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From Opportunity Insight to Opportunity Intention: The Importance of Person-Situation Learning Match

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Within the context of opportunity development as a learning process, this paper explores the intentionality that drives the early stages of this process, from the initial occurrence of an idea to its further exploration and elaboration by a potential entrepreneur. It establishes that the specific situations that induce opportunity insights also affect the roles that individuals' prior knowledge and learning approaches play for the formation of opportunity intentions. The likelihood of acting on their initial opportunity insights depends not only on how much prior knowledge individuals have of the opportunity domain, but also on whether their learning style matches the situation at hand. The results from an experiment show that domain-specific knowledge enables action when there is a person-situation match and impedes it when such a match is lacking.

Introduction

There is now a well-accepted view that entrepreneurial opportunities do not simply “jump out” in a final, ready-made form but emerge in an iterative process of shaping and development. While creativity and insight play an essential role in the birth of opportunity ideas (e.g., Lumpkin, Hills, & Shrader, 2003), it is what prospective entrepreneurs do in reaction to these ideas that eventually provides the final contours of the opportunities—“without action there is no insight” (Gartner, Carter, & Hills, 2003, p. 144). In theorizing about the opportunity development process, it is essential to both capture its ephemeral beginning and fragile sustenance in order to avoid survival bias, and to reconcile the positivist and constructivist accounts of the nature of opportunities (Davidsson, 2003; Dutta & Crossan, 2005; Gartner et al., 2003).

Existing definitions of opportunities, perhaps reflecting their heritage in economic theories, inevitably contain the final result of their realization—the creation of future goods and services (Eckhardt & Shane, 2003; Venkataraman, 1997). Such conception, however, is time neutral—it pertains to opportunities *now*, yet deems them as such only

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after knowing their outcomes in the future. Without shunning uncertainty from our view of the world, it is highly unlikely that the *ex-post* characteristics of an opportunity are known or correctly perceived *ex-ante*, i.e., at the time an opportunity is conceived. The reason for this disconnection between conception and consequences lies in the uncertainty and complexity of the opportunity environment as well as in the possibility that consequences are created in ways not known beforehand.

Therefore, in order to avoid the need for foreknowledge when studying opportunities, it is necessary to look at opportunities through the “worldviews” of individuals, i.e., the maps of the future based on the individuals’ perceptions and beliefs. This would enable researchers to explore the richness of epistemological relativism, i.e., diversity of meanings and interpretations, in regard to the “future,” while avoiding discussion of the (much debatable) ontological nature of the latter (Mir & Watson, 2000). As meaning emerges from one’s prior experience (Weick, 1979), opportunity development is inherently linked to the dynamics of experience and is thus a learning process (Cope, 2005; Dutta & Crossan, 2005; Minniti & Bygrave, 2001; Ravasi & Turati, 2005). The process of individual learning from experience is incessant, cyclical (Kolb, 1984), and to the extent that the individual does not seek to interact with others, unobtrusive. Yet, when viewed in the context of the purposive nature of opportunity development, whereby potential entrepreneurs seek to engage and organize other social actors, it transcends the individual agent and becomes organizational in nature (Dutta & Crossan, 2005; Ravasi & Turati, 2005).

But, in the absence of proximal or tangible commercial outcomes, how might we represent the emergence and early development of opportunities, particularly their transition from involving a single individual to engaging a broader social audience? The 4I organizational learning framework highlights two individual-level processes that capture this early gestation and transition of opportunities: Individuals engage in *intuiting* that generates ideas with perceived potential; they then trigger a process of *interpreting* as they try to clarify those ideas and engage third parties in further refining and gaining support for the ideas¹ (Crossan, Lane, & White, 1999; Dutta & Crossan, 2005). In this individual domain, it is important to understand not only how insights emerge through intuiting, but also what propels individuals to take their novel ideas forward and begin to shape them through the process of interpreting (Bontis, Crossan, & Hulland, 2002). Yet, this latter problem has remained relatively unexplored. Why do some people act on their insights—search for information or engage prospective customers, suppliers, employees, advisors, or investors in order to clarify their ideas—while others find it comfortable to savor their ideas in an armchair? While prior knowledge of the opportunity domain influences the generation and nature of one’s ideas (Shane, 2000; Shepherd & DeTienne, 2005), it is by itself insufficient to explain such action since its effectiveness would likely vary in different situations and there are different ways for one to apply it to a specific situation (Bontis et al., 2002; Corbett, 2007; Weisberg, 1999).

1. While there are various models of organizational learning in the current literature, there are several considerations that make the 4I framework particularly useful for the context of opportunity development and, thus, to this paper. First, it is possible, without endangering the validity of the model, to recast its organizational boundaries from those of an existing organization to the more general realm of a developing opportunity. Indeed, the 4I framework was originally conceived to represent the process of strategic renewal, which pertains to reorganization in pursuit of new opportunities. In the current case, the reorganization can be conceived as moving from no organization at all to an emerging organization. Second, the model lies well on a foundation of epistemological relativism, as the processes of intuiting, interpreting, and integrating allow for a diversity of interpretations and meanings. In this sense, the model allows for the “worldview” of individuals to feed the learning process. Third, while individual ideas and actions play important roles, the model covers higher, collective levels of meaning generation and action.

The purpose of this paper is to explore the intentionality that drives these early stages of the opportunity development process. It establishes that the specific situations that induce opportunity insights also affect the roles that individuals' prior knowledge and learning approaches play for their likelihood of acting on these insights. Several considerations underlie the choice of intention (rather than action itself) as the object of study. First, opportunity emergence is an intention-driven process (Krueger, 2000). As interpreting involves a conscious effort that occurs not only in the minds of potential entrepreneurs but also in their interaction with other (potential) stakeholders, moving from intuiting to interpreting is an intentional process. Second, given that the transition from intuiting to interpreting represents a behavior that is difficult to observe, intentions can offer critical insights into the underlying processes (Ajzen, 1991). Third, intentionality is an important feature of emerging organizations (Katz & Gartner, 1988) and has a significant influence on the entrepreneurial process as it directs attention, experience, and action (Bird, 1988). Finally, while much work has examined entrepreneurial intention in its general form of "starting one's own business" (Krueger, 1993; Krueger, Reilly, & Carsrud, 2000), this paper explores *opportunity* intention, i.e., the concrete intention associated with a particular idea.

The paper is structured as follows. In the next section, it discusses the nature of intuiting and interpreting in the early stages of opportunity development as well as the formation of intentions—in terms of the individual and situational factors that complement one's prior knowledge of the opportunity domain—that drive the transition between the two. More specifically, it distinguishes two kinds of situations—demand-driven and supply-driven—in which opportunity insights emerge through qualitatively different processes. In addition, it captures the different ways in which individuals may process and integrate these insights through the construct of learning style, based on Kolb's (1984) experiential learning theory. Next, in a specially designed experiment, the paper shows that the direction of the effect of prior knowledge on the likelihood of action depends on whether there is match or mismatch between an individual's learning style and the situation at hand. This work contributes to the literatures of opportunity development and individual learning by specifying the individual and situational learning contingencies that drive the opportunity process from its gestation forward. In addition, it enhances our understanding of entrepreneurial intentions by linking their formation in specific situations to the individuality of learning.

From Opportunity Insight to Opportunity Intention

Intuiting and Interpreting in Opportunity Development

Intuiting is "the preconscious recognition of the pattern and/or possibilities inherent in a personal stream of experience" (Weick, 1995, p. 25). This is an individual process that triggers the learning associated with opportunity development. The essence of this process is an individual's becoming aware of a business idea that he or she perceives as holding some perceived potential in meeting current or emerging customer needs (Dutta & Crossan, 2005). *Interpreting* is "the explaining, through words and/or actions, of an insight or idea to one's self and to others" (Crossan et al., 1999, p. 525). In this process, potential entrepreneurs engage in explaining and defending the "fuzzy" images of their insights. They thus interact not only with their immediate social network—family, friends, classmates, colleagues, teachers, etc.—but also with some potentially more instrumental stakeholders to the development of the idea: partners, informal and formal investors, consultants, accountants, customers, suppliers, employees, etc. Through these social

interactions, a shared understanding of the opportunity idea begins to emerge and thus the overall learning process enters the *integrating* phase, i.e., it becomes organizational in nature. This is the stage at which a nascent entrepreneurial team may be formed as the idea shows continuing merit and induces an even more intensive pursuit.

Of main interest for this paper is the unfolding of the learning process at the individual level, i.e., the transition from intuiting to interpreting. The generation and refinement of opportunity ideas typically occurs at a pre-venture stage, i.e., before there is any formal organization around the pursuit of these ideas. Given that the ideas passing through this stage pertain to an indeterminate future enshrined in *Knightian* uncertainty (Dequech, 2000) and that an *ex-ante* judgment of their eventual commercial success is thus unreliable, their perceived feasibility and potential are propped only by individual beliefs. Because eventual commercial success is dependent on a multitude of external and execution factors, making a connection between the quality of intuition and such success is very difficult—“. . . intuitive insights cannot be judged right or wrong *ex ante*. They are simply possibilities” (Crossan et al., 1999, p. 526). This suggests that understanding what propels individuals forward—to discuss and defend their ideas in their broader social context—necessitates a forward- rather than backward-looking theoretical frame, i.e., leveling with and incorporating the uncertainty that the individual perceives rather than rationalizing *post hoc* the differences between the successes and failures.

Domain Knowledge and Intention Formation

Represented in most general terms, individual intention and action involve a configuration of beliefs and desires (Ajzen, 1991; Greve, 2001). Similarly, in the entrepreneurship literature, researchers have conjectured that the two main factors affecting entrepreneurial intentions are perceived desirability and perceived feasibility (Boyd & Vozikis, 1994; Krueger, 2000; Krueger et al., 2000), which are in turn built upon a constellation of personal and contextual characteristics (Bird, 1988; Hmieleski & Corbett, 2006). Perceived desirability pertains to the extent to which entrepreneurship is a valid career option for the individual. In turn, perceived feasibility pertains to whether the individual believes he or she would be successful in an entrepreneurial career; it is associated with the concept of self-efficacy (Bandura, 1977). The main focus of the existing literature on entrepreneurial intentions has been individuals' general intentions of founding their own firms. Such a broad intention may be an imprecise predictor of whether an individual would (intend to) act on a particular idea in a particular situation. Even if an individual perceived an entrepreneurial career as both desirable and feasible, he or she is unlikely to act on just any idea that comes along or that shows some initial promise.

Understanding the formation of one's intention to act on a particular opportunity idea entails applying the belief–desire configuration to the idea and acknowledging its inherent uncertainty. Accordingly, we can conceive of the belief as the amount of uncertainty one perceives and of the desire as one's willingness to bear this uncertainty (McMullen & Shepherd, 2006). In this sense, the learning perspective introduced in this paper pertains to individual beliefs rather than desires. Therefore, it is important to note here that as beliefs and desires independently affect individual intentions, making theoretical attributions to the effect of learning on intentions presupposes that individuals do not differ in their desire. In other words, one boundary condition for the theoretical exposition that follows is that individuals are equal in their perceived desirability of the opportunity situation, i.e., they have the proper career motivation that potentially enables their entrepreneurial actions (Carter, Gartner, Shaver, & Gatewood, 2003) and that these actions are

not restrained by particular personal, motivation-affecting characteristics (Baum, Locke, & Smith, 2001; Rauch & Frese, 2000) or social norms (Krueger, 2000).

Individuals emerge from the process of intuiting with an “inexplicable,” preverbal sense of what is possible (Crossan et al., 1999). Their initial interpretation of this sense makes it communicable by giving it verbal shape and meaning. The intention to communicate this to others then depends on whether the self-derived meaning reinforces or discredits the initial intuitive sense of possibility. But how might we distinguish between cases in which this early self-interpretation enhances the original intuition and cases in which it impedes it?

Differences in interpretations of the same situations or insights are not necessarily due to differences in the perceived quality of the information that individuals receive, but to the different meanings that a given piece of information may induce (Crossan et al., 1999; Daft & Huber, 1987). Perception and interpretation are in turn guided by the mental representations or cognitive maps (Huff, 1990) that individuals develop of the particular domain. Because these maps differ in their structure and complexity across individuals, different individuals are likely to interpret the same stimulus differently (Walsh, 1988). At the basis of such differences in map structures and in resulting interpretations lie one’s domain-specific knowledge and associated knowledge structures (Chase & Simon, 1973; Walsh, 1995). Experts and novices differ in their cognitive representations of particular problems, and such differences imply different abilities to form new knowledge associations (Glaser & Chi, 1988) and thus achieve novel interpretations. In particular, experts encode and process information in a more abstract, complex way than novices (Chi, Glaser, & Rees, 1982; Gitomer, 1988).

One particular function of cognitive maps is that they help reveal gaps in information or reasoning that require more immediate attention (Fiol & Huff, 1997). To the extent that these gaps are seen as insurmountable, they might undermine one’s sense of control of the situation at hand, thereby weakening one’s opportunity perception (Dutton & Jackson, 1987). Therefore, whether self-interpretation reinforces or undermines one’s original belief could be related to the perceived difficulty and importance of the unknowns that are exposed in the opportunity insight. Because such exposure is situation- *and* individual-specific, we need to examine both the types of situations that individuals may face and the ways in which they may respond to such situations.

Two Kinds of Insight Situations

An “insight” represents the process through which a person suddenly moves from a state of not knowing to a state of knowing (Mayer, 1992). Finke (1990) further distinguishes between *convergent* and *divergent* insight on the basis of the thinking and abstraction that they involve. He illustrates this with the interplay between *function* and *form* that each type of insight involves. Convergent insight is of a form-follows-function type. It involves making sense out of apparently disconnected facts and is thus applied and specific to a particular situation. An example of such insight is the realization that a series of observations of different social behaviors can be explained by some underlying socio-demographic trend. On the other hand, divergent insight is of a function-follows-form type. It is outward flowing, generating possibilities that one might not ordinarily consider, and thus, it involves a high level of abstraction (Finke, 1990, 1995). An example of divergent insight is the realization that the principle of relativity from the domain of physics can be applied to the art domains of painting and literature.

The insights associated with intuiting new business ideas can similarly be distinguished as convergent or divergent. In broadest terms, a person’s business idea constitutes

a mental image of a particular group of customers benefiting from using a particular product or service (Sarasvathy, Dew, Velamuri, & Venkataraman, 2003). To the extent that the specific customer needs and the matching products or services are not immediately visible or available to the particular individual, the intuiting process can be conceived as “filling in” the gaps in the available information in order to complete the mental image. When the filling brings logical closure, the insight may be deemed convergent; when it creates abstract, outside-the-box possibilities, the insight may be deemed divergent.

In this regard, we may conceive of different information-based situations depending on whether they induce convergent or divergent insights. To facilitate this, it would be useful to think of products as collectives of *functions* and of customer needs as the *forms* through which one of these product functions exists in the domain of economic activity. On this basis, given that perceptions of needs and products may be available or missing as one enters the process of intuiting, there are two qualitatively different insight-inducing situations. The first, *demand-driven*, pertains to situations in which one is aware of current or emerging customer needs but lacks awareness of possible products that can meet such needs. The imagination of products that can satisfy given needs, given the assumptions mentioned earlier, represents a divergent insight. It involves finding unusual uses for common things (i.e., new functions) or common uses for unusual things. A pertinent example of this is the conception of the first Nike long-distance running shoe: Phil Knight and Bill Bowerman were aware that long-distance runners needed shoes that were lighter, and that had better cushioning and lateral stability, and they conceived of a new sole out of waffle iron and latex.

The second type, *supply-driven*, pertains to situations in which one is aware of existing or emerging products yet lacks immediate sense of the possible customer needs that these products can satisfy. This is related to the emergence of new technologies or inventions for which no immediate application is envisaged. The imagination of customer needs that a given product can satisfy in turn represents a convergent insight. It entails bringing closure to a multitude of functional possibilities by conceiving of an appropriate form (i.e., need, practical application). The introduction of the *Jacuzzi* is a good example in this regard: In 1968, Roy Jacuzzi, following in the inventive spirit of his family in regard to pump systems, invented the first self-contained whirlpool bath. Not immediately aware of its possible use, he conceived of it as a recreational device and started marketing it accordingly, eventually creating a booming market.

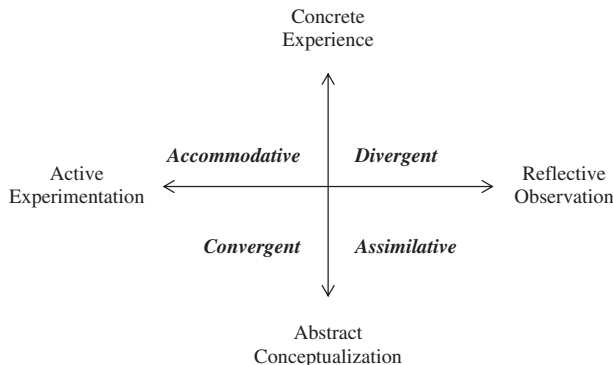
Intuiting and Experiential Learning

To further understand whether one’s initial interpretation of his or her divergent or convergent insights would be reinforcing or undermining, we need to account for how individuals process their intuiting experience into personal knowledge in this interpretation process. Experiential learning theory presents an account of transforming experience into knowledge (Kolb, 1984). It is one of the most influential theories in management learning (Kayes, 2002; Vince, 1998) as well as in a wide range of other disciplines (Kolb, Boyatzis, & Mainemelis, 2001). In this theory, learning is an emergent process continuously shaped by one’s interaction with the surrounding environment. One learns by resolving dialectical tensions between the opposing learning modes of grasping and transforming experience. In grasping experience, the tension pertains to relying on concrete experience vs. abstract conceptualization. In transforming experience, the tension is between engaging in active experimentation vs. reflective observation. The particular resolution of these tensions in a given situation determines the direction and nature of the learning process.

Figure 1

Overview of the Structure of the Experiential Learning Process and the Basic Learning Templates (Adapted from Kolb, 1984)

The vertical axis represents the *grasping* of experience; the horizontal axis represents the *transformation* of experience.



There are four ways—the different combinations between the two sets of learning modes—in which the aforementioned tensions may be resolved. Each of these represents a distinct knowledge-creation “template” that generates a distinct learning outcome (knowledge)—divergent, assimilative, convergent, and accommodative.² Divergent knowledge involves observing the surrounding environment and imagining possibilities associated with selected discrepant cues; assimilative knowledge involves reconceptualizing one’s perceived reality based on the integration of such discrepant cues; convergent knowledge involves selecting a course of action based on and in pursuit of the expectations that one’s new conception of reality generates; accommodative knowledge involves the creation of new events and experiences, which in turn spin the learning wheel further. Each of these types of resulting knowledge captures a particular way that an individual and a situation interact. Figure 1 presents a summary of these four learning templates.

Because of the repetitive situations with which one deals in the course of one’s life, from early personality development through education to professional experience, one’s interaction with the surrounding environment follows stable patterns and thus results in higher reliance on some of the knowledge-creation templates and in lower reliance on the others (Kolb, 1984). In other words, when faced with a particular situation, individuals may tend to respond to (i.e., learn from) it in a way they have done in the past. As Kolb (1984) argues, “This self-programming conditioned by experience determines the extent to which the person emphasizes the four modes of the learning process . . .,” these programmed tendencies represent a distinguishing individual characteristic: one’s learning style (p. 64).

Juxtaposing the four experiential learning templates against the different stages involved in opportunity recognition and exploitation, Corbett (2005) argues that divergent learning (i.e., using a divergent knowledge-creation template) is instrumental for the

2. While Kolb (1984) uses the term “elementary form of knowledge,” I use the term “template” as a more vivid analogy for the notion of different types of knowledge creation.

initial evaluation of opportunity insights. This is facilitated by the exercise of imagination, appreciation of multiple perspectives, and sensitivity to meanings and values that divergent learning entails. Yet, given that different situations and available knowledge induce qualitatively different insights, it is plausible that while divergent learning reinforces the original insight in some situations, it impedes it in others. To the extent that, coupled with the complexity of one's cognitive map, divergent learning helps reveal what one perceives as insurmountable gaps in information and reasoning, divergent learning may not be appropriate for such situations.

In view of the dialectic nature of the experiential learning process, it would be useful to view divergent learning together with its dialectically opposite learning template—convergent learning.³ In other words, in interpreting their initial insights, individuals may use divergent *or* convergent learning, depending upon their relative reliance on these two forms of learning, as programmed in their learning styles. The applied learning template may, in turn, be matching or mismatching the convergent or divergent nature of the opportunity insight.

The analogy of shooting a film scene can help illustrate the relationship between the learning approach and the original idea-generating insight. The original insight pertains to the position of the “director” as the scene begins: It is high up (a broader view) for divergent insights and down low (a narrow, focused view) for convergent insights. These differences in position correspond well to what Bingham and Eisenhardt (2005) refer to as levels of abstraction. A lower level of abstraction is associated with a sharpened focus, while a higher level of abstraction enables higher order thinking and opens unconventional possibilities. The learning template that the individual uses, on the other hand, pertains to the usage of cameras: Divergent learning activates several cameras and thus elicits multiple angles and perspectives, while convergent learning activates a single camera, zooming in to highlight particular details within the selected range. Divergent learning is thus compatible with (i.e., matching) divergent insight, as it enables the “director” to maintain an open perspective and to take full advantage of the view from his high-altitude position. It entails a focus on values and needs which corresponds well to the personal orientation necessary for responding to demand-driven contexts (Kolb, 1984). On the other hand, convergent learning is compatible with convergent insight, as it maintains the focused perspective and thus enables practical experimentation. It entails focus on application (Kolb, 1984) that corresponds well to the technical orientation necessary for responding to supply-driven contexts. Table 1 provides an overview of these matching relationships.

When there is a match between the learning approach and insight, people can make productive use of their domain-specific knowledge. Whether such knowledge pertains to the nature and implications of personal values and needs or to various product or location characteristics, it is evaluated from a compatible perspective and thus helps reinforce the original insight. Therefore, in such situations, potential entrepreneurs are less likely to discover inconsistencies in their insights and, as a result, are more likely to engage in their further interpretation and elaboration. Conversely, where the insight and learning approach are mismatched, people's domain-specific knowledge can serve to highlight

3. It is important to note here that in Kolb's original exposition, the dialectical opposition pertains to the different learning modes within the dimensions of grasping and transforming experience. In this sense, the dialectical opposition between the convergent and divergent learning templates is derived from the fact that each of these templates combines different modes of grasping and transforming experience. Convergent learning uses abstract conceptualization and active experimentation, whereas divergent learning uses concrete experience and reflective observation (see Figure 1).

Table 1

The Correspondence between Type of Insight and Convergent vs. Divergent Learning

Insight	Convergent insight	Divergent insight
Definition/Characteristics	Process: making sense of apparently disconnected facts Orientation: Situation specific	Process: generating possibilities that one might not ordinarily consider Orientation: high level of abstraction
Example	<i>Based on observation or awareness of traffic and demographic patterns, opening a coffee shop at a particular location.</i>	<i>Based on hearing personal complaints about the hectic nature of mornings at home, offering a morning coffee/breakfast together with the newspaper delivery.</i>
Learning Style	Convergent—higher reliance on convergent knowledge	Divergent—higher reliance on divergent knowledge
Definition/Characteristics	Grasping by: abstract conceptualization Focus on: • Using logic, ideas, and concepts • Building general theories Transformation by: active experimentation Focus on: • Actively changing situations • Practical application	Grasping by: concrete experience Focus on: • Being involved in experiences • Appreciating uniqueness and complexity Transformation by: reflective observation Focus on: • Understanding ideas and situations • Possibilities—what is true; how things happen

Note: Learning style definitions and characteristics adapted from Kolb (1984, chapter 4).

information or reasoning gaps. Having more knowledge can in fact undermine one’s initial conviction, if that knowledge is used to appraise the practical application of abstract ideas or the abstract implications of practical ideas. As a result, in such situations of mismatch, potential entrepreneurs will be less likely to explore their insights further.⁴ This leads us to the following hypothesis:

Hypotheses: The effect of domain-specific knowledge on potential entrepreneurs’ likelihood of acting on their opportunity insights will be contingent upon the match between their learning styles and the insight situation at hand. It will be (1) positive when such match exists, and (2) negative when such a match is lacking.

Method

In the premises of this paper lies the recognition that different people make different sense of their social and economic environment, and it is this diversity of individual sensemaking that enables (or impedes) the learning process of opportunity development.

4. One can draw a parallel between these effects of match and mismatch and the notion of biases and heuristics in entrepreneurial cognition (e.g., Mitchell et al., 2002). Even though cognitive biases in this perspective are conceived as distinguishing features of entrepreneurs vs. nonentrepreneurs, there are arguments that some of these biases are in fact situation-induced (Baron, 1998). Although beyond the scope of the current paper, the idea that the match between the insight situation and learning style produces positive biases, while the mismatch produces negative biases is worthy of further exploration.

While appreciating individual ideas requires a closer, more intimate involvement with the processes of intuiting and interpreting—and thus necessitates a qualitative, interpretative research methodology—the hypothesis mentioned earlier is not predicated on a rich understanding of the underlying idea. It pertains to a systematic variation in the formation of specific intentions depending on the individual and situational factors surrounding the underlying idea. As such, its testing is conducive to a quantitative methodology, albeit in a setting that ensures sufficient internal validity. An experiment facilitates internal validity by creating a setting that allows the relevant constructs of the theory to interact (Zelditch, 1969). In an experimental context, a standardized treatment across participants minimizes exogenous variance, including the one stemming from the sensemaking diversity among the participants. In addition, given that the hypothesis deals with both how different individuals respond to the same situation and how the same individual responds to different situations, the empirical study that follows is based on a repeated measures design, whereby each participant responded to two scenarios and thus served as his or her own control across scenarios.

Participants and Study Procedure

The two main considerations involved in choosing a group of participants for the study were (1) relative homogeneity in regard to the boundary conditions to the model (e.g., motivation to become entrepreneurs and personal characteristics affecting action) and (2) relative heterogeneity in regard to domain-specific knowledge and learning style. Therefore, 95 MBA and executive MBA students, members of the Entrepreneurship Club at a top international business school, took part in the experiment conducted online. In exchange for participation, after completing the study the students received personal learning style feedback. The participants represented a diverse and widely experienced group of individuals: 32 countries of origin, average age of 31 years, average work experience of over 9 years, and 31% with prior entrepreneurial experience. Although there was a dominance of male over female participants (74% vs. 26%), this was consistent with the higher prevalence of males among nascent entrepreneurs in general (Reynolds & White, 1997) and among MBA students in particular.

There have been mixed feelings among researchers regarding the participation of students in scientific experiments. On one hand this is an established practice, especially for undergraduate students, in studies in social or cognitive psychology. On the other hand, there have been criticisms on the suitability of students (especially undergraduate ones) for experiments in more applied fields like accounting or management (Copeland, Francia, & Strawser, 1973; Robinson, Huefner, & Hunt, 1991). The gist of the raised objections is that students are typically novices and do not possess the knowledge structures of people with more extensive experience in a particular field. However, while this argument may be potent for undergraduate students, it is less so for MBA students, particularly those participating in the current study. As shown earlier, these participants have extensive prior education and work experience, and are actively interested in entrepreneurial careers. This makes them “mature” enough to engage in and be serious about entrepreneurial opportunities. In addition, researchers have argued that MBA entrepreneurship students are valid referents for the study of opportunity recognition processes through experiments (Gaglio & Katz, 2001). Finally, recent studies have indeed shown that this approach yields valuable insights (Shepherd & De Tienne, 2005).

The main goal of the experiment was to induce participants to generate opportunity insights and to record their willingness to explore these insights further, i.e., their likelihood of making the transition from intuiting to interpreting. In creating the context for the

experiment, it was necessary to ensure that factors that could potentially affect action were controlled and standardized across participants. Therefore, the description of the experiment told participants (1) that they had been considering starting their own business given the right opportunity (motivation), (2) that they possessed the financial resources to go without income for an extended period of time (financial and lifestyle concerns), (3) that several recent start-ups in the area had received venture capital (availability of finance), and (4) that they had attended a recent trade show on enterprise management software at which they had heard several intriguing statements (information acquisition). They were then presented with two scenarios in a random order, intended to represent demand- and supply-driven situations. To further reduce the unsystematic variance across scenarios, both scenarios were based on the same industry, enterprise management software.

In order to achieve the desired situational perception by the participants, each scenario contained a manipulation of the extent to which a participant could discern sources of demand or supply. As a manipulation check, participants stated their degree of confidence, on a 0–3 scale, in identifying (1) a currently unsatisfied customer demand, and (2) a product that could be introduced to the market in each scenario. On average, the two scenarios showed the intended relative patterns of participant awareness of customer needs and products: In scenario 1 customer awareness was stronger than product awareness (2.04 vs. 1.45, $p < 0.001$), and in scenario 2 customer awareness was weaker than product awareness (0.74 vs. 1.19, $p < 0.001$). Nevertheless, for a large number of responses, the scores for customer and product awareness were equal, suggesting that those responses could not be classified as demand- or supply-driven. Therefore, the subsequent analysis used only the responses for which the awareness scores were different. This approach yielded a total of 107 usable responses. The responses for which customer awareness was stronger than product awareness were coded as demand-driven, whereas those for which product awareness was stronger than customer awareness were coded as supply-driven.⁵

Measures

Action Likelihood. For each scenario, participants were asked to think of a business opportunity that came to mind. Their likelihood of acting on these opportunity insights was measured by the degree to which subjects were willing to undertake each of the following nascent entrepreneurial activities associated with seeking further interpretation and clarification of their initial ideas: (1) Spend some time outlining a business plan for the pursuit of the opportunity; (2) discuss the opportunity with potential investors; (3) discuss the opportunity with friends, colleagues, or advisors; (4) seek potential partners for exploiting this opportunity; and (5) invest some of your own money in researching the viability of the opportunity. Each of these activities represents a more formal engagement with the development of one's ideas and thus reflects well the onset of the social part of the interpretation process as discussed by Crossan et al. (1999). Thus, to the extent that they were willing to engage in these activities, they were making the transition from intuiting to interpreting. The participants' willingness to undertake each activity was measured on a 5-point scale, ranging from "very unlikely" to "very likely." Their action

5. In order to ensure that this dichotomization did not misrepresent the cases in which the customer and product awareness scores were relatively close to one another, I ran additional analyses (not reported due to space limitation) controlling for the difference in these awareness scores. There was no change in either the pattern or the significance of the results.

likelihood was represented by the average of the five scores. This measure had high reliability, as indicated by Cronbach's alpha statistic: 0.86 for scenario 1 and 0.89 for scenario 2.

Learning Style. To measure whether a participant tended to engage in divergent or convergent learning when self-interpreting his or her opportunity insight, scores for the four experiential learning modes were first obtained using Kolb's Learning Style Inventory (LSI) (Kolb, 1985). This measurement instrument consists of 12 incomplete statements. For each of them respondents are asked to rank with scores of 1 to 4, in order of increasing preference, a set of four given endings. The endings for each statement represent verbs or adjectives that illustrate the four learning modes. The forced ranking of these endings is intended to represent the dialectical learning pressure that one resolves in responding to experiential situations (Kolb, 1984). Based on the ranking scores for each learning dimension and in each statement, the LSI yields a total score of 120 distributed among the four learning modes, thereby determining the relative importance of each. Therefore, the products of the scores for concrete experience and reflective observation (i.e., the components of divergent learning) and of the scores for abstract conceptualization and active experimentation (i.e., the components of convergent learning) represented the degrees to which one relied on divergent and convergent learning in particular situations. Because experiential learning theory emphasizes the qualitative, dialectic difference between convergent and divergent learning and not the gradation within each learning approach, one's dominant learning approach was captured by the following dichotomous variable: 1 if one had higher reliance on convergent learning and 0 if one had higher reliance on divergent learning.⁶

Despite the popularity of the LSI in the management-learning literature, the nature of the instrument and the construct it measures have fueled discussion over the instrument's validity and reliability. In regard to its construct validity, particularly the presence and independence of the two dimensions of experiential learning, there have been early claims for both the existence (Katz, 1986; Marshall & Merritt, 1985) and lack (Cornwell, Manfredo, & Dunlap, 1991; Friedman & Stumpf, 1980) of such validity in the first version of the instrument released in 1976. Concerns with the internal consistency and test-retest reliability of the first version (Friedman & Stumpf, 1981) have been addressed both conceptually (Kolb, 1981) and by further improvements to the instrument. The second version, released in 1985, has shown improvements in both validity and reliability (Sims, Veres, Watson, & Buckner, 1986; Veres, Sims, & Shake, 1987). Specifically, the randomization of the item order in the second version has significantly improved the test-retest reliability of the instrument (Veres, Sims, & Locklear, 1991). More recently, opinions have converged on the conclusion that the LSI has high construct validity (Loo, 1999; Yahya, 1998). Incorporating previous criticisms and suggestions, the latest version (third) of the LSI has shown significantly improved validity and reliability (Kolb, 1999).

From a psychometric point of view, some the main concerns with the LSI have been in relation to its forced-choice nature. Specifically, although forced-choice methods necessarily reduce biases like social desirability (Saville & Wilson, 1991), they may also create problems by providing ipsative measures, i.e., measures with the same summed

6. Although there were no cases of equal reliance on convergent and divergent learning, there were still cases in which the reliance was close to evenly split. In order to ensure that the dichotomization did not misrepresent such cases, I ran additional analyses (not reported due to space limitation) controlling for the difference between the convergent and divergent learning scores. There was no change in either the pattern or the significance of the results.

scores (Dunlap & Cornwell, 1994). Ipsativity may create disturbance in the statistical analyses through spurious negative correlations among the items in the measure, thereby impeding normative comparisons across individuals. Nevertheless ipsativity, if used consistently with the underlying theory, offers advantages that can enhance the internal validity of a theory test. There are two considerations that were instrumental in choosing the original, ipsative version of the LSI over its normative alternative (Geiger, Boyle, & Pinto, 1993). First, conceptually, the LSI has been designed to reflect the dialectical nature of learning and thus necessitates some form of forced choice. In this regard, if the usage of the instrument is limited to categorizing individuals (i.e., as in the current study) and does not involve normative comparisons across individuals, ipsativity is an advantage rather than drawback, as it reflects the consistency between underlying theory, the nature of the instrument, and its intended usage. Second, in developing this study's hypothesis, divergent and convergent learning were presented as dialectically opposing one another—absence of divergent learning approach implies the presence of convergent one and vice versa. This suggests that the validity of classifying someone as relying on divergent or convergent learning is based on these two learning scores being mutually exclusive and collectively exhaustive (i.e., ipsative). Variables are ipsative if the asymptotic expected value of their intercorrelations is equal to $-1/(m - 1)$, where m is the number of variables (Greer & Dunlap, 1997). This was indeed the case for the variables representing a participant's relative reliance on divergent and convergent learning—their correlation was -0.96 . As a result, consistent with the theoretical conception, an individual can be classified as predominantly using either divergent or convergent learning and cannot be a predominant user of both.

Match between Learning Style and Situation. The following dichotomous variable reflected the match between one's reliance on convergent or divergent learning and the insight situation at hand: A match (a value of 1) was recorded when respondents were using a divergent approach in the demand-driven situation or a convergent approach in the supply-driven situation. The remaining combinations—a divergent approach in the supply-driven situation and a convergent approach in the demand-driven situation were recorded as a mismatch (a value of 0).

Domain-Specific Knowledge. There is a widely used procedure in experimental research on experts vs. novices to assign respondents into one of these two groups on the basis of their self-assessment and/or verification of their domain knowledge (e.g. Hinds, Patterson, & Pfeffer, 2001). As part of the experiment, participants provided their own assessment of their knowledge of the customer and production aspects of the enterprise software management industry. These were measured on a 4-point scale, with an interitem correlation of 0.79. The sum of these two items was used as a measure of a participant's domain-specific knowledge. In order to check the validity of the measure, participants were divided along the median into a high- and low-knowledge group, and were compared in terms of their industry experience. The high-knowledge group dominated the low-knowledge one in terms of average number of years spent in software (2.33 vs. 0.45, $p < 0.001$) and in high-tech (3.4 vs. 0.9, $p < 0.001$) industries.

Control Variables. Several control variables were included in the analysis in order to rule out possible confounding effects on action likelihood. First, participants' age, gender, and years of work experience captured their demographics and human capital. Age was measured on a 7-point scale capturing the age groups (in 5-year increments) to which individuals belonged. The gender coding used was 1 for male and 2 for female. Next,

given that people with prior entrepreneurial experience may be more likely to act on their ideas, an indicator variable was included for whether a participant had such experience (1 if the participant had started/owned their own business and 0 if otherwise). Finally, to remove the scenario effects, the model included an indicator variable for scenario, with scenario 1 as the omitted category.

Analysis

The testing of the hypothesis was based on ordinary least squares (OLS) regression. Given that there was more than one response per participant, in order to account for the nonindependence of residuals, the estimation of the effects on action likelihood included a robust variance estimator adjusted for within-cluster correlation in the standard errors of the coefficients in the model (Rogers, 1993; Williams, 2000). This method also incorporates a Huber–White “sandwich” estimation of the variance, which accounts for sample-to-sample variability of parameter estimates and which corrects for possible heteroskedasticity (Huber, 1967; White, 1980). Further, a Ramsey regression specification error test for omitted variables revealed no unobserved heterogeneity bias in the estimation—the null hypothesis of no omitted variables could not be rejected ($F_{3,95} = 0.85$; $p > 0.47$). Finally, the variance inflation factor (VIF) scores for each variable—all below 8—suggested that multicollinearity was not an issue.

Results

The descriptive statistics are shown in Table 2. Table 3 contains the results from the OLS estimation, with the variables entered in three steps. Model 1, the base model, contains only the control variables; model 2 includes the main effects of match and domain-specific knowledge; model 3 further adds the interaction term for match and domain-specific knowledge. The base model was significant (R-square = 0.19; $p < 0.001$) and the addition of the main effects of match and domain-specific knowledge in model 2

Table 2

Descriptive Statistics and Correlations (N = 107)

	Mean	SD	1	2	3	4	5	6	7	8
1. Action likelihood	2.26	1.08								
2. Match	0.45	0.50	-0.16							
3. Domain-specific knowledge	3.45	1.49	-0.00	-0.06						
4. Match × knowledge	1.50	1.89	-0.05	0.89*	0.21*					
5. Scenario 2	0.48	0.50	-0.34*	0.34*	0.00	0.30*				
6. Age	2.63	0.75	-0.05	0.10	0.02	0.02	0.00			
7. Gender	1.25	0.44	0.16*	0.04	-0.15*	-0.03	0.00	-0.00		
8. Entrepreneurial experience	0.31	0.46	-0.02	0.05	-0.02	0.07	0.00	0.00	-0.08	
9. Work experience	10.04	5.75	-0.01	0.01	0.19*	0.00	0.00	0.64*	0.10	0.07

* $p < 0.05$.

SD, standard deviation.

Table 3

OLS Estimation Results for Action
Likelihood

	Model 1	Model 2	Model 3
Age	-0.20	-0.17	-0.12
Gender	0.32	0.35	0.38
Entrepreneurial experience	0.43*	0.45*	0.39*
Work experience	0.02	0.02	0.02
Scenario 2	-0.73***	-0.69***	-0.67***
Match between learning style and situation		-0.11	-1.42**
Domain-specific knowledge		0.02	-0.11
Match × domain-specific knowledge			0.38***
Constant	2.39***	2.28***	2.55***
Model			
R ²	0.191	0.194	0.251
F-statistic	5.79***	4.06***	5.08***
Change in R ²		0.00	0.06**
F-change		0.15	5.77*
N	107	107	107

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$.

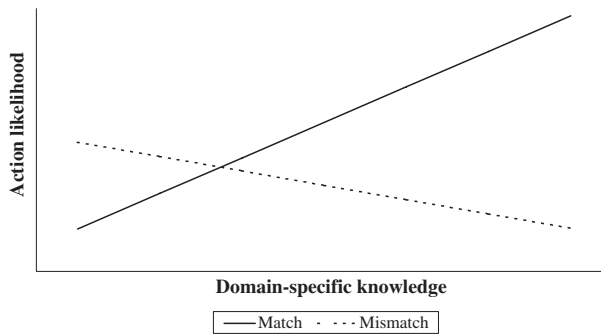
did not improve its fit (ΔR -square = 0.00; $p > 0.86$). None of the main effects were significant in that model. Adding the interaction of match and domain-specific knowledge in model 3 significantly improved the model (ΔR -square = 0.06; $p < 0.05$). The interaction term was positive and significant ($B = 0.38$; $p < 0.001$), suggesting that there was a moderation effect present. A plot of the effects of domain-specific knowledge on action likelihood under conditions of match and mismatch between learning style and situation illustrated the nature of the moderation, as shown in Figure 2. The crossed lines in the plot suggest that the effect of domain-specific knowledge on the action likelihood varies with the match or lack thereof between one's learning style and the situation at hand. When such a match exists, increase in one's domain-specific knowledge leads to increase in one's likelihood of acting on one's opportunity insight. This finding is consistent with the prediction of hypothesis (1) and thus provides support for it. On the other hand, when the match is lacking, increase in one's domain-specific knowledge leads to a lower likelihood of action. This provides support for hypothesis (2).

Discussion

In the midst of the strong interest in understanding how entrepreneurial opportunities are generated and developed, one question has remained unexplored: "Why do some

Figure 2

How the Match between Learning Style and Situation Moderates the Relationship between Domain-Specific Knowledge and Action Likelihood



people act on their insights while others find it comfortable to savor their ideas in an armchair?” In answering this question, this paper uses the perspectives of learning and entrepreneurial intentions in a complementary way. Specifically, in the context of viewing the emergence of opportunities as a learning process, it explores the intentionality that drives this process forward, from the initial occurrence of an idea to its further exploration and elaboration by a potential entrepreneur. The main finding of the paper is that this intentionality is driven by the interaction of individual and situational knowledge: Individuals’ prior knowledge of the opportunity domain increases their likelihood of acting on their initial opportunity insights only when their style of learning is compatible with the situation at hand. The paper thus contributes to the entrepreneurship domains of learning and intentions by enhancing their theoretical precision. The knowledge and learning habits of potential entrepreneurs, rather than being universally effective in the generation and development of opportunities through further action, are effective only in some situations and are detrimental in others. In the following paragraphs, I discuss the specific contributions in the context of the extant literature.

Opportunities and the Process of Learning

To the extent that opportunity development entails the use, creation, and elaboration of knowledge, it is a learning process. The main contribution of this study in this context is that it highlights the duality of learning content and process and further elaborates the role of the individual in this process. Knowledge, as the content of prior learning, and as a reflection of information asymmetries, may be necessary, but is not by itself a sufficient condition for explaining the development of one’s opportunity ideas. Indeed, in the current study, there was no effect of prior knowledge on the likelihood of action. Its effect was evident only once the individual’s learning approach was considered in a particular situational context. This resonates well with the emerging ideas that what matters is not just what one knows, but also what one does with this knowledge (Corbett, 2007; Ward, 2004). How people go about converting their insight experience into knowledge is an essential part of the individual-opportunity nexus (Venkataraman, 1997). In addition, while this aspect of an individual’s prior experience is more appropriate in some situations, it is less appropriate in others. Evaluating divergent, outside-the-box insights

requires a divergent, multiple-perspective learning approach for one to fully harness his or her domain-specific knowledge. Similarly, evaluating convergent, logic-driven insights requires a convergent, disciplined learning approach. When the insight and learning approaches are mismatched, more prior knowledge of the opportunity domain serves to pose more critical questions and to highlight dejecting uncertainties in the opportunity idea. It is this person-situation match that complements prior knowledge in explaining why some individuals are likely to act on their ideas while others are not.

Put in the context of recent studies on the role of prior knowledge on opportunity recognition (Corbett, 2007; Shane, 2000; Shepherd & DeTienne, 2005), the current study helps bring theoretical reconciliation and extension by drawing attention to the situations in which opportunity insights occur. It puts forth the overarching notion that the generation of opportunity ideas can occur in qualitatively different contexts and thus can involve different types of insight. Based on the information available to potential entrepreneurs on existing or emerging customer needs, and on products that can serve these needs, ideas are generated through convergent or divergent insights. These insights represent different starting points for the subsequent evaluation and interpretation of the ideas as they involve drawing different possibilities and inferences from the information at hand. It is interesting to note that the empirical contexts of the aforementioned studies correspond well to the notions of demand- and supply-driven contexts discussed in this paper. While Shane and Shepherd and DeTienne focused on prior knowledge of customers and markets (demand-driven context), the study by Corbett involved finding applications for a new technology (supply-driven context). This not only reinforces the context classification that this paper introduces, but also helps reconcile its results with these prior studies.

The current findings suggest that in demand-driven contexts, prior knowledge promotes intention only for people with divergent learning styles. While Shane (2000) did not explicitly study the learning styles of the case study protagonists, many of the opportunity ideas in the selected case studies were indeed based on divergent insights, as they pertained to applying the three-dimensional printing process from its original manufacturing domain to other, unrelated domains—creating architectural prototypes, creating artificial bones for use in surgery, making sculptures from photographs, manufacturing drug delivery systems, etc. In fact, since Shane studied only people that have taken the opportunity development process forward (i.e., they had all acted on their insights), it is possible that many people (convergent learners among them) had reviewed the technology and had come up with initial ideas, yet had failed to take those ideas forward. This reinforces this paper's idea that initial insights are examined further only when there is a person-situation match. In regard to the study by Shepherd and DeTienne, given that it focused only on the number of generated ideas and not on whether individuals were likely to act on them, there can only remain a speculation that the individuals using divergent learning were more likely to do so.

This paper also suggests that in supply-driven contexts, prior knowledge promotes intention only for people with convergent learning styles. The findings from Corbett's (2007) study reinforce this notion. He found that *comprehension* (as a mode of acquiring information that is a component of convergent learning; see Kolb, 1984) not only affected the number of identified opportunities directly, but also through amplifying the effect of specific human capital. In addition, he found that the combination of *apprehension* and *intention* (as modes of acquiring and transforming information that are the components of divergent learning; see Kolb, 1984) was ineffective for the identification of opportunities. Thus, only people with convergent learning abilities were effective in the supply-driven context induced by Corbett's study.

The idea that people with different learning approaches fare differently in a given situation is consistent with Corbett's (2005, 2007) notion of learning asymmetries, and thus it provides further credence to this idea. Different ways of acquiring and processing experience create diversity in the generation, evaluation, and further exploration of entrepreneurial opportunities. Accordingly, one's learning style—as evident through one's reliance on convergent or divergent learning—together with one's accumulated knowledge of particular domains, can be conceived as distinct features of one's entrepreneurial preparedness (Cope, 2005) as they reflect one's cumulative learning history, from upbringing through education to professional experience (Kolb, 1984). As the current paper shows, however, such preparedness is not universally instrumental, but is situated—it is effective only when the “right” context comes along. In many ways this echoes Pasteur's famous quote, “chance favours the prepared mind,” which we often use to explain the apparent serendipities in the entrepreneurial process. This suggests that individuals should not be decoupled from their action and learning context—their agency can be both enabled and impeded by the context.

From Entrepreneurial Intention to Opportunity Intention

The study contributes to our understanding of entrepreneurial intentions by highlighting their formation and realization in particular action contexts, i.e., in response to particular ideas. While prior studies have focused on the determinants of people's intention to start their own business (e.g., Hmieleski & Corbett, 2006; Krueger et al., 2000), this study focused on the predictors of specific intentions, given that a more general entrepreneurial intention is already present. The demonstration that people that are entrepreneurially inclined are not equally likely to act on a specific opportunity suggests that there is room for a more precise construct, *opportunity intention*, that pertains to specific, situated action. Opportunity intention, as a component of the more general construct of entrepreneurial intention, is the driving force of the opportunity development process, and it influences how this process unfolds by directing the (potential) entrepreneur's attention, experience, and action (Bird, 1988).

In addition, this paper highlights the situational contingency of perceived feasibility, as it relates to opportunity intention. Rather than being a belief that is exogenously given and stable for the individual in question, it is situationally dependent, emerging from the learning interaction between individual and context in generating and interpreting a particular opportunity idea.

Limitations

There are also several limitations to the study. In regard to its internal validity, while the selection of participants ensured their relative homogeneity in regard to personal factors exogenous to the model, there still remains a possibility of bias due to unobserved heterogeneity among the participants. Some of the possible unobserved characteristics include entrepreneurial intentions, self-efficacy, and risk propensity. Including these in future research on the topic would increase the theoretical and empirical precision of the study of this topic. Another limitation to the study concerns the generalizability of its results. Although some characteristics of the sample in the experiment (e.g., age, gender, experience) make them representative of the broader population of nascent entrepreneurs, there are certain biases in the sample that have been specially induced in order to facilitate testing the internal validity of the model. In particular, these biases pertain to the choice

of MBA students, particularly their personal and human capital characteristics, and the choice of the enterprise management software industry. Experiments in general are designed to communicate to theory rather than to directly generalize their results to broader populations (Zelditch, 1969). Nevertheless, in order to gain greater confidence in drawing population-level inferences, the questions of whether the findings apply to a population beyond that of graduate business students and to different industry contexts remain valid. These suggest important avenues for future research in terms of replicating the research design in different participant and industry settings.

Conclusion

More generally, this paper reinforces the importance of the intersection between learning and entrepreneurship by showing that the individuality of learning and its situated nature play key enabling roles in the formation of opportunity intentions. Even if equally motivated toward entrepreneurial achievements, individuals differ not only in the nature of ideas they generate in a particular situation, but also in the perceived feasibility of these ideas. In addition, it also bridges the different ontological traditions in which the study of opportunities is currently based. In a positivist spirit, it outlines the systematic components of the process, as represented by the interaction between knowledge, learning style, and insight situation. On the other hand, in a constructivist spirit, it suggests and allows that the content of an idea is a matter of individual interpretation and varies across both individuals and situations. Finally, this paper shows that integrating individual and situational factors in the study of entrepreneurial learning adds an important dimension to our understanding of opportunity development as a learning process. Knowledge can be both an enabling and constraining factor in opportunity development once we consider the nature of the learning interaction between a person and his or her specific situation.

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