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ABSTRACT

In this brief introduction we reflect on the diversity of studies connecting cognition to innovation, and the enormous potential that exists for further research. Research streams on cognition in organizations, innovation in organizations, and intra- and entrepreneurship, have developed in parallel over the past decades, with frequent touchpoints, notably in terms of theories of cognition informing studies on the processes of innovation and creativity. Cognition theories have thus been considered micro-foundations of many theories of innovation. Here we outline the many ways that theories of cognition can yield insights for studies of innovation, and discuss the contributions of chapters comprising this third volume of *New Horizons in Managerial and Organizational Cognition*.

Keywords

Managerial and organizational cognition; Innovation; Creativity; Biases; Sensemaking

Advances in the Study of Cognition

The study of cognition in and around organizations has advanced considerably over the past thirty years. Taking inspiration from earlier studies of social psychology, organizational and management scholars laid the foundations during the 1980s and into the 1990s for the modern domain of managerial and organizational cognition (MOC) (see e.g. Walsh, 1995). What emerged was a new view of strategic decision-making that complemented the dominant industry and resource-based views. The knowledge-based view (Grant, 1996; Nonaka & Takeuchi, 1995) also emerged around this time, but where the unit of analysis in this view is knowledge or information, the processes that lead to or interfere with the creation of knowledge are the realm of MOC studies. The knowledge-based view paved the way for the study of how innovation emerges and spreads. Similarly, the cognitive perspective paved the way for the study of how the individual and shared knowledge structures in organizations are formed and disseminated, and how decisions about what and how to innovate are shaped by the way we think (Glynn, 1996), in addition to external forces.

The early focus of MOC studies centred on theories of interpretation, according to which managers are "information workers" (McCall & Kaplan, 1985; Sund, 2015), collecting, handling, and interpreting information from and about the external environment on behalf of the organization (Daft & Weick, 1984), often under conditions of uncertainty (Huff et al. 2016; Milliken, 1987, 1990; Sund, 2013, 2015). Such information processing is guided by and creates constructs defined as knowledge structures, mental maps, templates (Walsh, 1995), and schema (Bartunek, 1984). Empirical work in this tradition has focussed on revealing and analysing subjects' explicit representations of knowledge, through methods

such as repertory grid analysis, taxonomic mapping based on interviews, and causal mapping (e.g. Eden & Spender, 1998; Fiol & Huff, 1992; Huff, 1990; Hodgkinson & Healey, 2008; Walsh, 1995). Common to such methods is that they focus on what can be referred to as "conscious" and "cold" cognition (Hodgkinson and Healey, 2011; Hodgkinson, Sund, & Galavan, 2018), i.e. rational thoughts of which we are aware and can process in the absence of emotion.

Over the past two decades, studies of both hot cognition, i.e. cognition under conditions of high affect, and automatic, unconscious cognition, have emerged in organizational research, and have extended the limits of how we understand the role of cognition in organizations and decision-making. Informed by dual-process theory we now see studies examining how the aspects of our thinking that we do not entirely control or are not entirely aware of, influence our decisions (e.g., Chaiken & Trope, 1999; Epstein, 1994; Kahneman, 2011; Sloman, 1996; Smith & DeCoster, 2000). Studies of, for example, subconscious goals, implicit attitudes, and implicit affect, have broadened our understanding of human decision-making and shown it to be more complicated than we previously imagined (Hodgkinson, Sund, & Galavan, 2018). New empirical research methods such as those offered by neuroscience (e.g., Massaro, 2017; Laureiro-Martinez, 2018; Laureiro-Martinez et al, 2015), or agent-based modelling (e.g., Healey, Bleda, & Querbes, 2018; Miller, 2015) can now complement more traditional interview methods (e.g., Vuori, 2018), experimental methods (e.g., Reypens & Levine, 2018), and survey methods (e.g., Sund, 2016), in opening up the potential to study emotions and unconscious biases in decision-making, including in studies of innovation.

Intersections between Cognition and Innovation

The study of innovation, that by some has been defined as "a new idea" (Van de Ven, 1986: 591) and by others as "the successful exploitation of new ideas" (Adams, Bessant, & Phelps, 2006: 22), is in itself not new. The concept of innovation has over time become ubiquitous and pervasive, to the point that, in various review articles scoping the literature on innovation, the term has been called a buzzword (Hidalgo & Albors, 2008) and the body of literature has been criticized for being inconsistent in its operationalization of key constructs such as the degree of innovation (Garcia & Calantone, 2002). Such criticism notwithstanding, there are today some widely accepted categories of innovation that can help us structure the field, and contextualize findings. The most typical ones are degree of innovation, type of innovation, level of analysis, and process stage.

Whilst there has been some debate about how to clearly differentiate between degrees of innovation, innovations are commonly categorized as either incremental or radical, or somewhere in between. It is also understood that novelty can be new to the firm, new to the industry or new to the world (Ahuja and Lampert, 2001). How such newness, or innovativeness, is conceived and measured varies enormously across studies. Christensen's (1997) related categorization of sustaining versus disruptive innovation has regained interest recently, thanks to a mass media and industry focus on digitalization trends. A second very common categorization concerns innovation type, where typical categories include product, service, process, technical/technological, administrative, or business model innovation. A third and fourth categorization can be thought of as the level of analysis, typically categorized as individual level, team level, organizational level, or industry level, and in the many studies looking at innovation as a process, the actual stage in this process, for example initiation

stage, idea generation stage, adoption stage, or implementation stage (Gopalakrishnan & Damanpour, 1997).

Closer to the aims of this volume, the interplay of cognition and innovation has been at the centre of a long and distinguished tradition at the interface between behavioural and social analyses, not least since the landmark work of March and Simon (1958). They managed to seamlessly interweave the social and behavioural elements of cognition, which subsequently separated into distinct conversations.

On the behavioural side, Nelson and Winter (1982) developed an evolutionary theory of the innovating organization built on the notion of 'routine' as quasi-genetic material that provides foundations to both stability and change. On this basis, a new paradigm of research in strategy emerged based on the notion of search (e.g. Levinthal, 1997) and problem solving (e.g. Nickerson and Zenger, 2004). Similarly, growing interest went in the direction of exploring issues related to attention processes and mechanisms related to the ability of switching across different learning strategies (e.g. Laureiro et al. 2015; Laureiro and Brusoni, 2018). The discussion about attention is particularly important because it provides a bridge between social and behavioural approaches to cognition and innovation.

Ocasio (1997) developed parts of the discussion opened up by March and Simon (1958) who had given attention a central role in their approach, an element that fell under the radar for many years. Ocasio built on the tradition of organizational sociology and institutional logics to give the concept of organizational attention flesh, bones and strategic relevance. In parallel, the concept of routine was also being modernized and reintegrated into the organizational context where it belongs by the work of Martha Feldman (e.g. Feldman,

2000), among many others. While routines came to be accepted as the tangible manifestations of organizational cognitive abilities and skills, the discussion about frames and identity also developed in ways very much consistent with the idea that organizations are institutions moved by social cognitive processes embedded in processes, structures, and routines. Kaplan (2008) developed this line of work looking at how different cognitive frames compete for primacy in organizations. Tripsas (2009) looked at identity as a major factor that explains which decisions firms take (or not) when exploring different and alternative technological trajectories.

The contributions in this volume

There is by now a rich, although still fairly small, literature studying innovation through cognitive lenses (e.g. Kaplan and Tripsas, (2008)). For example, it has been documented how a shared understanding of the existing business model directs the way executives perceive new ideas for business models in incumbent firms (Sund et al, 2016; Sund et al, 2014). Or that it is a combination of cognition and emotion that leads groups to adopt or not process innovations in large firms (Choi et al, 2011). Or that due to incongruence with existing schemata, innovation originating outside the firm leads managers to search for information on opportunities or threats (Greve & Taylor, 2000). These, and the many other studies that have been carried out over the years may appear to point in all sorts of directions. However, combining the ideas of cognitive dual-process with the various categorizations of innovation discussed earlier, provides us with a robust structure or framework for exploring the many contexts and research questions that could be found at the intersection of cognition and innovation. This is illustrated in figure 1.

Figure 1 about here

The studies in this collection all contribute, in their own ways, to this discussion. Some extend it in new directions, some add new building blocks to it. For example, one might wish to study how conscious, cold (emotion-independent) cognition affects the implementation stage of a new business model. In such a case, multiple theories of cognition could provide relevant insights. An example is found in Snihur, Thomas, and Burgelman's (2018) study in this volume, in which they examine how framing can constitute a strategic process that enables business model innovators to shape new ecosystems, involving a number of organizations.

Socio-cognitive processes often occur at the group or team level within the organization, in which case theoretical development may need to consider just how individual-level cognition constructs affect team processes. For example Zaman et al (2018) in this volume examine the implementation of a new technology among hospital workers (a form of process innovation), illustrating the role of interactive framing in the social process of adoption and diffusion of the innovation.

Over time, the discussion about innovation has been linked to that of leadership. For example, Mahdad et al (2018) in this volume looks at how leadership enables iterative cycles of sense making and sense giving in collaborative contexts at the interface between university and industry. Mammasis and Schmid (2018) also in this volume looks instead at the role of power in the context of innovation and change. They build on individual level studies of

power (a concept vastly underexploited in the innovation and cognition literature) to discuss how paradoxical leadership an important moderating factor on the negative relationship between power asymmetries and team performance.

The chapters by Zagorac and Marxt (2018) and Biehl et al (2018) go back instead to the analysis of the sources of innovation, to reframe (conceptually the former and empirically the latter) this long and distinguished conversation. They do so relying on the attention based view of the firm and on complementarities with the rich and vast literature on entrepreneurship (opportunity recognition). Biehl et al (2018) also explore the potential of new, computer enabled text analysis techniques to provide evidence about their reasoning.

Finally, the chapter by von Krogh et al (2108) sheds light on one of the great unknowns in the innovation and cognition literature: ethics. In their discussion, the build on practice approaches to organizing to explore how communities and groups deal with the varying requirements of formal and informal practices, and which moral dilemmas occur at their interface. They make their discussion concrete analysing examples from information system design.

An invitation to explore

This volume of New Horizons in Managerial and Organizational Cognition cannot illustrate all possible contexts of the presented framework, but we hope it gives sufficient exposure to the topic to encourage pushing the boundaries and exploring further, We extend an invitation to both the MOC and innovation management communities to embrace the theoretical and methodological opportunities that now exist for the study of cognition, in order to explore just how our thinking affects the way we develop ideas, and turn them into sustainable

businesses and business practices. The various papers comprising this volume cover such diverse topics as framing in business models, cognitive mechanisms in entrepreneurial opportunity identification, paradoxical leadership, and the role of management attention in radical product innovation. We hope that this collection will inspire many others.

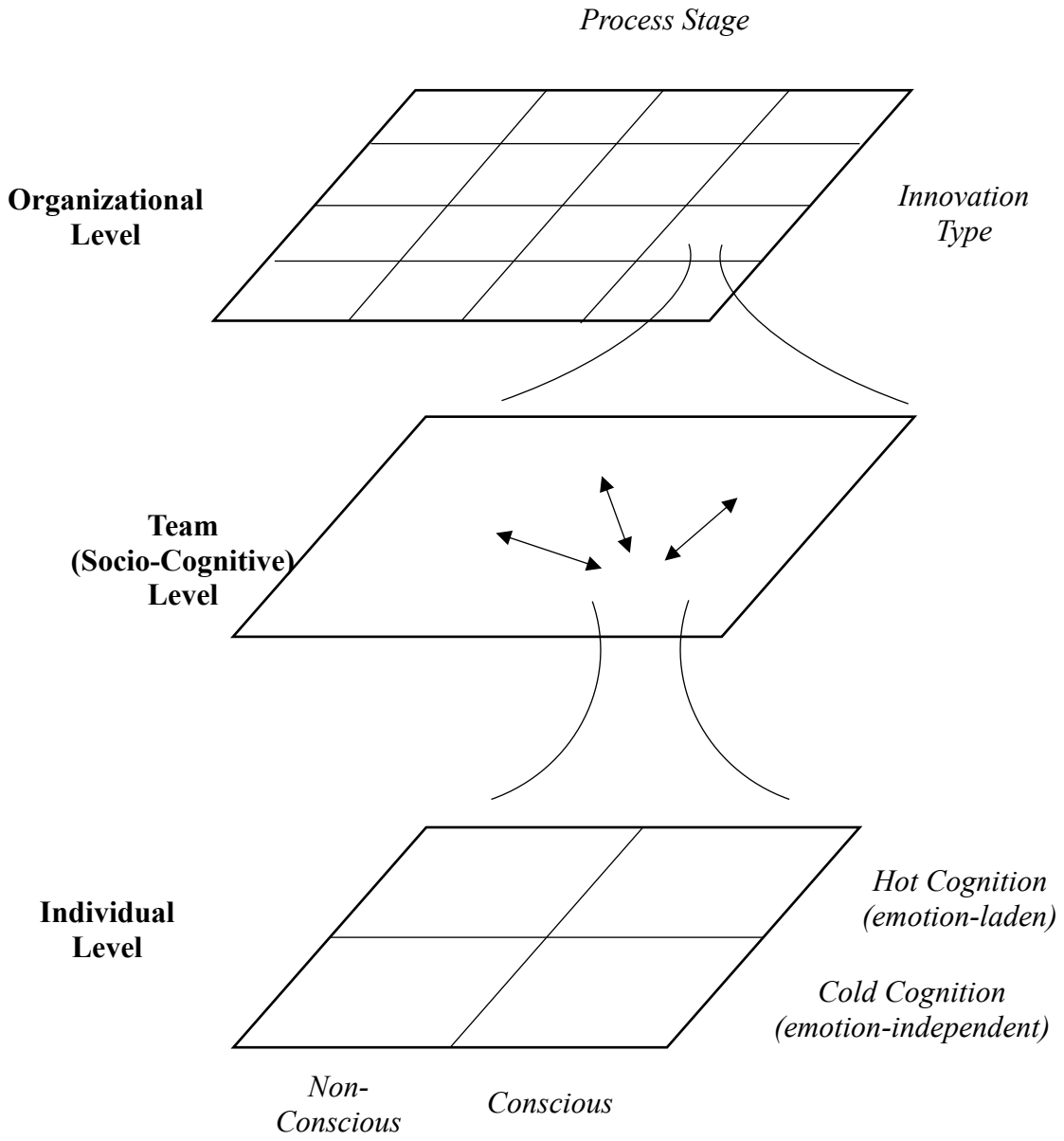

Figure 1: Framework for the study of cognition and innovation

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