysis and an intuitive judgment that justifies the choice. The intuition involved in the decision to found new ventures is the focus of this paper. An intuitive capability can be a powerful and valuable cognitive asset for an entrepreneur to possess because its presence can lead the entrepreneur to defensible judgments when available information is not wholly up to the task. However, a problem with intuition is that one's awareness of whether intuitive processes are, in fact, underlying judgments that are being made is a matter fraught with uncertainty. For example, individuals may be prone to believe that intuition is guiding their decisions when there is little else they can identify to justify their decision preferences.

The fact of the matter is that intuition may or may not be operating at times when decision makers espouse its involvement in their judgments. For founding entrepreneurs (as well as for other individuals making "high stakes" decisions), being able to differentiate between affective responses or 'gut feelings' associated with true intuition and equivalent affective responses associated with other phenomena or stimuli is critical. This is because the development and effective use of entrepreneurial intuition can result in venture founding decisions that may not have been justifiable based solely on formal analysis of available data, but which lead to the establishment of successful enterprises. By contrast, false attributions to intuition by founding entrepreneurs – that is, perceptions that intuition is driving their decisions when some other stimuli are involved – can result in founding choices that are not defensible on any bases and lead to the establishment of enterprises that fail or otherwise under-perform.

In the current article, it is proposed that the strength of an entrepreneur's attributions to intuition as a basis for the venture founding decision is positively related to eight factors: (1) the perceived acceptability of intuition; (2) the perceived success of the entrepreneur's previously founded ventures; (3) the strength of the entrepreneur's entrepreneurial self-efficacy perceptions; (4) the strength of the entrepreneur's overconfidence bias; (5) the strength of the entrepreneur's tolerance for ambiguity; (6) the strength of the entrepreneur's intuitive cognitive style; and, contingent upon the individual's perception that intuition is an acceptable basis for decision making, (7) previous entrepreneurship experience and (8) the amount of domain-relevant

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knowledge (i.e., knowledge pertaining to the specific venturing context in question) possessed by the entrepreneur. The latter two factors are also proposed to be positively related to the development of 'expert entrepreneurial schemas' (EESs) upon which true entrepreneurial intuition is based. Two additional factors proposed as associated with the development of EESs and/or the strength of the relationship between these EESs and the effective use of actual entrepreneurial intuition are the entrepreneur's (1) metacognitive skill level and (2) emotional intelligence level. The last four factors mentioned – i.e., previous entrepreneurship experience, domain-relevant knowledge, metacognitive skill level, and emotional intelligence level – can be thought of as boundary conditions within which true entrepreneurial intuition develops.

Several theoretical and practical implications are suggested. For example, regarding theory, observations in the current paper suggest that entrepreneurship scholars should refrain from inferring a specific role for intuition within the entrepreneurial process based solely on what entrepreneurs might tell them about this matter. Attributions to intuition by entrepreneurs may have little relationship to the actual use of intuition. Regarding practice, would-be entrepreneurs are advised to, for example, seek domain-relevant knowledge and experience whose lessons are likely to be directly applicable to the entrepreneurial opportunity under consideration. Such knowledge and experience are foundational to the formation of the complex knowledge structures or schemas from which all true intuitive capability is derived.

## 2. Introduction

Intuition is argued to be a common influence on human decision making (Epstein, 1990; Isenberg, 1984; Sadler-Smith, 2008). Recognizing the likely pervasiveness with which intuition is used in business settings, Herbert Simon observed that studies of intuition's use in decision making deserve "a high priority in the agenda of management research" (Simon, 1987, p. 61). This same sentiment has been echoed by numerous scholars over the years (e.g., Burke and Miller, 1999). Still, few have taken up the challenge. As a consequence, little is known about the degree to which individuals rely on intuition in their decision making versus simply believing that intuition is informing their decisions (when it is not).

A premise of the current paper is that a theoretical investigation into why entrepreneurs claim to use intuition as a basis for decision making will be useful even if we do not know how much they actually use intuition. In other words, the extent to which entrepreneurs are willing to make attributions to their intuition when starting new businesses is important because it can give us insight into why entrepreneurs take the risks they do. For example, entrepreneurs might rationalize the pursuit of inherently speculative entrepreneurial opportunities based on their beliefs that intuition is affecting their decisions. Therefore, our first purpose is to identify the characteristics and experiences of entrepreneurs that increase the likelihood that intuition will be identified as a driver of their venture founding decisions.

A second purpose of our paper is to identify individual characteristics and experiences that, when they exist, create more confidence that *actual* intuition will be developed and effectively utilized by entrepreneurs. Even if it is difficult to measure the actual use of intuition throughout the venture founding process, we can still examine the boundary conditions within which intuition develops and that, if present, foster confidence that intuition is actually being used as a basis for decision making. Drawing on intuition research and scholarship, we develop propositions regarding when entrepreneurs would be more likely to use actual intuition in the venture founding process.

We conclude by detailing the theoretical and practical implications of the possibility that significant discrepancies exist between how intuition is thought to affect the entrepreneurial process – the venture founding decision, in particular – and the actual role of intuition in this process.

### 2.1. Defining intuition

Despite the fact that intuition has been defined in many ways (Burke and Miller, 1999; Behling and Eckel, 1991), consensus is now emerging among researchers that intuition (1) originates beyond conscious thought, (2) includes holistic associations, and (3) results in affectively charged judgments (Dane and Pratt, 2007; Hodgkinson et al., 2008; Sadler-Smith and Shefy, 2007; Sinclair and Ashkanasy, 2005). Sinclair and Ashkanasy (2005, p. 357) define intuition as "a non-sequential information processing mode, which comprises both cognitive and affective elements and results in direct knowing without any use of conscious reasoning." Intuitions are defined similarly by Dane and Pratt (2007) as "affectively charged judgments that arise through rapid, nonconscious, and holistic associations." Recent work by Sadler-Smith and his colleagues adopt Dane and Pratt's definition of intuition (Hodgkinson et al., 2008; Sadler-Smith and Shefy, 2007). We follow the emerging consensus in the literature and adopt Dane and Pratt's (2007) definition of intuition.

Past research on intuition has suggested that the use of intuition may vary as a function of the nature of the problem to be solved (Dane and Pratt, 2007; Simon, 1987). According to Agor (1990), the specific conditions under which the use of intuition is appropriate are when: (a) there is a high level of uncertainty in the environment; (b) there is little previous precedent for action in the face of new emerging trends; (c) there are limited or no facts; and (d) there are several plausible alternative solutions to choose from with good factual support for each option. Several of these conditions are common to the entrepreneurial context of new venture creation and to entrepreneurial problems in general (Allinson et al., 2000; Lichtenstein et al., 2006). As such, the entrepreneurship domain is a logical arena in which to look for evidence of intuition. Not surprisingly, entrepreneurial intuition – that is, intuition involving entrepreneurial process-related matters – is commonly purported to have a significant impact on venture founding decisions (Allinson et al., 2000; Mitchell, Friga, and Mitchell, 2005).

## 2.2. Measuring intuition

Many studies within the domain of intuition research (e.g., Burke and Miller, 1999; Khatri and Ng, 2000; Parikh et al., 1994) have simply asked individuals whether and/or under what conditions they used intuition. As such, the construct being measured through surveys or interviews in many “intuition” studies is *attributions to intuition*, since the extent to which individuals are willing to attribute their decisions to intuition is the true focus of the research. Another way researchers have studied intuition (without measuring the actual phenomenon) is to focus on individual preferences for intuitive thinking. For example, a stream of research in the psychology literature by Epstein and his colleagues (Epstein et al., 1996; Pacini and Epstein, 1999) examines preferences for using intuitive-experiential versus analytical-rational thinking styles. Allinson and Hayes' (1996) cognitive style index – used to measure intuitive versus analytic cognitive style – is another popular measure of individuals' preference for intuitive thinking.

The studies that have examined individuals' actual use of intuition have employed carefully controlled experimental designs, as in Simon's (1987) study of intuition among chess grandmasters, or have been conducted in field settings where experienced experts repeatedly make decisions with immediate outcomes, such as Klein's (2003) research on highly experienced firefighter-commanders. Such designs or settings would be challenging to create in regard to examining entrepreneurs' intuition in the decisions made during the venture founding process. Not surprisingly, the actual impact of intuition on any particular nascent entrepreneur's decision to found a venture is a matter about which there has been a paucity of empirical research. Because of the difficulties associated with measuring intuition (Simon, 1987; Sinclair and Ashkanasy, 2005) throughout the venture founding process, examinations of the actual use of intuition among entrepreneurs will likely remain rare within the realm of entrepreneurship research. Nonetheless, as discussed below, there are predictable reasons why entrepreneurs may attribute their venture founding decisions to intuition, and such attributions are worthy of study regardless of whether actual intuition is influencing entrepreneurs' decisions.

## 3. Predicting attributions to intuition among entrepreneurs

When asked to indicate whether intuition has affected their decisions at various times or to varying degrees, research suggests that most individuals will answer in the affirmative (Burke and Miller, 1999). This is an interesting finding to contemplate inasmuch as, if intuition is appropriately conceived of as a subconscious reasoning process, how can one consciously ‘know’ that intuition was involved as a decision driver? A predictable response to this intractable question might be that we ‘know’ intuition was involved in a decision because of our ‘gut feeling’ about that decision. Such a response suggests two problematic issues involving research and conventional insight into the phenomenon of intuition.

First, whether individuals can be expected to confidently know when the subconscious reasoning process of intuition has been used as a basis for decisions made is a very questionable matter (Sadler-Smith, 2008). After all, this is a subconscious process and, as such, our awareness of any decision guidance resulting from intuition may be tentative at best (Dreyfus, 2004; Lieberman, 2000). How individuals feel about decisions may represent an affective response to the conclusions of subconscious reasoning processes that are, in fact, intuition based. However, how individuals feel about decisions may also be influenced by conscious knowledge of various explicit decision considerations. Sorting between these possibilities will not always, if ever, be easily accomplished. In short, there is much room for interpretational error when inferring the presence of intuition as a decision driver.

Second, it is impossible for an outside party to a decision to definitively refute the presence of intuition as a decision driver (Lieberman, 2000). Who, after all, can prove that intuition was *not* involved in making a decision? Thus, an ‘infalsifiability’ issue exists with respect to intuition. Those who claim to have relied on intuition as a basis for decision making cannot be proven wrong. Moreover, claims of having used intuitive judgment can be very convenient for the decision maker – not necessarily convenient in an insincere or misleading sense, but convenient nonetheless. This is because whether or not an individual believes that intuition influenced a decision, he/she will seldom, if ever, be asked to justify that intuition. This is not to suggest that skeptics to an intuitive decision will never ask for ‘harder’ evidence that might corroborate the decision. However, we suspect that asking someone to justify his or her intuitive feeling *per se* about a decision is something that is seldom done.

The preceding issues suggest that the perceived use of intuition as a basis for decisions may not represent intuition's actual use. Thus, one cannot confidently and accurately measure the use of intuition simply by asking individuals about it (Dreyfus, 2004; Sinclair and Ashkanasy, 2005). If individuals have, at worst, no awareness or, at best, a biased awareness of the extent to which intuition is driving a decision choice, simply asking individuals to reflect and report on their reliance on intuition (in general or in reference to specific decisions) is bound to result in questionable data. Therefore, individuals' attributions to intuition may have little relationship to the actual phenomenon of intuition.

Of particular relevance to this paper is the matter of why entrepreneurs might indicate that intuition was involved in their venture founding decisions. Consistent with some of the preceding discussion, there are several plausible reasons, including the possibility that entrepreneurs will purport to have relied on intuition as a basis for the venture founding decision when they are uncertain as to whether this was the case. It is plausible that entrepreneurs will often simply not be able to consciously identify any more verifiable, obvious, or compelling basis for having proceeded with the venture founding. Therefore, they attribute their decision to intuition. In other words, attributions to intuition could become a default option when other possible decision drivers may not seem, in the mind of the entrepreneur, to cumulatively justify the founding decision. In addition, entrepreneurs might occasionally knowingly misattribute their venture founding decisions to intuition. This could occur, for example, if the entrepreneur believes an intuition-based justification is more acceptable as an espoused driver of the decision than other

recognized influences on the decision. As a case in point, an attribution to intuition may be regarded as a more defensible basis for a venture's founding than reliance on market-related data that are old, incomplete, or of questionable validity.

Differences in entrepreneurs' past experiences and individual characteristics will make them variously likely to attribute their venture founding decisions to intuition. Propositions regarding entrepreneurs' attributions to intuition are presented below. Subsequently, we identify experiences and characteristics of entrepreneurs that should enable them to develop and effectively use actual intuition. Fig. 1 offers an overview of these propositions.

3.1. Perceived acceptability of intuition

Research on intuition has demonstrated that while some have encouraged the use of intuition (e.g., Harper, 1988; Metzemaekers, 2000; Rowan, 1989), others have cautioned against its use in decision making (e.g., Bonabeau, 2003; Cross and Brodt, 2001; Schoemaker and Russo, 1993). Miller and Ireland (2005) point out that intuition's presence can be portrayed as intrinsically appealing, such as when it is associated with the heroic gambler or the well-traveled expert. On the other hand, many people are inherently suspicious of intuition. Hogarth (2001, p. preface x) states "I have misgivings when people explicitly appeal to intuition. What does it really mean? Do people really have 'special knowledge,' or is the whole notion just a smoke screen?"

If we ask entrepreneurs about their use of intuition, we should recognize that some entrepreneurs will view the use of intuition more positively than others. Individuals will differ in how acceptable they view the use of intuition depending on their viewpoints

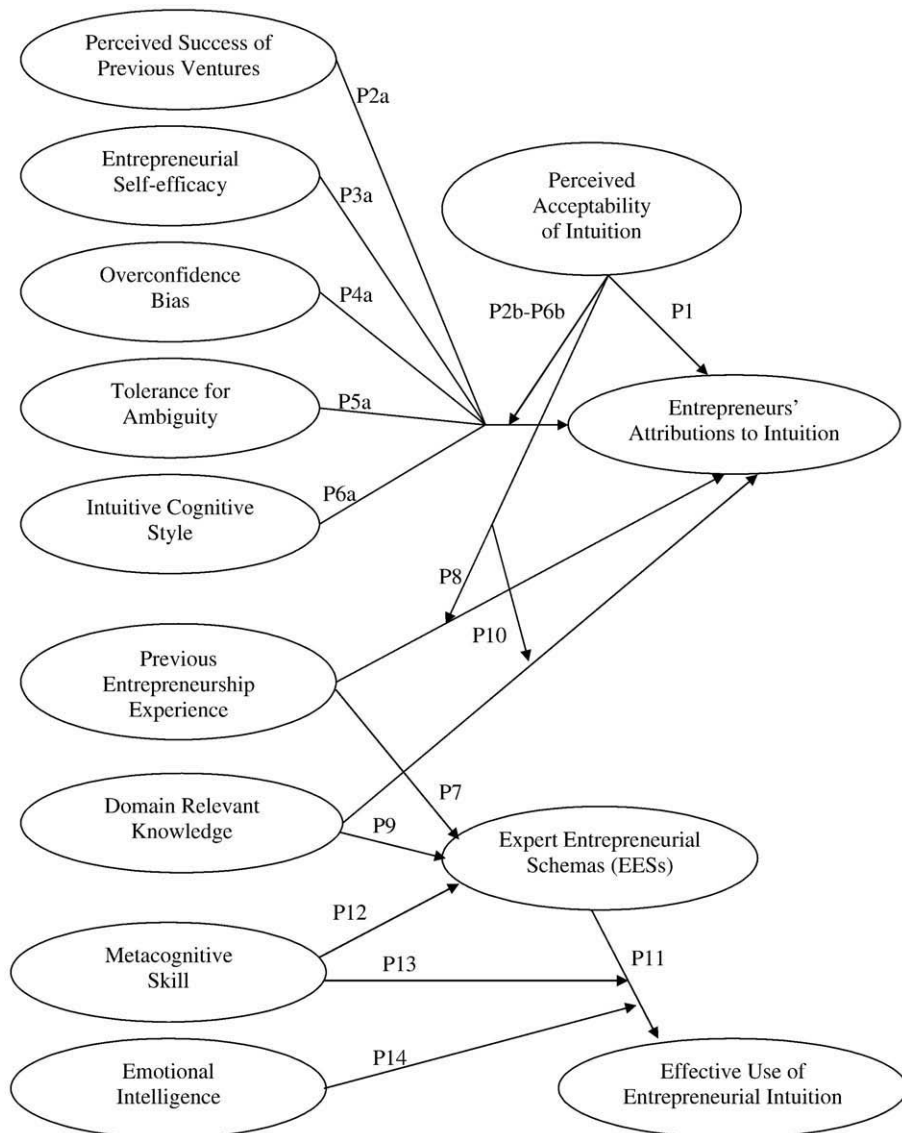


Fig. 1. Predictors of entrepreneurs' attributions to intuition and the effective use of entrepreneurial intuition.

and past experiences when intuition was thought to be involved in their decision making. The perceived acceptability of using intuition can be defined as the degree to which someone accepts intuition as a legitimate basis for making decisions. Thus, perceived acceptability of intuition is an indication of how favorably someone views the use of intuition during decision making.

The perceived acceptability of intuition could be context-dependent. For example, in certain situations – such as when presenting a business plan to a venture capitalist – the prevailing social desirability bias may favor attributions to rational, conscious, and explicit analysis as the basis for a venture founding decision. In such a ‘formal’ context, it may be less likely that an entrepreneur would make attributions to their intuition. However, even within this context, we expect that there would be differences in entrepreneurs’ perceived acceptability of using intuition. In general (or across multiple contexts), we would expect that whether an entrepreneur views the use of intuition favorably – i.e., as acceptable – will influence his or her willingness to make attributions to intuition.

**Proposition 1.** *The strength of an entrepreneur’s perceived acceptability of intuition is positively related to the strength of that entrepreneur’s attributions to intuition as a basis for venture founding decisions.*

In addition to having a direct effect on an entrepreneur’s attributions to intuition, for each proposition that identifies attributions to intuition as the dependent variable (i.e., Propositions 2a, 3a, 4a, 5a, 6a, 8, and 10), we propose that an entrepreneur’s perceived acceptability of using intuition will moderate the relationship in question.

### 3.2. Success of previously founded ventures

In contrast to intuition, formal decision approaches that rely on explicitly structured processes, objective data, and quantitative analyses have long been advocated as bases for business decision making (Sadler-Smith and Shefy, 2004). Data limitations surrounding entrepreneurial opportunities typically require that judgments be exercised as a complement to any formal decision analyses conducted in evaluation of those opportunities. Sometimes, intuition can wholly substitute for formal analysis. Significantly, if entrepreneurs are not completely deferring to the results of formal opportunity analyses they may have conducted (i.e., relinquishing their judgment to the decision techniques) they will be exercising their personal judgment, which can be based on their intuition. Through classical conditioning effects, if entrepreneurs perceive they have relied on intuition in founding ventures they regard as successful, future reliance on intuition will be encouraged as a basis for venture founding decisions. This is because entrepreneurs’ will believe that their intuition has served them well in the past, so the perceived need for other evidence in support of a future founding decision will be diminished (Hogarth, 2001). Moreover, consistent with attribution theory (Kelley and Michela, 1980), individuals tend to attribute positive outcomes to themselves. For example, if entrepreneurs attribute their intuition as the primary basis for founding a new venture, then entrepreneurs can implicitly credit themselves with their ventures’ success.

Despite the fact that success may encourage one’s willingness to look no further than their perceived intuition as a basis for decision making, there is nothing inherent to success that would necessarily develop one’s intuition (Hogarth, 2001). Hogarth points out that the learning structure (i.e., characteristics of the environment in which people learn) is important to determining whether a person will acquire valid intuitions from previous success. Other evidence suggests that failure is often a better teacher than success (Maidique and Zirger, 1985; Miller, 1992). This is important because intuition is rooted in what we learn from our experiences (Dreyfus and Dreyfus, 1986; Simon, 1987). Failure often prompts a critical examination of decision-influencing assumptions and beliefs, and we learn from this questioning and reconsideration of knowledge (Cyert and March, 1963; Sitkin, 1992). By contrast, success reinforces our belief that we harbor accurate understandings, so we become less receptive to new knowledge and to that which might substitute for what we hold as true (Baumard and Starbuck, 2005). Therefore, prior success might lead to greater self-assuredness that entrepreneurs will believe they know viable entrepreneurial opportunities when they see them (Cooper, Folta, and Woo, 1995).

**Proposition 2a.** *The perceived success of an entrepreneur’s previously founded ventures is positively related to the strength of that entrepreneur’s attributions to intuition as a basis for venture founding decisions.*

**Proposition 2b.** *An entrepreneur’s perceived acceptability of intuition will moderate the relationship between the perceived success of an entrepreneur’s previously founded ventures and attributions to intuition, such that the relationship will be more positive when the use of intuition is viewed as acceptable.*

### 3.3. Entrepreneurial self-efficacy perceptions

Entrepreneurial 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” (Chen, Greene, and Crick, 1998, p. 295). This belief has often been identified as a predictor of the likelihood that individuals will start new businesses (e.g., Boyd and Vozikis, 1994; Markman et al., 2002). It seems quite plausible that those who attribute their venture founding initiatives to intuitive judgments may be doing so simply because they believe, based on strong entrepreneurial self-efficacy perceptions, they have the skills and abilities to be successful entrepreneurs (Krueger and Dickson, 1994). A belief in one’s entrepreneurial skills and abilities could diminish the felt need of nascent entrepreneurs to rely on formal decision approaches when considering the possibility of starting a business. If a person ‘knows’ that he or she has what it takes to be a successful entrepreneur, evidence that could help assess or confirm the advisability

of a venture's establishment may never be sought. Instead, the venture founding decision could be easily justified on the basis of the entrepreneur's intuition about the matter. This is not to suggest that entrepreneurial self-efficacy and intuition cannot have independent effects on the venture founding decision. However, the preceding points do raise the possibility that the process of intuition may be perceived as operating when, in fact, the phenomenon driving the founding decision is simply entrepreneurial self-efficacy.

**Proposition 3a.** *The strength of an entrepreneur's entrepreneurial self-efficacy perception is positively related to the strength of that entrepreneur's attributions to intuition as a basis for venture founding decisions.*

**Proposition 3b.** *An entrepreneur's perceived acceptability of intuition will moderate the relationship between an entrepreneur's entrepreneurial self-efficacy perception and attributions to intuition, such that the relationship will be more positive when the use of intuition is viewed as acceptable.*

### 3.4. Overconfidence bias

Overconfidence exists when individuals overestimate the probability of being correct. Considerable evidence suggests that entrepreneurs commonly tend to exhibit an overconfidence bias (Cooper et al., 1995; Busenitz and Barney, 1997). That is, they tend to assess the probability that their businesses will be successful at a much higher level than objective data would suggest is reasonable. When an overconfidence bias exists, nascent entrepreneurs may believe they are acting on their intuition when deciding to pursue an entrepreneurial opportunity. Such beliefs may exist regardless of whether actual intuition is, in fact, operating.

Overconfidence may be erroneously interpreted as entrepreneurial intuition for at least two reasons. First, as with individuals exhibiting high entrepreneurial self-efficacy, overly confident people may not feel a strong need to engage in formal analysis as a means for arriving at or substantiating their venture founding decisions. Specifically, they do not 'need' empirical data to tell them they are correct in their evaluations of entrepreneurial opportunities. Attributions to intuition would likely be commonplace in the presence of such a data void. Second, overly confident people may tend to discount or ignore evidence suggesting that their confidence is unjustified. Thus, it is not simply that overconfidence will lead to a failure to seek data that might be used to justify the venture founding. Overconfidence may also lead to the rejection of known data that are not supportive of the venturing effort. Entrepreneurial intuition might be offered as a seemingly 'rational' explanation for starting a business when data suggest that expectations of success are unrealistic.

**Proposition 4a.** *The strength of an entrepreneur's overconfidence bias is positively related to the strength of that entrepreneur's attributions to intuition as a basis for venture founding decisions.*

**Proposition 4b.** *An entrepreneur's perceived acceptability of intuition will moderate the relationship between an entrepreneur's overconfidence bias and attributions to intuition, such that the relationship will be more positive when the use of intuition is viewed as acceptable.*

### 3.5. Tolerance for ambiguity

An ambiguous situation is one that cannot be adequately structured or categorized by an individual because of the lack of sufficient cues. Ambiguity exists in situations where the information available does not allow the inference of clear, unequivocal meanings and conclusions. Most significantly, ambiguity is common to the fast-paced decision-making contexts that invite intuitive decision making. As observed by Miller and Ireland (2005, p. 19), "The need for quick decisions, the need to cope with demands created by complex market forces, and the assumed benefits of applying deeply held knowledge combine to create strong perceived value for the intuitive approach." Not surprisingly, ambiguity is a situational quality often associated with the founding of ventures (e.g., Morris and Zahra, 2000), and entrepreneurs are depicted as having a characteristically high tolerance for ambiguity (e.g., Bygrave, 1989). A high tolerance for ambiguity would enable nascent entrepreneurs to cope with the uncertain and complex task of venture founding without experiencing great anxiety and emotional upset. Arguing that "entrepreneurs eagerly undertake the unknown and willingly seek out and manage uncertainty," Koh (1996, p. 15) reported a strong, positive relationship between measures of ambiguity tolerance and an individual's "entrepreneurial inclination."

Those entrepreneurs who do exhibit a high tolerance for ambiguity may also report a strong reliance on intuition as the basis for their venture founding decisions. In fact, what is perceived as superior entrepreneurial intuition by nascent entrepreneurs may be nothing more than those individuals' tolerance for ambiguity. This latter phenomenon could pass as intuition, for example, if individuals attribute their ability to function comfortably in ambiguous venture founding situations to their intuitive understanding of entrepreneurial dynamics and success factors. Moreover, nascent entrepreneurs with a high tolerance for ambiguity may be less likely to engage in information search strategies designed to reduce or otherwise manage the uncertainty associated with the founding decision (Specht, 1987). In the absence of consciously collected data that suggest the viability of a venturing initiative, entrepreneurs may resort to attributions to intuition as justification for their venturing efforts.

**Proposition 5a.** *The strength of an entrepreneur's tolerance for ambiguity is positively related to the strength of that entrepreneur's attributions to intuition as a basis for venture founding decisions.*

**Proposition 5b.** *An entrepreneur's perceived acceptability of intuition will moderate the relationship between an entrepreneur's tolerance for ambiguity and attributions to intuition, such that the relationship will be more positive when the use of intuition is viewed as acceptable.*

### 3.6. Intuitive cognitive style

Cognitive styles have been described as the “heuristics an individual uses to process information about his or her environment” (Kozhevnikov, 2007, p. 477). Although many different cognitive style dimensions have been proposed over the years (see Kozhevnikov (2007) for a recent review of the cognitive style literature), the cognitive style dimension with the greatest relevance to the concept of entrepreneurial intuition is the analytical-intuitive dimension, most commonly associated with the research of Allinson and Hayes (1996). According to Allinson and Hayes' (1996, p. 122) conceptualization of this dimension, analysis refers to “judgment based on mental reasoning and a focus on detail” and intuition refers to “immediate judgment based on feeling and the adoption of a global perspective.” Allinson and Hayes (1996) posit that analysis and intuition exist as the polar ends of a single dimension. Other scholars dispute this premise. For example, Epstein et al. (1996) argue that analytic and intuitive processing is performed by independent cognitive systems – a rational system (associated with analytic processing) and an experiential system (associated with intuitive processing). As such, it has been suggested that analysis and intuition are most appropriately assessed using separate unipolar scales (e.g., Hodgkinson and Sadler-Smith, 2003).

Regardless of whether a preference for intuitive processing is conceptualized as occurring at the expense of analytic processing (à la Allinson and Hayes, 1996) or as an independent (from analysis) dimension and manifestation of cognitive style (à la Hodgkinson and Sadler-Smith, 2003), empirical evidence within the entrepreneurship research domain has documented the prevalence and relevance of intuitive cognitive styles among entrepreneurs. For example, using the Cognitive Style Index (CSI) instrument developed by Allinson and Hayes (1996), Krueger and Kickul (2006) reported in their study of university students that the perceived desirability of starting a businesses is more positively associated with the intent to start a business among students with intuitive versus analytic cognitive styles. Dutta and Thornhill (2008) reported in their qualitative study of 30 entrepreneurs that those with a more intuitive style (which Dutta and Thornhill labeled a ‘holistic’ style) are more apt than those with analytic styles to revise their growth intentions in response to changes in the perceived hostility levels of their firms' environments. Of greatest relevance to the focus of the current paper, based on data collected with Allinson and Hayes' (1996) Cognitive Style Index, Allinson et al. (2000) reported that the styles of successful entrepreneurs were significantly more intuitive than those of the non-owner managers in their sample. Considering the espoused preference for intuitive thinking among entrepreneurs, as revealed in the Allinson et al. (2000) research, we expect that entrepreneurs who prefer to process information intuitively will also be more likely to believe that intuition is an important basis for their venture founding decisions.

**Proposition 6a.** *The strength of an entrepreneur's intuitive cognitive style is positively related to the strength of that entrepreneur's attributions to intuition as a basis for venture founding decisions.*

**Proposition 6b.** *An entrepreneur's perceived acceptability of intuition will moderate the relationship between an entrepreneur's intuitive cognitive style and attributions to intuition, such that the relationship will be more positive when the use of intuition is viewed as acceptable.*

## 4. Predicting the development of expert entrepreneurial scripts and the effective use of entrepreneurial intuition

Up to this point, we have examined those characteristics of entrepreneurs that would make them more likely to attribute their venture founding decisions to intuition. Now, we move to identifying the characteristics that, when they exist, facilitate entrepreneurs' development of ‘expert entrepreneurial schemas’ (or EESs) which ultimately enable the effective use of intuition. Schemas are “dynamic, evolving mental models that represent an individual's knowledge and beliefs about how physical and social worlds work” (Gaglio and Katz, 2001, p. 97). Dane and Pratt (2007) suggest that expert schemas are both highly complex and domain relevant. We define EESs as complex schemas that contain knowledge relevant to the entrepreneurial domain (e.g., knowledge pertaining to the venture founding context or process). EESs are similar to expert cognitive maps (Simon, 1996) and expert knowledge structures or expert decision scripts (Klein, 2003; Mitchell et al., 2005; Mitchell et al., 2002; Mitchell et al., 2000; Neisser, 1976; Simon, 1987). We now discuss two important antecedents of EESs.

### 4.1. Previous entrepreneurship experience

If it is true that “intuition can be developed most rapidly through repeated exposure to the complexity of real problems” (Khatri and Ng, 2000, p. 78), then entrepreneurs who have founded numerous ventures or who have experience growing new ventures will develop more EESs than will novice entrepreneurs. This is consistent with what has been referred to as the automated expertise perspective on intuition (Miller and Ireland, 2005; Prietula and Simon, 1989; Simon, 1987). Specifically, familiarity with certain situations can enable individuals to ‘automatically’ grasp the relevant issues and recognize meaningful signs or patterns that have information value. The key word here is familiarity. Individuals must have experienced certain events in the past and have learned from them for intuition to have developed.

Research suggests that a ten year period of intense preparation may be necessary for achieving the highest levels of expertise in the domains of chess and music (Ericsson and Charness, 1994; Ericsson et al., 1993; Simon and Chase, 1973). Ericsson and Charness (1994) also suggest that winning international competitions in the domains of sports, arts, and science appears to require at least 10 years of preparation, and typically substantially longer. Although we are not suggesting that entrepreneurs need to reach the highest levels of expertise to effectively utilize intuition, this prior research does support the notion that past experience in founding ventures is a prerequisite for developing EESs. Within the entrepreneurship domain, Baron and Ensley (2006) compared the 'business opportunity prototypes' (i.e., the cognitive representations of the essential nature of opportunities) of first-time and repeat entrepreneurs. They found that 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) than the prototypes of novice entrepreneurs. Thus, EESs pertaining to venture founding will likely be a function of the entrepreneur's degree of familiarity with such decisions. Degree of familiarity, in turn, will be impacted by previous entrepreneurship experience.

**Proposition 7.** *Previous entrepreneurship experience is positively related to that entrepreneur's development of expert entrepreneurial schemas.*

Moreover, it is plausible that previous entrepreneurship experience may not have a strong general or main effect on entrepreneurs' attributions to intuition, but that the direction of the relationship between previous entrepreneurship experience and entrepreneurs' attributions to intuition will be positive if entrepreneurs regard intuition as an acceptable basis for decision making and negative if entrepreneurs are biased against declarations of intuition's use. In particular, among entrepreneurs with favorable views of intuition, the existence of significant prior venturing experience may result in perceptions that they have 'earned the right' to attribute their venture founding decisions to intuition (Krueger, 1993). On the other hand, among entrepreneurs with unfavorable views of intuition, the existence of significant prior venturing experience may result in an aversion to attributing their venture founding decisions to intuition because a better, more substantive-seeming basis for decision making – that is, conscious knowledge of prior entrepreneurship experiences – will be identifiable.

**Proposition 8.** *An entrepreneur's perceived acceptability of intuition will moderate the relationship between previous entrepreneurship experience and attributions to intuition, such that the relationship will be positive when the use of intuition is viewed as acceptable and negative when the use of intuition is viewed as unacceptable.*

#### 4.2. Domain-relevant knowledge

While the existence of previous entrepreneurship experience can enable the development of ESSs (and, possibly, influence attributions to intuition), such experience may be limited to facilitating the development of entrepreneurial 'process' schemas if the ventures founded are in different 'content' domains – e.g., different product-market or technological domains. The knowledge that is idiosyncratic to operating in a specific type of business – that is, domain-relevant knowledge – is also an important antecedent of EESs. As previously argued, intuition develops through past experiences. While learning theories can be sorted into behavioral, cognitive, and situative categories (see Greene et al., 1996), learning theories focused on cognitive processes (e.g., Argyris and Schon, 1978; Herriott et al., 1985; Torbert, 1973) most directly recognize that repeated exposure to similar situations enables individuals to attach greater meaning and information value to their experiences. Within the realm of entrepreneurship, the linkage between experience and learning is commonly acknowledged in regard to the opportunity recognition process (Lumpkin and Lichtenstein, 2005; Shane, 2000). That is, prior knowledge from similar experiences gives greater saliency to external cues that may trigger the opportunity recognition process. Moreover, relevant previous experience has been shown to influence the success of ventures subsequently founded in those same domain spaces (Reuber and Fischer, 1999; van Praag, 2003). Domain-relevant knowledge can include, for example, experience working in the same industries or markets as the venture under consideration (Cooper et al., 1994; Song et al., 2008). In contrast, an entrepreneur who starts a restaurant (and, accordingly, has some level of domain-relevant knowledge in the restaurant industry) may not have any domain-relevant knowledge pertinent to starting-up a construction company or medical practice. As argued by Dijksterhuis and Nordgren (2006), the more domain-relevant the knowledge possessed by an entrepreneur, the better and more complete the input will be for the entrepreneur's subconscious mind to process. Significantly, the presence of domain-relevant knowledge is argued by Dane and Pratt (2007) to be foundational to the development of complex schemas.

**Proposition 9.** *The level of domain-relevant knowledge possessed by an entrepreneur is positively related to that entrepreneur's development of expert entrepreneurial schemas.*

In addition, as entrepreneurs learn from their exposure to entrepreneurial experiences within similar content domains (e.g., similar product-market or technological domains), they may be comfortable generalizing from past experiences and, possibly, attributing their venture founding decisions to both recognized knowledge and intuition pertaining to the venturing context in question. Thus, relevant past experience creates domain-relevant knowledge entrepreneurs can reference in justifying their attributions to intuition. Nonetheless, as with our prior observations regarding the likelihood that perceived acceptability of intuition will be a moderator of the relationship between previous entrepreneurship experience and attributions to intuition, the level of domain-relevant knowledge possessed by an entrepreneur may only have a positive effect on attributions to intuition if intuition is favorably perceived; otherwise, the effect will be negative.



**Proposition 10.** *An entrepreneur's perceived acceptability of intuition will moderate the relationship between the level of domain-relevant knowledge possessed by an entrepreneur and attributions to intuition, such that the relationship will be positive when the use of intuition is viewed as acceptable and negative when the use of intuition is viewed as unacceptable.*

#### 4.3. Effective use of entrepreneurial intuition

Dane and Pratt (2007) suggest that a primary way to determine whether or not intuition will be effective is to examine the nature of the schemas a person employs when intuiting. A growing body of research suggests that 'experts' (or those individuals with expert schemas) can make highly accurate intuitive decisions (Benner and Tanner, 1987; Dreyfus and Dreyfus, 1986, 2005; Klein, 1998, 2003; Prietula and Simon, 1989; Simon, 1987, 1996). Experts possess sophisticated cognitive structures that permit rapid and accurate responses when making decisions in demanding situations (Dane and Pratt, 2007). Consistent with this evidence, the presence of EESs is expected to enable entrepreneurs to effectively use intuition. Indeed, past research in the entrepreneurship domain supports this notion. EESs are similar to Krueger's construct of 'expert entrepreneurial mindsets.' Krueger (2007, pp. 124–125) argues that "As individuals move from a more novice entrepreneurial mind-set toward a more expert mind-set, that movement is reflected in significant changes in deep cognitive structures, punctuated by critical developmental experiences." Krueger (2007) proposes that the deep beliefs underlying expert entrepreneurial mindsets are the foundation of entrepreneurial action. In addition, entrepreneurs with more developed EESs would likely have a higher proficiency at dot-connecting or pattern recognition (Baron, 2006; Baron and Ensley, 2006; Klein, 1998; 2003). The pattern-matching process is based upon expert schemas associated with an individual's accumulated expertise in real-world contexts (Klein, 2003). Baron (2006) suggests that entrepreneurs use cognitive frameworks acquired through experience to perceive connections between seemingly unrelated events or trends in the external world. Entrepreneurs are then able to use the patterns they perceive to identify and develop ideas for new products or services.

The possession of EESs may also be related to entrepreneurs' ability to utilize effectual reasoning when creating new ventures (Sarasvathy, 2001a,b, 2008). Effectuation is a distinct mode of reasoning guided by the logic that "to the extent that we can control the future, we do not need to predict it" (Sarasvathy, 2001a, p. 252). Sarasvathy (2001b, 2008) studied 27 expert entrepreneurs that had founded one or more companies; remained a full-time founder/entrepreneur for 10 years or more; and participated in taking at least one company public. A quantitative analysis of these entrepreneurs' decision-making protocols revealed that the vast majority relied on effectuation processes when making decisions under uncertainty. As discussed by Sarasvathy (2001a, p.245), "effectuation processes take a set of means as given and focus on selecting between possible effects that can be created with that set of means." Significantly, "the development of entrepreneurial expertise [as would be reflected in the emergence of EESs] is nurtured through effectual reasoning, and effectual action becomes a primary tool of expertise" (Read and Sarasvathy, 2005, p. 58). Most importantly, the presence of expertise facilitates the integration and synthesis of knowledge (Boshuizen and Schmidt, 1992) which forms the cognitive basis for the effective use of intuition (Chase and Ericsson, 1981). In short, entrepreneurs' reliance on intuition may be closely tied to the use of effectual reasoning, with both cognitive processes linked to the presence of EESs.

**Proposition 11.** *The possession of expert entrepreneurial schemas by an entrepreneur is positively related to the effective use of entrepreneurial intuition in venture founding decisions.*

#### 4.4. Metacognitive skill

At a very basic level, metacognition is the process of thinking about thinking. Flavell (1976, p. 232) describes the concept as follows: "Metacognition refers to one's knowledge concerning one's own cognitive processes or anything related to them." Metacognition involves a self-regulatory mechanism that helps people guide their own performance in complex domains (see Cohen, Freeman, and Wolf, 1996). It involves the conscious process of assessing and adjusting one's progress and strategy in problem solving (Cannon-Bowers et al., 1998). Metacognition is generally regarded as consisting of two primary functions: monitoring and control (e.g., Metcalfe and Shimamura, 1994; Schmidt and Ford, 2003). Monitoring includes such processes as identifying the task, checking and evaluating one's progress, and predicting the outcomes of that progress. Control processes include decisions such as where to allocate one's resources, the specific steps to be used to complete the task, the speed and intensity at which to work on the task, and the prioritization of activities.

Of particular note, metacognitive skills may aid in the development and effective use of intuition. Individuals with greater metacognitive skill learn more effectively because they monitor their progress, determine when they are having problems, and adjust their learning accordingly (Ford et al., 1998). Dane and Pratt (2007) argue that explicit learning ("when individuals are consciously aware that changes are accruing to their underlying knowledge bases" [p. 43]) and implicit learning ("the process by which one acquires – outside of one's conscious awareness – knowledge about the structure or pattern underlying a complex stimulus environment" [p. 44]) are both important processes in the formation of the EESs which influence the effectiveness of intuitive decision making. As such, how one learns and, more importantly, the control one can exercise over the learning process via the exhibition of metacognitive skills could influence an entrepreneur's effective use of intuition.

Moreover, the metacognitive ability to reflect on one's thinking and evaluate thought processes should also assist individuals in determining when to base decisions primarily on their EESs versus when to gather more information as input to formal, explicit analysis. Thus, rather than simply accepting an affectively charged judgment as the best way to proceed, entrepreneurs with metacognitive skill may be more likely to use multiple analytical strategies to verify their intuition, as well as to effectively

alternate between using intuitive and rational decision processes as the perceived need arises. In short, metacognitive skills may contribute directly to the development of EESs as well as moderate the relationship between these schemas and the effective use of entrepreneurial intuition.

**Proposition 12.** *The level of metacognitive skill possessed by an entrepreneur is positively related to that entrepreneur's development of expert entrepreneurial schemas.*

**Proposition 13.** *Metacognitive skill will moderate the relationship between an entrepreneur's possession of expert entrepreneurial schemas and the effective use of entrepreneurial intuition, such that the relationship will be more positive when the entrepreneur possesses greater levels of metacognitive skill.*

#### 4.5. Emotional intelligence (EI)

Mayer and Salovey (1997) have defined emotional intelligence (EI) as the capacity to reason about emotions, and of emotions to enhance thinking. Although there is ongoing debate regarding the EI construct and its measurement, Mayer and Solovey's (1997) conceptualization of EI as an *ability* has proven to be one of the most defensible (Ashkanasy and Daus, 2005; Daus and Ashkanasy, 2005; Mayer et al., 2008). Mayer and Salovey (1997) have proposed that EI is made up of four capacities or skills, including being able to (1) accurately perceive emotions, (2) use emotions to facilitate thought, (3) understand emotions, and (4) manage emotions. Given that high EI involves the capacity to accurately perceive and understand emotions, entrepreneurs with high EI may be able to effectively differentiate between emotions produced by intuitive processes versus other emotions that do not reflect intuition.

Moreover, high EI may be critical to entrepreneurs' effective use of the affectively charged judgments that arise from EES. Studies have shown that emotions or moods influence how individuals process information (Baron, 2008; Elsbach and Barr, 1999; Forgas, 1995). Dane and Pratt (2007, p. 39) observed that, "In essence, both intuitions and emotional appraisals appear to arise through highly similar emotional pathways. Taken together, evidence from organizational, cognitive, and neurological psychology suggests that affect and emotions are an integral component of intuitive judgments."

Therefore, entrepreneurs' ability to identify and manage emotions that arise via the intuitive process versus those that, for example, reflect positive affect or fear, may be central to the successful application of intuition. Positive mood has been shown to enhance intuitive judgments, whereas negative moods have been associated with more complete analyses of situations (Ashby, Isen, and Turken, 1999; Elsbach and Barr, 1999; Weiss and Cropanzano, 1996). Being able to accurately perceive and manage these emotions could enable entrepreneurs to make effective use of their intuitive feelings throughout the venture founding process. Likewise, entrepreneurs are often confronted with situations invoking anxiety and fear. These emotions have been shown to interfere with the intuitive process (Emery, 2001; Sinclair and Ashkanasy, 2005) and could, therefore, undermine entrepreneurs' abilities to develop and utilize intuition based on their EESs during the venture founding process.

**Proposition 14.** *Emotional intelligence will moderate the relationship between an entrepreneur's possession of expert entrepreneurial schemas and the effective use of entrepreneurial intuition, such that the relationship will be more positive when the entrepreneur possesses greater levels of emotional intelligence.*

## 5. Discussion

The current paper makes two principal contributions to the literature on entrepreneurial intuition. First, it recognizes that intuition may be identified as having influenced the venture founding decision when other factors were, in fact, the decision drivers. That is, although intuition may often influence an individual's decision to pursue an entrepreneurial opportunity, other factors that are interpreted by the entrepreneur as intuition may be just as likely to influence the venture founding decision. Second, this paper identifies experiences and characteristics of entrepreneurs that, when present, increase the likelihood that entrepreneurs are truly employing intuition in their decision making. We discuss the theoretical and practical implications of these contributions below.

### 5.1. Theoretical implications

Taken collectively, the preceding observations imply that entrepreneurship theorists should be very circumspect in their depiction of the role of intuition in the entrepreneurial process. The exploration of entrepreneurial phenomena through a cognitive lens has become popular in recent years, as evidenced by special "cognition" issues in journals such as *Entrepreneurship Theory and Practice* (2002, vol. 27, no. 2) and the *Journal of Business Venturing* (2004, vol. 19, no. 2). Considering that intuition operates as a cognitive process, it is likely that studies of intuition will be increasingly common within the entrepreneurship domain.

A risk entrepreneurship theorists face when incorporating intuition into their theories is misrepresentation of the concept, such as when intuition and formal analysis are depicted as different ends of single a decision-making continuum. A good example of this can be found in Khandwalla's (1976/1997) discussion of the technocratic dimension of management decision making. Specifically, Khandwalla equates low technocracy to intuitive decision making. Instead, intuition and formal analysis are better depicted as two distinct bases for decision making (Sinclair and Ashkanasy, 2005) that will, ideally, work in concert (e.g., Hayashi, 2001; Sauter,

1999). Another misrepresentation of the concept of intuition is the attribution to intuition of any decision that was not made on the basis of formal analysis. As Mintzberg (1994) noted, the label of intuition is often used euphemistically when we are not certain about the basis on which we arrived at a particular decision. In recognition of these points, entrepreneurship theorists are advised to consider the possibility that factors other than intuition will often be involved in driving entrepreneurial decisions not made on the basis of formal analysis, even if such decisions ‘feel right’ to the entrepreneur.

A second theoretical implication of this paper, and one related to the preceding point, is that entrepreneurship theorists should refrain from inferring a specific role for intuition within the entrepreneurial process based solely on what entrepreneurs might tell them about this matter. For reasons suggested in several of the preceding propositions, attributions to intuition by entrepreneurs may have little relationship to the actual use of intuition. Accordingly, Sinclair and Ashkanasy (2005) suggest that measures of intuition should include alternative approaches that may counterbalance some of the shortcomings of self-report survey measures. They suggest using alternative methods such as “(1) a description of the decision-making process provided by the participant; (2) a word-count of the description (verbalization); and (3) a measure of the time needed to make the decision” (Sinclair and Ashkanasy, 2005, p. 365). Thus, while intuition may play a crucial role in explaining how some entrepreneurs can, for example, repeatedly found successful ventures, researchers intent on testing such an anticipated relationship will be well advised to triangulate their measures of intuition. Included in the triangulation process should be indicators of the boundary conditions within which true intuition develops, as specified in Propositions 7, 9, 11, 12, 13, and 14.

Related to the preceding observation, a third theoretical implication of this paper is that theories of the role of intuition within the entrepreneurial process should include an explanation of how entrepreneurial intuition develops. To assume that intuition necessarily operates among entrepreneurs in ways that affect their entrepreneurial process-related decisions is to ignore the reality, for example, that intuition is developed through one’s experience. As argued by Mintzberg (quoted in an interview by Campbell, 1991, p. 109), intuition is “rooted in experience of the context.” If individuals have no experience in entrepreneurial contexts, their prior knowledge will not be a basis on which EEs develop, nor will it result in effective entrepreneurial intuition (Shane, 2000). Thus, credible theory regarding intuition in the context of entrepreneurial processes must consider the antecedents of intuition.

A final theoretical implication of this paper links back to the aforementioned assertion that investigating entrepreneurs’ attributions to intuition is warranted regardless of their actual reliance on intuition. Specifically, an entrepreneur’s attribution to intuition, or perceived use of intuition, is arguably an important theoretical construct because our perceptions reflect our personal realities. Just as the concept of perceived environmental uncertainty reflects one’s personal beliefs about the state of the environment for decision-making purposes (Duncan, 1972), the concept of perceived use of entrepreneurial intuition reflects one’s personal beliefs about the effects of intuition on the decision-making process. The reality of these effects is a separate matter. If entrepreneurs believe that intuition is affecting their decisions, they may more easily rationalize the pursuit of inherently speculative entrepreneurial opportunities. Thus, entrepreneurs’ attributions to intuition may be a useful concept in explaining why entrepreneurs underestimate or do not recognize the risk of entrepreneurial situations (Simon et al., 2000). Moreover, if entrepreneurs believe that intuition is affecting their decisions, they may be less likely to engage in formal analysis of entrepreneurial opportunities. In other words, the perceived use of entrepreneurial intuition may substitute for the felt need for formal analysis in the mind of the entrepreneur. This could partially explain why entrepreneurs who tend to underestimate risk also tend to employ less comprehensive decision practices than do managers (Smith et al., 1988).

## 5.2. Practical implications

The observations in this paper suggest three important practical implications. First, to avoid being misled by false intuition – that is, thoughts and feelings that are interpreted as reflecting intuition, but are not – entrepreneurs should actively seek to verify the accuracy of their intuition. This, of course, is not a novel prescription. Even proponents of the use of intuition for decision-making purposes caution individuals to “trust-but-verify” (e.g., Agor, 1986; Myers, 2002). In the case of entrepreneurs, this prescription may be particularly important because of the possibility that, as suggested by several of the preceding propositions, other factors may regularly and powerfully operate in conjunction with the perceived use of entrepreneurial intuition to sway decision making in objectively unwarranted directions.

As implied above, one way that entrepreneurs can be more confident in their intuition is through verifying the presence of the antecedents to intuition outlined in Propositions 7, 9, 11, 12, 13, and 14. For example, by developing their emotional intelligence and metacognitive skills (admittedly, significant challenges themselves), entrepreneurs can learn to better interpret their feelings and emotions. Entrepreneurs can also consciously play the “Devil’s Advocate” in regard to intuitive beliefs (Russo and Schoemaker, 1992) and seek feedback that could suggest the accuracy or inaccuracy of one’s intuition (Hogarth, 2001). Additional thoughts on the matter of verifying intuition can be found in the writings of Austin (1998), Bonabeau (2003), and Eisenhardt (1999).

A second practical implication of this paper is that nascent entrepreneurs should consider placing themselves in business situations that allow their entrepreneurial intuition to develop prior to founding ventures. The preceding arguments collectively suggest the possibility that entrepreneurial intuition will be perceived as operating to some extent as a driver of many venture founding decisions. However, if entrepreneurs have unwarranted confidence in the value of their perceived intuitive judgments, then intuition-influenced venture foundings could have a greater probability of failing. Such ventures would be pursued for reasons that may have little to do with the objective attractiveness of entrepreneurial opportunities. On the other hand, if entrepreneurial intuition is developed legitimately (i.e., informed through the presence of EEs), it can serve as an extremely valuable asset (Allinson et al., 2000; Gaglio and Katz, 2001).

Therefore, the challenge facing entrepreneurs is one of insuring that other factors, such as their self-efficacy, tolerance for ambiguity, or an overconfidence bias, are not being interpreted as actual intuition. They also can be aware of their intuitive cognitive style (i.e., preference for intuitive thinking), which can lead to unfounded beliefs in the veracity of their intuitive thoughts and feelings. While such misinterpretation will always be a possibility, entrepreneurs can reduce its probability of occurrence if they (1) understand how intuition develops and what their intuitive judgments are based on (Dijksterhuis and Nordgren, 2006) and (2) seek relevant knowledge and experience whose lessons are likely to be directly relevant to the entrepreneurial opportunity under consideration.

A final practical implication of this paper is that entrepreneurs should think of their intuition as a complement to – rather than substitute for – formal, empirically-based decision-making approaches (Hodgkinson and Clarke, 2007; Louis and Sutton, 1991; Sandler-Smith and Shefy, 2004). Indeed, entrepreneurs may view the intuitive mode of decision making as a practical, efficient 'default' approach to decision making – an approach which precludes the need to expend scarce resources on formal and more costly decision-making processes. Of course, not all entrepreneurial decisions must be supported by formal analysis. For example, in cases where the entrepreneur has conscious prior knowledge of cause-and-effect relationships in equivalent entrepreneurial scenarios, the expenditure of scarce resources on formal decision-making approaches will often be unwarranted. However, if entrepreneurs are prone to quickly default to a reliance on intuition for decisions of great consequence to their ventures, they may be jeopardizing their ventures' viability by making poorly informed decisions (because intuition is often 'misread' by decision makers [Sandler-Smith and Shefy, 2004]) and missing opportunities to assess the veracity of their perceived intuitive judgments with potentially corroborating formal data and analyses. In short, the combination of formal analysis techniques and intuitive judgments (where those judgments are enabled through the presence of EESs) may be the optimal approach to entrepreneurial decision making (Hodgkinson and Clarke, 2007; Louis and Sutton, 1991).

### 5.3. Future research

There are several places where one might expect intuition to be exercised within the entrepreneurship domain. These are all areas where additional research is needed.

#### 5.3.1. Habitual entrepreneurs and intuition

It is arguable that researchers will learn more about the phenomenon of intuition by studying habitual entrepreneurs than by studying successful (or unsuccessful) entrepreneurs who have only started one or two businesses (MacMillan and Katz, 1991). If intuition is developed over time based on experiences and learning, studying habitual entrepreneurs over time may give the best insight into entrepreneurial intuition. Interesting research questions might be: Do habitual entrepreneurs rely on intuition to a different degree than non-entrepreneurs or less experienced entrepreneurs? Do habitual entrepreneurs have "better" intuition than non-entrepreneurs or less experienced entrepreneurs?

#### 5.3.2. Opportunity recognition and intuition

Intuition is related to one's subconscious ability to recognize patterns among events, data, and experiences (Covin, 2002; Dane and Pratt, 2007). Crossan et al. (1999, p. 526) note that "Entrepreneurs are able to make these novel connections, perceive new or emergent relationships, and discern possibilities that have not been previously identified." Perhaps superior pattern recognition ability is common among individuals who excel at opportunity recognition (Baron, 2004). The relationship between intuitive ability and opportunity recognition ability would seem to be strong and worthy of empirical examination.

#### 5.3.3. Venture capitalists and intuition

Venture capitalists (VCs) are experts in the evaluation of business plans, yet VCs vary considerably in their abilities to consistently identify high potential business investments (MacMillan et al., 1987). Although some venture capitalists have mentioned intuition as an important variable when making investment decisions, there has been little research on this topic (Hisrich and Jankowicz, 1990). Research might examine the following questions: Are experienced VCs more or less likely to rely on intuition than their less experienced counterparts? Are successful VCs more or less likely to rely in intuition than their less successful counterparts? Does the business screening process differ for VCs who are more and less intuitive and, if so, how?

#### 5.3.4. Effectual reasoning and intuition

As argued by Read and Sarasvathy (2005), the use of effectual reasoning in the entrepreneurial decision-making process leads to the development of the entrepreneurial expertise. Such expertise can be reflected in the EESs upon which the effective use of intuition is proposed (see Proposition 11) to be dependent. As such, the effectuation process may be closely tied to the exhibition of entrepreneurial intuition. However, theory and research have yet to reveal precisely how the effectuation process/effectual reasoning and intuition are linked. For example, does effectual reasoning simply lead to the formation of the EESs that support intuitive processes, or does the presence of intuition also build an individual's preference for and reliance upon effectual reasoning? Perhaps proficiency at effectual reasoning is indicative of intuition's effective use. Or perhaps the development of intuitive skills is a principal catalyst for the exhibition of effectual reasoning. Inasmuch as both entrepreneurial intuition and effectual reasoning are valuable assets within the context of entrepreneurship, and both are linked to entrepreneurial expertise (see Mitchell et al., 2005 and Sarasvathy, 2008, respectively), research that models and tests the relationships among these constructs should be a high priority among entrepreneurship scholars.

## 6. Conclusion

In conclusion, to quote Marino (2000, p. 18), “feeling right about a decision may be good for your psyche, but being right about it is better for your reputation.” Entrepreneurs may risk much more than their reputations when they bet on their intuition and are proven wrong. Therefore, it is important that entrepreneurs and those who study them have a solid understanding of why entrepreneurs may attribute their decisions to intuition and which characteristics truly lead to the development of EEs and, subsequently, the effective use of entrepreneurial intuition. Hopefully, this paper has shed some novel light on these topics and will spark further discussion of the proper, actual, and assumed roles of intuition in the entrepreneurial process.

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