Guest editorial

Dynamic entrepreneurial cognition: current trends and future opportunities

The psychological approach to entrepreneurship focuses on the reasons why certain individuals become entrepreneurs and why some entrepreneurs are more successful than others (Baron, 2004). While much of the work in this area has focused on cognitive dimensions internal to the entrepreneur, we posit in this special issue that creating a new venture that can survive, grow and stay competitive calls for a deeper understanding of the entrepreneur's cognitive state in conjunction *with* their environment. The purpose of this special issue therefore was to encourage entrepreneurial cognition scholars to use more dynamic cognition theories to examine entrepreneurs' mindset. We define dynamic cognition, as simultaneous, ever-evolving and context sensitive thinking. Such a definition is consistent with a modern view of human cognition where cognition is viewed as multilayered and interconnected and information is processed in parallel (see Foti *et al.*, 2008). This approach contrasts with the classic model of cognition as a form of digital computation, where symbolic representations are governed by rule-based manipulations unconstrained by the contextual environment (Eliasmith, 2009). In what follows, we will first selectively review the entrepreneurial cognition literature through a dynamic cognition lens, suggest future research opportunities and end with a review of the papers presented in this special issue.

Dynamic entrepreneurial cognition

Mitchell *et al.* (2011) suggest that dynamic views on entrepreneurial cognition can be usefully reinterpreted through a socially situated cognition (SSC) perspective (see Smith and Semin, 2004), to better understand the impact of the social context on the thinking of entrepreneurs (see Busenitz and Lau, 1996; Krueger, 2000; McGrath and MacMillan, 1992; Mitchell *et al.*, 2000, 2002). Building on previous work (i.e. Mitchell *et al.*, 2011; Randolph-Seng *et al.*, 2014; Randolph-Seng *et al.*, 2015; Smith and Semin, 2004), we highlight the opportunities that may come from viewing existing entrepreneurial cognition research through the dynamic lens of socially situated cognition. In the following sections, therefore, we examine the contributions of dynamically based entrepreneurial cognition research.

According to the SSC approach to entrepreneurship (Mitchell *et al.*, 2011, 2014a), entrepreneurial cognition consists of four themes: action-oriented, embodied, situated and distributed. The action-orientated theme suggests that cognition acts as a tool to sustain social action and "mental representations may be observed in a perceiver's positive or negative evaluation of, or motivation toward, an object or concept" (Mitchell *et al.*, 2011, p. 774). The embodied theme proposes that bodily states and the physical brain influence cognition. The situated theme argues that individual cognition is positioned within the collaborative communicative relationships with others, including involvements in social groups. Finally, the distributed theme contends that cognition is spread across various social actors and tools in the natural world (see Smith and Semin, 2004).

As we outline in the following sections, we propose that the SSC view can add value to the study of entrepreneurial cognition. We explain how the approach can unify past, present and future work on entrepreneurial thinking by providing order to the literature. While previous work (e.g. Mitchell *et al.*, 2007) organized the field of entrepreneurial cognition according to

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diverse theoretical approaches, we suggest this updated perspective can bring the different theories together into a unified whole. We also show how the SSC approach can encourage new research streams in entrepreneurship. Genetic-based research on entrepreneurs' thought processes, for example, naturally flows from the embodied theme. The SSC perspective can also have practical implications by informing the development and training of future real-life entrepreneurs. Creating a new venture that can survive, grow and stay competitive requires context sensitive cognition given the fluid, ambiguous and ever-changing nature of entrepreneurial environments. Being able to understanding and map these complex cognitive processes in successful entrepreneurs, for example, may allow future venture creators and those who work with and train entrepreneurs to understand how entrepreneurs can become most successful.

Applying a socially situated approach to current entrepreneurial cognition research

Various entrepreneurial cognition studies implicitly and explicitly demonstrate the potential in focusing on the themes (i.e. action-oriented, embodied, situated and distributed) of SSC for understanding entrepreneurial thinking. Next, we review some examples of these studies by organizing them according to these four themes, beginning with the action-oriented theme of socially situated cognition.

Researchers have shown elements of action-based cognition by suggesting that metacognition plays a significant role in the behavioral adaptability needed when facing an uncertain task environment (Haynie *et al.*, 2010) and that entrepreneurs' images of their capabilities and vulnerabilities combine with their situated images of opportunities to effect action (Mitchell and Shepherd, 2010). Further, in a controlled experiment, researchers found that individuals acted to create more opportunities depending on the situated conditions of cognitive uncertainty (Mitchell *et al.*, 2012). In terms of theory development in the area, Cornelissen and Clarke (2010, p. 552) emphasize that sensemaking in language is action-oriented through a "process by which individuals construct meaning while speaking." The situated activity of speech and communication; therefore, shapes cognition itself. Similarly, Wood *et al.* (2012, p. 207) created an "integrative model of the cognitive processes that foster entrepreneurial action." Other theorizing in the area has incorporated dynamic cognition by suggesting how cognitive elements change action across time (Eliasmith, 2009). Overall, incorporating action into entrepreneurial cognition research supports the ontological idea that "mind is much more a matter of what we do within environmental and social possibilities and bounds" (van Gelder, 1995, p. 380). Next, we review some examples of studies that can be organized around an embodied theme.

Embodiment has recently been a focus in the entrepreneurial cognition literature. Utilizing a field experiment, for example, Mitchell and Shepherd (2012) showed that knowledge codification in entrepreneurial contexts requires the physical recoding of information rather than only speaking out loud and influences whether the knowledge is shared, hence linking the physical body to the brain. In another steam of "embodied" cognitive work, research has shown how entrepreneurs' genetics are connected to their inclination to engage in entrepreneurial actions, including in terms of sensation seeking tendencies (Nicolaou *et al.*, 2008) gender difference (Zhang *et al.*, 2009) and identity (Kasperova and Kitching, 2014). Baucus *et al.* (2014) have utilized work done in neuroscience and neurophysiology to understand entrepreneurs' brains. These researchers theorize that physical structures of entrepreneurs' brains are different in ways that facilitate entrepreneurial experiences. In addition, in line with physical addictions to work and the Internet, Spivack *et al.* (2014) found that habitual entrepreneurs may be actually addicted to continually engaging in the process of entrepreneurship. Beyond a sole focus on the individual entrepreneur, Clarke *et al.* (2019) have recently illustrated how the physical gestures that entrepreneurs use to accompany

their speech can help investors to better understand the entrepreneur's ideas. Together, these studies that implicate embodied cognition propose that entrepreneurial thinking and the thinking of those around them can be viewed as being affected by different states of the physical body. Next, we examine approaches that are implicitly or explicitly based on the notion of situated entrepreneurial cognitions.

In terms of the situatedness of cognition, entrepreneurial thinking has been shown to be influenced by their level of social networks and relational capital a high level of which can increase entrepreneur's illusion of control, and in turn help the development of the new venture (De Carolis *et al.*, 2009). Others have also maintained that individual socialization can directly lead to the development of an entrepreneurial identity and entrepreneurial intentions (Falck *et al.*, 2012). Although Haynie *et al.* (2009; 2010) emphasized metacognition as an important aspect of processing feedback in a dynamic environment, they also observed that higher metacognitive capacities are associated with better adaption to situational changes in tasks (Haynie *et al.*, 2012). The concept of entrepreneurial alertness has also been related to situational features such that situated perception "mediates between changes in the environment and the discovery or creation of opportunities to act" (Valliere, 2013, p. 433). Even entrepreneurs' optimism has been shown to be situated by being directly related to the business growth of the venture (Wood *et al.*, 2015). Finally, in an agent-based simulation, that modeled the interactive probabilities among internal cognition and external situations like exchange formation, a greater percentage of variance was explained by external-based social situations than internal-based cognitions (Mitchell *et al.*, 2014b, 2012). Overall, research and theory in this vein demonstrates that, "cognitive activity routinely exploits structure in the natural and social environment" (Robbins and Aydede, 2009, p. 3). Thus, entrepreneurial cognition and action in social situations connects the person within a situation with their thinking and motivation (Fiske and Taylor, 1984).

In the final part of this subsection we will look at perspectives that are congruent with the distributed theme. Distributed cognition has been shown to be involved in failed ventures such that, "a given sentiment can spread throughout an organization, reinforcing itself each step of the way (resulting in) a collective belief" (Royer, 2003, p. 6). West (2007) discusses the need to examine cognition in the setting of the founding team since collective cognition may influence action differently than individual cognition. Similarly, Corbett *et al.* (2007, p. 829) show how corporate entrepreneurs use "three types of termination scripts" and the choice of script is determined by collective learning in the organization. Other research has shown how founding teams respond to knowledge gaps arising from surprises according to the team's transactive memory system (TMS) such that, "strong TMSs are less inclined to acquire external knowledge but are more prone to improvise in response to surprises than founding teams with weak TMSs" (Zheng and Mai, 2013, p. 197). Finally, Corbett (2014) proposed the idea of "entrepreneurial growth cognitions — the mental representations of how groups of entrepreneurs can develop rapid, big-growth-oriented firms right from the start" (Corbett, 2014, p. 398). In summary, the previously mentioned work demonstrates how the SSC perspective may help to organize diverse explanations for entrepreneurial cognition theory and research. In the next section, we offer potential avenues for future theory development and research.

Future directions for dynamic entrepreneurial cognition research

Looking at the research to date, opportunities for future research on these four aspects of SSC remain and below we present some ideas on how work on these themes can be further extended. As we have shown above the four SSC themes (i.e. action-oriented, embodied, situated, distributed) are present in theory and research related to entrepreneurial cognition. However, there is little research that draws on multiple aspects of the SSC framework

therefore there is ample opportunity to develop research projects that explicitly link the four SSC themes. In the next section, we further discuss the themes of SSC in terms of future research moving toward a more dynamic and integrated view of entrepreneurial cognition.

Situated. Regarding the impact of the social context, "one's rationality depends at every point on the complex causal and informational structure of the empirical world; and that rationality is firmly embedded in the world outside the mind" (Millikan, 2009, p. 181). Based on our review, an opportunity to clearly define what part of a context is perceived as within and outside the entrepreneurial mind remains. Such an understanding seems to be important for developing further insights into the entrepreneurship process given that research has found the outer context's possible impact on entrepreneurial exchange formations (Mitchell *et al.*, 2014a). Research in this vein may be able to provide new insights into when socially embedded vs socially constructed opportunities are harvested from a certain context (cf. Morse *et al.*, 2007).

Action-oriented and embodied. Regarding action and embodiment, Gardner (1983, 1993) stated that IQ was only one facet of intelligence. Intelligence was conceptualized as being more specific than general IQ; for example, musical, linguistic and spatial intelligence (Gardner, 1983). In particular, spatial cognition can be subsumed under the SSC perspective, and Tversky (2009) theorizes that cognition is formed in part by the space our body takes up, the space that exists around our body, and the space that it takes to navigate in our environments. We argue the theoretical framework of spatial cognition will likely provide a deeper understanding of the thought processes entrepreneurs engage in when executing their craft. Successful entrepreneurs, for example, may navigate physical space in unique and novel ways which may even extend to the virtual space they interact with on the Internet.

Action-oriented, embodied and distributed. In terms of action, embodiment and distribution, "consciousness is the operation of the plan-executing mechanism, enabling behavior to be driven by plans rather than immediate environmental contingencies" (Bridgeman, 1992, p. 42). As such, consciousness in the body empowers action to be distributed across future tools in the environment and not just the immediate context. Consistent with these three themes of the SSC view, neuroethology theory combines the neurobiological laboratory findings with observational findings of behavior through the analysis of the wider frameworks of natural history, evolution and everyday behavior. As such, a promising approach may be to examine the actions and reactions of entrepreneurs in terms of the dispersal of physiological regularities across and between minds and bodies (see MacIver, 2009).

Integration. When viewed from the perspective of the SSC themes, more traditional perspectives applied to entrepreneurial cognition have different focuses within one or more of the four themes as shown above. For instance, heuristics-based views may be considered in the context of the situated theme, as the approach examines how individuals in specific circumstances use decision shortcuts (see Busenitz and Barney, 1997). Alertness views may be considered in the context of the situated theme as well. In various contexts, for example, individuals with relevant entrepreneurial knowledge bases are better able to identify previously unseen entrepreneurial opportunities (cf. Valliere, 2013). In addition, expertise views are at the junction of distributed, situated and action themes in terms of deliberate practice in specific situations with experts (Baron and Henry, 2010; Mitchell, 2005). The effectuation view contains both the action and distributed themes, as the emphasis is on acting on relevant possibilities, given the human and other resources available (Sarasvathy, 2001). Action views (e.g. McMullen and Shepherd, 2006) contain both the situated and action themes, as action is thought of requiring a minimum of two rudiments: the inner (the goals) and the outer (the situation) aspects (Simon, 1990; Mitchell *et al.*, 2014b). Finally, affect views

contain the situated, embodied and action themes, due to the role of the body and situation on entrepreneurial behavior (e.g. Baron, 2008).

To further expand dynamic views within the study of entrepreneurial cognition, the concurrent development of broad conceptions of entrepreneurship are needed. For instance, entrepreneurial cognition could be linked to theories of entrepreneurial opportunity, in terms of individuals creating opportunities (Mitchell, 2003). As such, the thoughts of entrepreneurs are not only about perceiving possible business opportunities but also about restructuring a current context to produce a new opportunity. Next, we recommend different ways to apply the dynamic foundation of SSC to the study of entrepreneurship. Although not meant to be exhaustive, the following recommendations are explanatory by creating possible directions for future research.

First of all, using previous entrepreneurial cognition theory and research, investigators could demonstrate how this past work may be expanded according to an action, situated, embodied and distributed approach. Valliere (2013), for example, argued that environmental and cognitive aspects of the entrepreneur may create situated attention. In addition, investigators may choose to adopt aspects of the SSC view for wider use in entrepreneurship research. Nicolaou *et al.*'s (2008) work, for example, has applications to embodied cognition, but does not clearly connect entrepreneurial thinking to embodiment.

Furthermore, we argue that investigators could concentrate on comparisons of entrepreneurial communicative situations. For example, we consider changes in beliefs to be telling, as they suggest that interdependence among the person and the current communicative environment could be the link needed to describe the creation of entrepreneurial identity, intentions and opportunities (Felin and Zenger, 2009; Mitchell and Shepherd, 2010). Such processes can be seen, for instance, when entrepreneurs present their ideas to different people in order to acquire resources and form exchange relations (Clarke *et al.*, 2019; Cornelissen and Clarke, 2010).

We recommend that researchers not only focus on the impact of context on cognition but also concentrate on the interdependence among entrepreneurs and their social context; opportunity creation (e.g. Alvarez and Barney, 2007), such as the creation of new industries, may be a good example. We believe that adapting such a dynamic socially situated view will move research away from the "language and metaphor of the 'storage' and 'retrieval' of representations," to "conceptualize representations as states that are constructed online in specific contexts" (Smith and Semin, 2004, p. 134). Finally, we embrace the contention that entrepreneurial cognition researchers may employ the SSC approach to help examine the interdisciplinary views (see Grégoire *et al.*, 2011) that have not traditionally been a focus of the literature. Within that context, future investigators may amalgamate theory and research from SSC with theory and research from supplementary disciplines to offer innovative insights in theory and research on entrepreneurship.

The SSC view (Smith and Semin, 2004) starts with the foundation that "thinking is for doing", and that perception of the outside world is in accordance to how that world relates to the person. An entrepreneur's cognition, hence, can be explained per his/her previous experiences, not only in recognizing opportunities but also in the capacity to impact the existing markets (Garud *et al.*, 2002; Morse and Mitchell, 2005); and to create innovative operations for making unique market offerings (Felin and Zenger, 2009; Alvarez and Barney, 2007).

Current special issue

With the above review as an important backdrop, we will now introduce the articles in this special issue and discuss how this new research integrates into a dynamic view of entrepreneurial cognition.

First, Datta, Peck, Koparan and Nieuwenhuizen (this issue) investigate the cognitive and behavior dynamics of persevering in a new venture. The results indicted that affective commitment was the strongest predictor of continuing on with a startup when entrepreneurial responsiveness to opportunities in the changing environment overtime is ignored. When entrepreneurial responsiveness to opportunities overtime is included, however, it represents a direct antecedent, a moderator and a mediator to continuing on with a new venture. Interestingly, the same was not found with any of the commitment measures used. In terms of the SSC perspective, the results designate that perseverance in a new venture may have more to do with the action and situated cognitive aspects rather than the distributed and embodied cognitive aspects.

Second, Gonzalez and Winkler (2019, see erratum this issue) present a new theoretical model to better understand the role of entrepreneurial crises in the development of ventures; specifically, they conceptualize a new construct called entrepreneurial breaking point in order to identify how an entrepreneur may perceive and act to environmental threats. The model integrates the SSC approach with a stress approach in order to specify the complex interaction between the person and their environment, how an entrepreneur can vary in responding to stresses related to a venture, and how environmental stresses may be more successfully navigated. The paper provides an example of how the SSC approach can be combined with related disciplines in order to examine theoretical boundaries.

Third, De Winnaar and Scholtz (this issue) present a new theoretical model in order to better predict entrepreneurial decision-making in an uncertain business environment. The model integrates metacognition work in entrepreneurial cognition with cognitive theory outside of previous work done in entrepreneurial cognition in order to provide a more naturalistic bases for decision-making and to put entrepreneurial decision-making failure into context. The paper provides an example of how infusing elements of the SSC approach into theory can provide theory that is more applicable to dynamic and uncertain real-world environments.

Fourth, Raza, Muffatto and Saeed (this issue) examine the relationships between entrepreneurial cognition, behavior and environments that exist in 49 different countries. The results indicated that having a high degree of entrepreneurial cognition alone was insufficient for innovative entrepreneurial behavior to emerge. The deciding factor was the environmental contexts found in the various countries studied (e.g. intellectual property rights, business freedoms, institutional collectivism). In terms of the SSC approach, the results designate that innovative new ventures may first depend on the situated and distributed cognitive aspects being favorable before the embodied and action cognitive aspects can support innovative behavior in the real-world.

Finally, Thomas, Randolph and Marin (this issue) investigated entrepreneurship within two different corporate contexts in order to compare alterations between social networks and organizational cognitive processes. The results indicated differences between the two companies analyzed such that different corporate entrepreneurship types required specific dynamics in terms of context and cognitive processes. Within the setting of the SSC approach, the results designate the dynamic interaction that exists not only between individual entrepreneurs but also between institution that are attempting to engage in entrepreneurial activity. As such, the level of analysis further complicates the relationship between entrepreneurial thought and behavior.

Understanding why people become entrepreneurs and either succeed or fail in that pursuit is important not only for researchers in the area but also for society as a whole. As such, we have argued that creating a new venture that can endure, expand and compete requires a thoughtful understanding of the creator's cognitive state in combination with the situation. We hope that the above review and the papers that follow will help in that

understanding by encouraging dynamic approaches in the study of entrepreneurs' mindset.

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