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Gulsun Altintas

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# **Microfoundations of knowledge-based dynamic capabilities**

Gulsun Altintas

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## **Abstract**

Although knowledge-based dynamic capabilities literature argues that dynamic capabilities foster knowledge management activities, it does not explain how such fostering occurs. To answer this question, this study focuses on dynamic managerial capabilities, applying microfoundational analysis at the individual level to improve understanding of organizational phenomena. It focuses on three dimensions of dynamic managerial capabilities: the managerial abilities of sensing, seizing, and transforming; the psychological abilities of intuition and emotion; and the managerial characteristics of human capital, social capital, and cognition. The study makes three contributions. First, it shows that the microfoundations of dynamic capabilities generate knowledge management activities. Second, it demonstrates the link between managers' psychological abilities (intuition, emotion) and knowledge management activities. Third, it describes the role of sensing, seizing, and transforming in knowledge management activities.

## **Keywords**

Dynamic managerial capabilities, knowledge management, managerial abilities, psychological abilities, managerial characteristics

## INTRODUCTION

Because ‘The services rendered by tangible resources depend on how they are combined and applied, which in turn is a function of a firm’s know-how (i.e., knowledge)’ (Alavi & Leidner, 2001, p. 108), and because knowledge is the origin of the quality of tangible resources, it represents a key strategic resource. Firms acquire, manipulate, and apply knowledge to produce superior performance (Denford & Chan, 2011; Nonaka & Takeuchi, 1995; van Reijssen et al., 2015). Moreover, because knowledge-based resources are difficult to imitate and socially complex (Alavi & Leidner, 2001), they can sustain firms’ superior performance over the long term. The growth of the knowledge-based economy makes knowledge even more important, and organizations increasingly must acquire, integrate, and use new knowledge—that is, become knowledge-integrating (Garcia-Perez et al., 2020; Teece, 2000). According to Alavi and Leidner (2001, p. 109), knowledge is ‘a justified belief that increases an entity’s capacity for effective action’ that can be considered from several perspectives: a state of mind, object, process, condition for having access to information, or capability.

In this study, we consider knowledge as a process and seek to analyse knowledge management activities, or how companies create and share their knowledge, which is critical to gaining and sustaining competitive advantages (Denford, 2013; Grant, 1996; Nikitina & Lapina, 2019; von Krogh et al., 2001). Knowledge management is the process of creating value (Liebowitz, 1999) by identifying, developing, and leveraging knowledge in organizations (Alavi & Leidner, 2001; Easterby-Smith & Prieto, 2008). Thus, it comprises processes and practices that enable organizations to obtain stocks of knowledge (Hsu & Sabherwal, 2012; Wang et al., 2016). In turn, the concept of knowledge-based dynamic capabilities (KBDC) highlights the importance of knowledge in sustaining organizational performance in knowledge-based economies that experience unforeseen and innovative

demands (Bindra et al., 2020); it is ‘the ability to acquire, generate and combine knowledge resources to sense, explore and address environment dynamics’ (Zheng et al., 2011, p. 1037). To achieve obtain and maintain performance, managers also must assume entrepreneurial roles and orchestrate resources to build and transfer both productive and customer knowledge (Teece, 2016). The concept of KBDC emphasises that dynamic capabilities foster knowledge management activities such as knowledge generation, acquisition, and combination (Denford, 2013; Faccin et al., 2019; Zheng et al., 2011). However, due to the limited number of studies of the concept (Robertson et al., 2021), our understanding of precisely how dynamic capabilities foster knowledge management activities is restricted. We propose mobilising the microfoundations approach to analyse such activities, reflecting the importance of individual actors for creating and managing knowledge (Denford, 2013; Nikita & Lapina, 2019). Microfoundations analyses enable us to consider organizational phenomenon by focusing on individual actors and their interactions (Felin & Foss, 2005). Accordingly, we investigate dynamic managerial capabilities (Adner & Helfat, 2003; Helfat & Martin, 2015) as they relate to the role of managers/leaders in resource base transformations. By articulating both dynamic capabilities and knowledge management literature and formulating propositions, we highlight relationships between the microfoundations of dynamic capabilities and knowledge management activities, to support tests of them on a larger scale.

By theoretically examining the role of dynamic managerial capabilities in knowledge management activities, we also make three main contributions. First, we provide an analysis of KBDC by focusing on microfoundations. Second, we highlight the role of intuition and emotion in knowledge management. Third, we describe how the sensing, seizing, and transforming framework contributes to knowledge management. Thus, we begin with a review of KBDC and the microfoundations of dynamic capabilities. After we present a series

of propositions about microfoundations that foster knowledge management activities, we detail the three contributions to prior literature.

### **KNOWLEDGE-BASED DYNAMIC CAPABILITIES (KBDC)**

Research on KBDC is still scarce, and relatively few studies have addressed the subject. According to Robertson et al. (2021), the KBDC concept represents a synthesis of the knowledge-based theory of the firm (Grant, 1996), with its roots in the resource-based view (RBV) (Barney, 1991) and dynamic capabilities theory (Teece et al., 1997). Thus, it combines the views of both theories and highlights the importance of renewing organizational knowledge in a dynamic way. More precisely, KBDC entails acquiring, generating, and combining knowledge resources to sense, explore, and address environmental dynamics (Zheng et al., 2011). Studies show that KBDC can help organizations perform in highly competitive environments (Khaskar et al., 2020) and obtain competitive advantages (Nielsen, 2006; Robertson et al., 2021) through successful innovation, as the result of their acquisition and integration of knowledge (Robertson et al., 2021).

Dynamic capabilities can foster change and renew and exploit firms' knowledge-based resources (Nielsen, 2006). According to Denford (2013), the management of knowledge through dynamic capabilities also supports the development of new capabilities, depending on the nature of knowledge. If a dynamic capability focuses on externally sourced knowledge, it encourages the development of alliancing capabilities, but if it focuses on internal sources, it supports the development of R&D capabilities. Several studies also highlight the role of dynamic capabilities in knowledge management activities, though each study offers a different conceptualization of KBDC according to different knowledge management activities (see Table 1). Among these various conceptualizations, we focus on Zheng et al.'s (2011) typology of knowledge acquisition, generation, and combination, because it is relevant to our focus on the individual level. This typology illustrates knowledge

acquisition and/or generation by individual actors and the combination of knowledge to produce organizational knowledge—that is, the transition from individual to organizational knowledge. All three activities are essential to creating new organizational knowledge and obtaining competitive advantage. According to Zheng et al. (2011), knowledge acquisition consists of identifying and acquiring useful external knowledge. Individual actors also can generate knowledge, by developing and refining activities and processes that facilitate the creation or generation of new knowledge, and by combining knowledge—that is, integrating and applying both internal and external knowledge. Han and Li’s (2015) typology, which mobilises sensing and seizing of opportunities and transforming of resources, could be tautological with our framework, which uses managerial abilities related to sensing, seizing, and transforming.

**Table 1.** Typologies of knowledge management activities (adapted from Robertson et al., 2020)

<b>Authors</b>	<b>Knowledge management activities</b>
Nielsen (2006)	Knowledge creation, acquisition, capturing and articulating, assembly, sharing, integration and recombination, leverage, application, exploitation
Zheng et al. (2011)	Knowledge acquisition, generation, combination
Denford (2013)	Knowledge creating, integrating, reconfiguring, replicating, developing, assimilating, synthesising, imitating
Monferer et al. (2015)	Adaptation capability, absorption capability, innovation capability
Han & Li (2015)	Knowledge sensing capacity, knowledge seizing capacity, knowledge reconfiguring capacity

According to Han and Li (2015), since the KBDC concept first emerged, authors have explored its typologies, dimensions, and relationship with network embeddedness, knowledge management, and performance. However, even as several studies have focused on the

typologies of knowledge management activities, very few have investigated factors that generate these activities. For example, Bindra et al. (2020) cite intellectual capital, R&D intensity, absorptive capacity, and agility; other authors highlight the importance of dynamic capabilities by showing that they can generate knowledge management activities (Denford, 2013; Nielsen, 2006). None of these studies reveal the mechanisms through which dynamic capabilities foster such activities though.

Therefore, we focus on the microfoundations of dynamic capabilities, because understanding organizational phenomena requires understanding them at the individual level (Felin & Foss, 2005). Moreover, studies highlight the importance of managerial competence for creating and managing knowledge (Muhammed & Zaim, 2020; Nikita & Lapina, 2019; Schiuma, 2009). Knowledge is created by individual actors (Denford, 2013; Nonaka, 1994) and can become embedded within organizations through organizational processes and routines (Denford, 2013). Therefore, if dynamic capabilities foster knowledge management and if knowledge primarily is created and held by individual actors, it seems relevant to study and understand the role of microfoundations of dynamic capabilities in knowledge management. In turn, it is necessary to consider dynamic managerial capabilities that focus on individual and managerial activities (Teece, 2016).

## **MICROFOUNDATIONS OF DYNAMIC CAPABILITIES**

As indicated previously, to explain an organizational phenomenon, it is necessary to begin by understanding the individual actors who make up organizations (Felin & Foss, 2005). According to some authors, understanding collective phenomena such as routines or capabilities requires focusing on individual-level components such as choices, agency, characteristics, abilities, and cognition (Felin et al., 2012). Other authors argue that organizational phenomena are produced by intentional human action and interactions (Abbell et al., 2008; Felin & Foss, 2009; Foss, 2009). Barney and Felin (2013) emphasise the

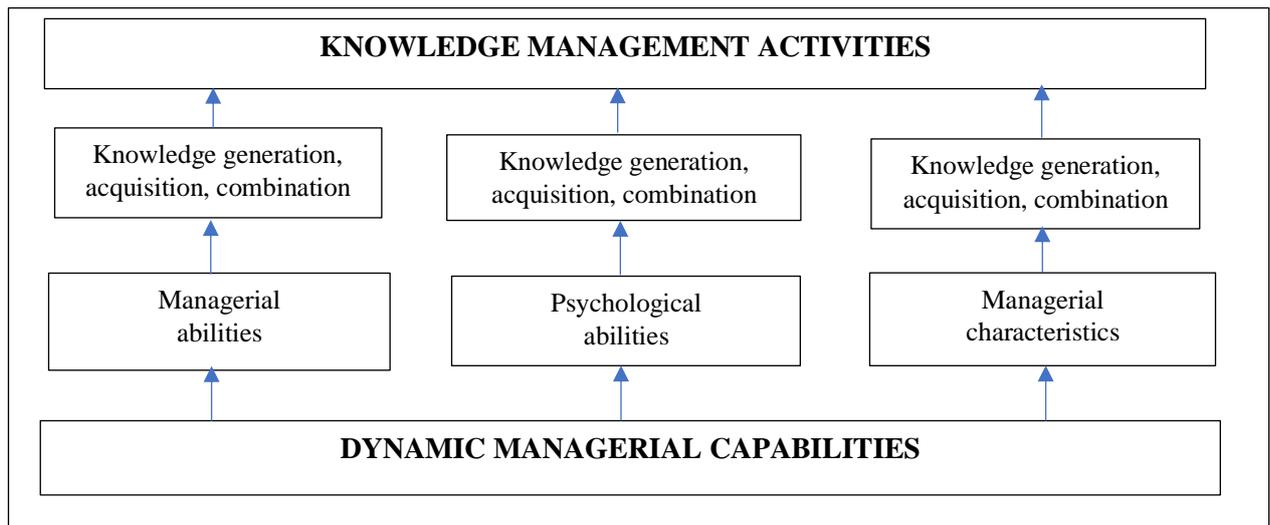
importance of interactions, indicating that microfoundations are not only about individual actors or adding individual actors but also about aggregating individual actors to generate emergent outcomes as the result of the knowledge of the constituent parts. Focusing on the individual level also has certain virtues in terms of understanding organizational behaviour and performance (Barney and Felin, 2013); the latter is explained by the talent of certain organizational actors (Foss & Lindenberg, 2013). Felin et al. (2012) define microfoundations with a regression method, such that a baseline microfoundation for level  $N$  lies at level  $N - 1$ . By moving down one level of analysis, we can identify the  $N - 1$  level of dynamic capabilities.

Adner and Helfat (2003) also suggest the notion of dynamic managerial capability, which they define as ‘the capabilities with which managers build, integrate, and reconfigure organizational resources and competences’ (p. 1012). A dynamic managerial capability view is a specific perspective within dynamic capability theory literature; it emphasises the role of managers/leaders in changing a firm’s resource base, in line with the environment (Adner & Helfat, 2003; Augier & Teece, 2009; King & Tucci, 2002; Zahra et al., 2006). Individual actors constitute microfoundations of capacities in two ways, through their (1) managerial characteristics and abilities and (2) psychological and behavioural characteristics (Felin et al., 2012). More precisely, dynamic managerial capabilities are characterised by three dimensions: managerial abilities, psychological abilities, and managerial characteristics. Managerial abilities refer to asset orchestration, that is, the sensing of new opportunities, the seizing of such opportunities, and the transforming of resource bases (Fainshmidt et al., 2017; Teece, 2007a). Even if some elements of dynamic capabilities are embedded in organizational activities, the ability to assess and prescribe changes in the resource base is a managerial skill. Dynamic capabilities refer to creative managerial and entrepreneurial activities that are strategic and non-routine, even though there may be underlying principles that guide choices

(Teece, 2012). Schilke et al. (2018) give a concrete example related to the development of new products, indicating that though new product development often takes place within a stable framework of recurring organizational processes, this process involves non-routine activities that refer to the exploration of new ideas by individual actors. Furthermore, dynamic managerial capabilities are composed of psychological abilities such as intuition and emotion (Hodgkinson & Healey, 2011; Huy & Zott, 2019). These abilities can improve the implementation of managerial abilities through better recognition of valuable knowledge and faster decision making (Ambrosini & Altintas, 2019). Finally, authors highlight individual-level antecedents such as the managerial characteristics of human capital, social capital, and cognition (Adner & Helfat, 2003; Helfat & Peteraf, 2015; Kor & Mesko, 2013). Human capital relates to the experience of managers and social capital results from relationships and connections (Kor & Mesko, 2013). Managerial cognition refers to the belief systems and mental models of managers (Prahalad & Bettis, 1986; Walsh 1995).

In summary, KBDCs are dynamic capabilities that foster knowledge management activities, which in turn foster knowledge acquisition, generation, and combination. In this paper, we seek to understand how dynamic capabilities foster knowledge management activities. To do so, we focus on dynamic managerial capabilities at the individual level; specifically, we focus on three dimensions of dynamic managerial capabilities (see Figure 1): managerial abilities, psychological abilities, and managerial characteristics. We analyse how these three dimensions of dynamic managerial capabilities foster knowledge generation, acquisition, and combination.

**Figure 1.** Microfoundations of knowledge-based dynamic capabilities



## **MICROFOUNDATIONS OF DYNAMIC CAPABILITIES IN KNOWLEDGE MANAGEMENT ACTIVITIES**

We next integrate our synthesis of literature and suggest how managerial (sensing, seizing, and transforming) and psychological (emotion and intuition) abilities and managerial characteristics (cognition, human capital, social capital) foster knowledge management activities (see Table 2).

### **Role of Managerial and Psychological Abilities in Knowledge Management Activities**

The concept of dynamic managerial capability emphasises the entrepreneurial perspective of dynamic capabilities. Beyond managers' operational activities such as control, supervision, and administration to ensure the coordination of activities, dynamic capabilities theory relates to managers' strategic and entrepreneurial functions (Teece, 2007b), which are essential in turbulent environments. From this perspective, managers' roles are entrepreneurial (Augier and Teece, 2008; Teece, 2007a, 2007b; Teece, 2016), and firms that have strong dynamic capabilities are those that are intensely entrepreneurial. Such companies not only adapt to their environments but also adopt proactive behaviours to influence the environments they operate in through innovation and collaboration with other firms, entities,

or institutions (Teece, 2007a). In this sense, the fundamental strategic function of managers is to orchestrate organizational assets (Augier & Teece, 2008; Teece 2007a).

According to Teece (2007a), such orchestration requires three managerial abilities: (1) sensing new opportunities by scanning the environment to collect information (Kump et al., 2019), (2) seizing these opportunities through the exploitation of market opportunities by bridging external and internal information (Kump et al., 2019), and (3) transforming resource bases, characterised by change. According to Kump et al. (2019), new information represents potential change; some studies indicate that flow of information allows the creation of new knowledge (Nonaka, 1994). The three abilities generate information gathering (Teece, 2007a) and thereby foster knowledge management activities. Furthermore, psychological abilities such as emotion and intuition (Hodgkinson & Healey, 2011, Huy & Zott, 2019) can improve managerial abilities. Because managerial abilities allow information gathering and knowledge creation and psychological abilities improve managerial abilities, we argue:

***Proposition 1:** Managerial and psychological abilities foster knowledge management activities.*

**Sensing Opportunities.** Managerial sensing capacity is ‘the capacity of an individual manager to identify opportunities for organizational innovation’ (Roberts et al., 2016, p. 48). Two access factors influence a manager’s ability to sense opportunities (Teece, 2007a), namely, access to existing or to new information. Having access to information requires scanning activities; firms survey new technologies and markets to sense opportunities for technological change and customers’ latent demands. Other information access mechanisms include information systems (Roberts et al., 2016), though information alone is not enough to sense opportunities that involve creating, learning, and interpreting activities; the identification of new opportunities also requires managers’ cognitive and creative abilities (Teece, 2007a). Cognitive ability refers to ‘managerial ability in searching, encoding,

structuring and recalling salient information that is used proactively for influencing firms' strategic directions' (Pandza & Thorpe, 2009, p. 122), and creative ability consists of searching for opportunities and integration of the knowledge necessary to explore the recognized opportunities (Pandza & Thorpe, 2009; Teece, 2007a). Two cognitive characteristics facilitate the identification of opportunities: perception and attention (Helfat & Peteraf, 2015). Perception is the construction of useful and meaningful information about a specific environment; it promotes the identification of opportunities through the recognition of emerging patterns in the environment and interpretation of data relating to these patterns. Attention facilitates analyses of the environment by focusing on a relevant stimulus. Ultimately, when managers' sensing capacities are high, they can continuously and reliably acquire and interpret strategically relevant information in their environments (Kump et al., 2019). Because information is defined as 'that commodity capable of yielding knowledge, and what information a signal carries is what we can learn from it' (Nonaka, 1994, p. 15), sensing opportunities can generate knowledge through strategic gathering and interpretation of relevant information that emanates from the environment. According to Nonaka (1994), knowledge is created and organized by the flow of information and is anchored to the commitment and beliefs of its holders; it originates from and is applied in the minds of knowers (Baskerville & Dulipovici, 2006). Moreover, knowledge resides in the living mind; a person must identify, interpret, and internalise knowledge (Baskerville & Dulipovici, 2006). Therefore, sensing capacity is the origin of individuals' capacities to absorb, which Lowik et al. (2017) cite as a key microfoundational factor of organizations' capacities to absorb. Such capacities refer to the identification and acquisition of external knowledge and its integration into internal knowledge through transformation and exploitation (Zahra & George, 2002). Therefore, we argue that sensing capacity can generate new knowledge (Nielsen, 2006; Zheng et al., 2011) through information gathering achieved by scanning activities and information

systems, and this information can be transformed into knowledge as a result of interpretation efforts by managers, achieved through their cognitive and creative abilities:

***Proposition 1a:** Managerial capacity to sense opportunity fosters knowledge generation through cognitive and creative abilities.*

According to Hodgkinson and Healey (2011), the ability to update mental representations (i.e., mental schemas and cognitive maps) in response to changes in the external environment is essential for identifying opportunities. Managers must be able to incorporate intuition into the process of identifying opportunities. In some strategic situations, they must make decisions about assessing emerging opportunities or threats relatively quickly, such that data recognition and interpretation patterns may prove insufficient, whereas intuition may provide strong, implicit knowledge.

In prior literature, authors defined intuition in different ways. According to Jung (1933, cited in Dane & Pratt, 2007), intuition is a psychological function that transmits perceptions unconsciously. It is not an irrational process but is based on a deep understanding of situations (Khatri & Ng, 2000). Intuition is a complex phenomenon that taps into the store of knowledge found in the subconscious and is rooted in experience (Khatri & Ng, 2000). It relies on an innate ability to synthesise information quickly and efficiently—an ability that can be hampered by more formalised procedures (Dane & Pratt, 2007).

According to Epstein et al. (1996), when managers include intuition in decision making, the process is automatic, preconscious, holistic, associative, mainly non-verbal, and closely linked to affect. Generated by emotional reactions, intuition induces speed in situation assessment (Biswas, 2009), mainly in complex situations (Schul & Mayo, 2003), leading managers to resort to heuristic processing (Epstein et al., 1996). However, Hodgkinson and Healey (2011) point out that relying on intuition is not always right; its use is appropriate only when there is sufficient environmental regularity and recognition of the signs that signal using

intuition is the way forward. Because having intuitive ability in complex situations can lead managers to acquire the most relevant knowledge more rapidly, we argue:

***Proposition 1b:** Managerial sensing capacity that includes intuition fosters knowledge generation in complex situations through the rapid acquisition of relevant knowledge.*

**Seizing Opportunities.** According to Teece (2007a), seizing opportunities requires making investments in development and commercialisation activity; there are multiple choices in terms of investment, especially when several innovations appear on the markets. The emergence of dominant models then narrows the scope of strategic choices. Nevertheless, to stay ahead of competitors, managers must be the first to identify the most valuable models; they can do so by acquiring valuable knowledge, because knowledge is a strategic resource (Grant, 1996) that reduces environmental complexity and helps organizations perform in highly competitive environments (Khaskar et al., 2020). Knowledge acquisition represents a flow of knowledge from external stocks of knowledge into organizations (Nielsen, 2006). Acquiring valuable knowledge can be fostered by having a strong capacity for seizing (Kump et al., 2019), characterised by the formulation of responses and implementation of courses of action (Peteraf & Maritan, 2007) to transform opportunities into concrete business activities (Kump et al., 2019). This process involves problem solving, or finding ways around obstacles to achieve goals, and reasoning, which refers to evaluating information, arguments, and beliefs to draw conclusions (Helfat & Peteraf, 2015). The evaluation of information can reveal if it is valuable and can be transformed into concrete business opportunities (Kump et al., 2019; Teece, 2007a). This process may be fostered by controlled mental processing that is associated with fluid intelligence and rational thinking. Fluid intelligence is characterised by short-term memory and ‘involves the ability to reason without relying heavily on previously learned knowledge or procedure’ (Helfat & Martin, 2015, p. 840). In contrast, rational thinking describes a person’s ‘tendencies to think extensively about a problem before

responding ... [and] future consequences before taking action' (Helfat & Martin, 2015, p. 840). Controlled mental processing may regulate thinking and avoid automatic responses; by avoiding cognitive biases, it can foster knowledge acquisition, especially of knowledge that is useful to organizations (Nielsen, 2006; Zheng et al., 2011). Accordingly, we argue:

***Proposition 1c:** Managerial capacity to seize opportunities fosters knowledge acquisition through controlled mental processing.*

According to Nielsen (2006), knowledge acquisition is a process that moves from the sender to the receiver, but the receiver can lack a sufficient level of capacity to absorb, which can inhibit the acquisition process; absorption of unrelated knowledge requires more effort when absorptive capacity is lacking. This effort may be favoured by emotional commitment. As Hodgkinson and Healey (2011) argue, seizing opportunities can be enhanced by emotional commitment. Analytical processes or Internet technology (IT) mechanisms might prevent organizations from making innovative and risky investment choices, but managers' emotions can increase such choices and enable them to seize new opportunities. However, if emotional judgment dominates the rational choice process, negative feelings can cause managers to miss opportunities. Therefore, it is important for managers to regulate their emotions (Huy & Zott, 2019) rather than suppress them, so that they can continue to seize opportunities (Hodgkinson & Healey, 2011). Because emotion increases seizing capacity and seizing capacity is characterised by recognising and exploiting valuable knowledge, we argue that seizing capacity that includes emotion can foster the absorption of knowledge by facilitating the recognition of knowledge that is valuable:

***Proposition 1d:** Managerial seizing capacity, which includes emotion, fosters knowledge acquisition by improving recognition and exploitation of valuable knowledge.*

**Transforming the Resource Base.** The several modes of resource transformation include integration, reconfiguration, acquisition, and resource release (Eisenhardt & Martin, 2000). According to Teece (2007a), transformation capacity can generate the recombination and reconfiguration of assets and organizational structures as enterprises grow and markets and technologies change. Sirmon et al. (2007) indicate that resource transformation is characterised by a three-phase process: structuring a resource portfolio, bundling resources to build capabilities, and leveraging capabilities to exploit market opportunities. Whereas these authors focus on resources and capabilities, several other authors highlight the importance of knowledge to organizational transformation; Bindra et al. (2020) emphasise the importance of the effective use of knowledge to strengthen capabilities, and Teece (2007a) highlights the importance of knowledge to transformation capabilities by arguing that mechanisms linked to the creation of learning, knowledge sharing, and knowledge integration are critical to transformation capacity. Other authors argue that resource transformation also generates knowledge transfer. For example, Eisenhardt and Martin (2000, p. 1107) note that ‘transfer processes including routines for replication and brokering are used by managers to copy, transfer, and recombine resources, especially knowledge-based ones, within the firm’. Similarly, Kump et al. (2019) highlight that transformation is characterised by strategic renewal, which requires new knowledge to be integrated into entire organizations, insofar as all members of the organization are concerned with the transformation.

All these studies converge to indicate that transformation can promote new knowledge. Into this context, Helfat and Peteraf (2015) introduce social cognitive skills that underpin the transformation of the resource base. These skills can be used to perceive, assist, remember, think, and give meaning. They also help develop social skills that are essential to understanding organizational members’ viewpoints. These skills offer the opportunity to influence staff behaviour and obtain their buy-in during the transformation of resources.

However, to do so, managers must implement ‘decided renewal activities by assigning responsibilities, allocating resources, and ensuring that the workforce possesses the newly required knowledge’ (Kump et al., 2019, p. 5). Transformation capacity can foster knowledge combination, in that it integrates and applies internal and external knowledge and uses it within firms’ value-creating activities (Nielsen, 2006; Zheng et al., 2011). Because transformation capacity can generate new knowledge for organizations overall, we argue:

***Proposition 1e:*** *Managerial capacity to transform resources fosters knowledge combination through social cognitive skills.*

According to Nielsen (2006, p. 64), knowledge combination is ‘the deliberate activities in the firm aimed at locating, evaluating, selecting, and activating the knowledge resources necessary for developing and delivering a new product, service or developing an organizational capability’. That is, knowledge combination requires the involvement of all organizational members, and such involvement may be favoured by the psychological abilities of managers. Hodgkinson and Healey (2011) take a psychological stance to highlight the role of managerial skills in reducing employees’ fear and anxiety that is triggered by the launch of new strategic directions; managers must be able to build employees’ emotional commitment to new strategies. Huy and Zott (2019) indicate that regulating stakeholders’ emotions, maintaining open dialogue, and showing consideration and support of key stakeholders can create benefits such as greater stakeholder/leader buy-in of change and legitimacy, thereby allowing greater involvement of organizational members in knowledge integration. When managerial transformation capacity includes the ability to regulate stakeholders’ emotions, it may be easier to integrate knowledge within their organizations:

***Proposition 1f:*** *Managerial capacity to transform resources that includes the ability to regulate stakeholders’ emotions fosters knowledge combination by improving knowledge integration.*

## **Role of Managerial Characteristics in Knowledge Management Activities**

As previously argued, managerial and psychological abilities can foster knowledge management activities. However, these abilities are fostered by managerial characteristics such as human capital, social capital, and managerial cognition (Adner & Helfat, 2003). Thus, it is crucial to understand which characteristics may favour knowledge management activities. Regarding managerial human capital, authors argue that managerial experiences in specific contexts allow managers to acquire and develop specialised knowledge and skills (Kor & Mesko, 2013), and managerial social capital helps them obtain critical information for decision making from network ties (Adner & Helfat, 2003; Kor & Mesko, 2013). Managerial cognition is a cognitive base for decision making; according to Adner and Helfat (2003, p. 1021), it consists of ‘knowledge or assumptions about future events, knowledge of alternatives, and knowledge of consequences of the alternatives’. As upper echelon theory and dominant logic perspective suggest, managerial characteristics often are reflected at the organizational level, and managers affect organizations (Hambrick, 2007; Hambrick & Mason, 1984; Helfat & Peteraf, 2015).

According to upper echelon theory, organizational outcomes of both strategic choices and performance levels can be predicted by managerial background characteristics. Hambrick and Mason (1984) show that several managerial underpinnings—such as age, functional track, other career experiences, formal education, and socioeconomic background—influence organizational outcomes. For example, managers’ youth, amount of formal education, and other career experiences are associated with risky strategies such as innovation. Prahalad and Bettis (1986, p. 490) define a dominant logic as ‘the way in which managers conceptualise the business and make critical resource allocation decisions’. Mimicking upper echelon theory, they propose that ‘the repertoire of tools that top managers use to identify, define and make strategic decisions, and their view of the world is determined by their experiences’ (Prahalad

& Bettis, 1986, p. 490). According to Kor and Mesko (2013), the three characteristics of dynamic managerial capabilities are linked and foundational to the development of managers' dominant logic, which becomes embedded in firms' routines, procedures, and resource commitments. A dominant logic 'serves as an organizational-level information and competency filter and guides both managerial and employee actions and initiatives in configuring a firm's resources and competencies' (Kor & Mesko, 2013, p. 236). Because these three managerial characteristics can generate knowledge for managers and transfer their knowledge at the organizational level, we argue:

***Proposition 2:** Managerial characteristics foster knowledge management activities by transposing individual knowledge into organizational knowledge.*

Because the transposition of individual knowledge at the organizational level is characterised by knowledge combination (Nielsen, 2006; Zheng et al., 2011)—which is the integrating and applying of internal and external knowledge (Zheng et al., 2011)—we further argue that the three managerial characteristics foster knowledge combination.

**Managerial Cognition.** This characteristic refers to managerial beliefs and mental models that serve as a basis for decision making (Adner & Helfat, 2003; Walsh, 1995). Usually, managerial beliefs are based on historical experience (Vecchiato, 2017) and mental models that represent the stored knowledge a person has acquired over time (Maitland & Sammartino, 2015). Mental models act as both knowledge and filters for taking in new information; they identify the important elements in situations and show how they fit together. However, because of bounded rationality, managers may not consider all information (Adner & Helfat, 2003); their mental models may be based on imperfect representations (Vecchiato, 2017). Thus, they may tend to simplify complexity and uncertainty and assign information cues to a framework for understanding and action (Maitland & Sammartino, 2015). Mental models influence how managers interpret external changes and how they seek to adapt their

organizations to these changes (Vecchiato, 2017). Managers' responses may vary because each manager has a unique mental model (Maitland & Sammartino, 2015). In turn, managerial beliefs and mental models affect firm-level strategic choices, growth, and performance (Maitland & Sammartino, 2015). Managerial cognition must allow for strategy adjustments, according to changes in external environments (Adner & Helfat, 2003).

However, not all managers have the same cognitive frame. Managerial perceptions of situations depend on combinations of managers' limited fields of vision, selective perceptions, and interpretations filtered by their cognitive bases and value systems (Adner & Helfat, 2003). Some managers are better than others at interpreting situations correctly and acting accordingly. As previously discussed, managerial beliefs and mental models influence organizational variables (Adner & Helfat, 2003). For example, Hambrick and Mason (1984) indicate that managerial cognition affects how decisions are made. Both Prahalad and Bettis (1986) and Bettis and Prahalad (1995) argue that managerial cognition forms the dominant logic within an organization. Thus, we argue that managers can influence information processing at the organizational level. If their information processing manners allow them to understand their environments correctly and act accordingly, managerial cognition can generate sensing and seizing of opportunities, transforming of resource bases, and knowledge management activities. If managers transpose their skills about information processing to the organizational level, the organization can correctly process information and create organizational knowledge, given that organizations are information-processing and communication systems. Therefore, we argue that managerial cognition influences knowledge management through the creation of organizational knowledge if managers share their information-processing skills to the organizational level.

***Proposition 2a:*** *Managerial cognition can foster knowledge combination if managers share their information-processing skills to the organizational level.*

**Managerial Social Capital.** Formal and informal network ties favour managers' and leaders' abilities to access resources through relationships and connections (Kor & Mesko, 2013). They give managers/leaders some degree of influence, control, and power (Adner & Helfat, 2003). According to Adler and Kwon (2002), social capital can be of two types: internal and external. Whereas internal social capital confers influence and allows managers to obtain information from different levels of the organizations (Adner & Helfat, 2003), external social capital provides information about the practices of different firms (Gelatkanycz & Hambrick, 1997). Therefore, managers' network ties help them acquire essential resources and provide them with critical information for decision making (Kor & Mesko, 2013). Managers who have access to this information can create new knowledge and integrate it at the organizational level; this integration of knowledge favours relational capital through internal relationships between managers and employees. Managers with strong external ties also can share their networks with all organizational members. Network sharing can favour relational capital by encouraging external relationships between employees and stakeholders. Relational capital refers to the relationships between organizations and their external stakeholders, such as customers, suppliers (Huang & Huang, 2020), competitors, investors, or partners (Cabrilo & Dahms, 2018). It creates organizational value by connecting intellectual resources with external stakeholders (Wang et al., 2016). Albertini and Berger-Remy (2019) argue that stronger relationships allow for continuous improvement in new product development through knowledge sharing among suppliers, customers, and firms; they maintain that stronger relationships with customers can provide competitive advantages, because external relationships with stakeholders provide access to new information that allows them to sense and seize new opportunities. Seizing opportunities requires acquiring or developing new resources, including knowledge (Teece, 2007a). Therefore, we argue that strong managerial social capital can increase organizational relational capital (Wang et al.,

2016) and knowledge combination if managers share their social capital with their organizations:

***Proposition 2b:** Managerial social capital can foster knowledge combination if managers share their social capital with their organizations.*

**Managerial Human Capital.** This characteristic relates to the skills and knowledge managers develop during their education or through their personal and professional experiences (Kor & Mesko, 2013). Managers' prior work experiences allow them to acquire knowledge, develop expertise, and perfect their abilities (Adner & Helfat, 2003). Managerial human capital is an important factor for all the three phases of managerial dynamic capabilities (sensing, seizing, and transforming). However, heterogeneity exists among managerial skills (Helfat & Peteraf, 2015). Adner and Helfat (2003) argue that managers differ according to both their mixture of skills and level of ability for each skill. Not all managers have the same capacity to sense and seize opportunities and transform resource bases. Hambrick and Mason (1984) emphasise the importance of other career experiences for developing new perspectives; new perspectives are crucial for creating new knowledge, so managers who have spent their entire careers in single firms may have relatively limited perspectives.

The transformation of resource bases also requires change implementation (Helfat & Winter, 2011), such that managers must make their knowledge accessible throughout their organizations, including sharing it with lower-level employees. They can do so through various dimensions of structural capital, such as organizational processes, information systems, organizational culture, structure, routines, and administrative systems; such organizational support is needed to transform individual knowledge to the organizational level (Cabrilo & Dahms, 2018). Therefore, we argue that managerial human capital may influence knowledge management, as a result of organization-wide integration of knowledge that

generates new competencies, knowledge, and skills, if knowledge is made accessible to all organizational members:

**Proposition 2c:** *Managerial human capital can foster knowledge combination if managers make their knowledge accessible to their organizations.*

**Table 2.** Mechanisms that underlie knowledge management activities

Dynamic capability microfoundations (dynamic managerial capabilities)		Propositions	Mechanisms underlying knowledge management activities	Knowledge management activities
<b>Managerial and psychological abilities</b>	Sensing	P. 1a	Information-gathering, interpretation activities  - <i>Cognitive abilities</i>  - <i>Creative abilities</i>	Knowledge generation
		P. 1b	Intuition of managers  - <i>Heuristic processing</i>	
	Seizing	P. 1c	Recognising valuable information/knowledge  - <i>Fluid intelligence</i>  - <i>Rational thinking disposition</i>	Knowledge acquisition
		P. 1d	Emotion of managers  - <i>Risk taking</i>  - <i>Regulation of self emotion</i>	
	Transforming	P. 1e	Integration of knowledge, involvement of the whole organization  - <i>Social cognitive skills</i>	Knowledge combination
		P. 1f	Emotion  - <i>Regulation stakeholders' emotions</i>	
<b>Managerial characteristics</b>	Managerial cognition	P. 2a	Managerial belief and mental models  - <i>Information processing skills</i>  - <i>Transposition of these skills at organizational level</i>	Knowledge combination
	Managerial social capital	P. 2b	Formal and informal network ties of managers  - <i>Relational capital</i>	Knowledge combination

			<i>(managers and employees)</i> <i>- Sharing social capital with the whole organization</i>	
	Managerial human capital	P. 2c	Skills and knowledge of managers  <i>- Sharing skills and knowledge with the whole organization thanks to structural capital (organizational processes, information systems, organizational culture...).</i>	Knowledge combination

## DISCUSSION AND CONCLUSION

Our research emphasises the role of dynamic managerial capability in knowledge management activities (see Figure 2). Our propositions issue three contributions to knowledge-based dynamic capabilities literature. First, they describe the role of the microfoundations of dynamic capabilities in knowledge management activities, that is, the microfoundations of KBDC. Second, they emphasise the role of intuition and emotion in knowledge management activities. Third, they add to literature in knowledge management by revealing the asset-orchestration managerial capacities of sensing and seizing of opportunities and transforming of resource bases.

### Theoretical Implications

**Role of dynamic capability microfoundations in knowledge management activities.** Our first contribution is a microfoundational analysis of the relationship between dynamic capabilities and knowledge management. As indicated previously, KBDC literature is poorly developed; the few studies of the topic indicate only that dynamic capabilities generate knowledge management activities such as generation, acquisition, combination, and use (Denford, 2013; Nielsen, 2006; Zheng et al., 2011). We contribute by highlighting the underlying mechanisms that allow dynamic capabilities to generate knowledge management activities. We study and understand how the microfoundations of dynamic capabilities foster

knowledge management activities. Because authors of microfoundations literature recognise the importance of understanding individual characteristics and behaviours in explaining organizational phenomena (Felin & Foss, 2005), we focus on dynamic managerial capabilities and specifically on the three managerial abilities of sensing and seizing of opportunities and transforming of resource bases (Teece, 2007a). Our literature analysis identifies the underlying mechanisms that emanate from each managerial ability. It shows that sensing opportunities fosters knowledge management as a result of information-gathering and interpretation activities that are fostered by cognitive and creative abilities. The seizing of opportunities also enables knowledge management by identifying information/knowledge that is valuable. This ability is fostered by controlled mental processing. Finally, it shows that the transformation of resource bases fosters knowledge management through knowledge combination and the involvement of all employees, as a result of the social and cognitive skills of managers.

Microfoundations literature also indicates that collective concepts emanate from the individual level and are rooted in deliberate and intentional action (Felin & Foss, 2005). Moreover, it assumes that individual actors and their interactions are essential for understanding organizations and systems (Barney & Felin, 2013). This approach is in line with studies that indicate that knowledge is created and held by individual actors (Nonaka, 1994; Denford, 2013) and can become embedded within organizations through organizational processes and routines (Denford, 2013). Accordingly, we show that the three managerial characteristics of cognition, human capital, and social capital can foster knowledge management if managers share their individual characteristics with their organizations.

By focusing on microfoundations, we can perceive the passage from the individual level to the organizational level. We show that dynamic managerial capabilities influence knowledge management through the transformation of individual knowledge into

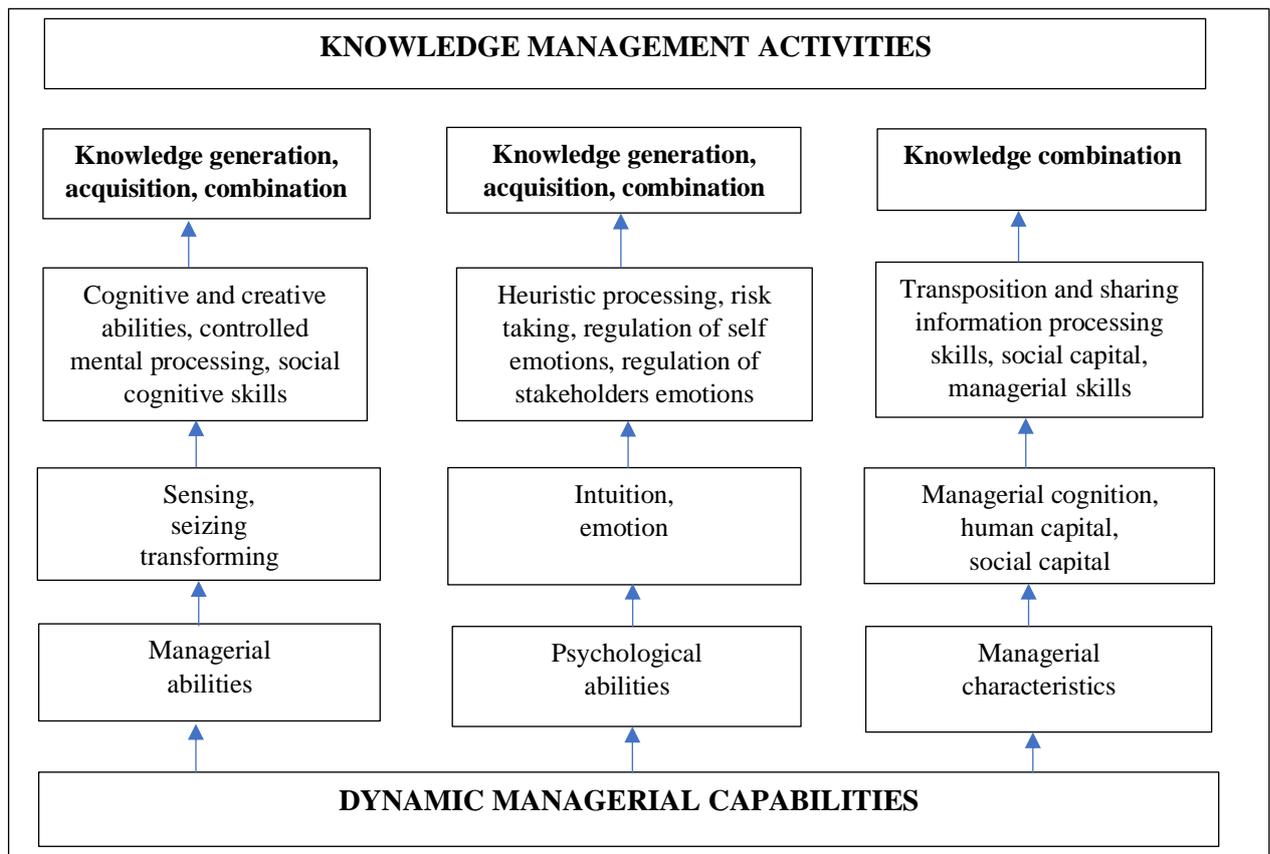
organizational knowledge. We use upper echelon theory (Hambrick & Mason, 1984; Hambrick, 2007) and the dominant logic perspective (Bettis & Prahalad, 1995; Kor & Mesko, 2013; Prahalad & Bettis, 1986) to illustrate the transposition of knowledge at the organizational level. According to upper echelon theory, organizational outcomes can be predicted by managerial backgrounds, including managers' cognitive bases, if managers have sufficient power to transpose their values and cognitive bases at the organizational level (Hambrick & Mason, 1984). In line with this theory, we argue that managerial social capital can foster knowledge management if managers share their networks with organizational members. Relationships with stakeholders can create new organizational knowledge.

We also argue that managerial cognition can foster knowledge management if managers transpose their information-processing skills to the organizational level. Therefore, we highlight the importance of interactions among individual actors (Barney & Felin, 2013). Through good information processing, organizations can generate new knowledge. Managerial human capital can influence knowledge management when managers render their knowledge accessible to their entire organizations as the result of various dimensions of structural capital, such as organizational processes, information systems, organizational culture, structure, routines, and administrative systems (Cabrilo & Dahms, 2018). Whereas prior literature indicates that organizational phenomena such as routines and capabilities can be understood according to individual-level components such as choices, agency, and cognition (Felin et al., 2012), our study contributes by emphasising the role of the microfoundations of dynamic capabilities in organizational knowledge creation.

**Role of intuition and emotion in knowledge management activities.** Our second contribution relies on the relationship between managers' psychological abilities and knowledge management activities. Whereas a microfoundations perspective highlights that understanding individual actors' behavioural and psychological foundations is crucial to

understanding organizational phenomena (Felin et al., 2012), the KBDC literature stream—as well as dynamic capabilities literature overall—insufficiently studies the psychological dimension. Moreover, microfoundations literature largely neglects the psychological perspective, focusing mainly on cognition (Felin et al., 2012; Gavetti, 2005). Our study fills this gap by explicating how intuition and emotion improve knowledge management activities. We show that intuition improves sensing capacity (Hodgkinson & Healey, 2011) to rapidly generate relevant knowledge, and emotion facilitates seizing capacity (Hodgkinson & Healey, 2011; Huy & Zott, 2019) to improve the recognition and exploitation of valuable knowledge. We also show that emotional commitment that regulates stakeholders' emotions (Huy & Zott, 2019) improves the integration of knowledge into organizations. Organizations have an interest in integrating members who have analytical reasoning modes and those who follow intuitive reasoning modes into decision-making teams, to identify opportunities and facilitate decision making (Hodgkinson & Healey, 2011). Our study corroborates this assertion by adding that intuition and emotion enable the acquisition and integration of relevant and valuable knowledge in a manner that favours rapid, efficient decision making.

**Figure 2.** Microfoundations of knowledge-based dynamic capabilities



**Integration of the sensing, seizing, and transforming framework in knowledge-based dynamic capabilities.** Our third contribution relates to integration of the sensing, seizing, and transforming framework into KBDC literature. Whereas Schiuma (2009) emphasises the role of some managerial competencies, such as knowledge asset identification, mapping, and flow, we contribute by illustrating the role of managerial abilities that are linked to sensing, seizing, and transforming. Prior KBDC literature scarcely uses these capacities, with the exception of Han and Li (2015), who highlight that sensing, seizing, and transforming capacities form KBDC. Nevertheless, these authors do not explain how these abilities foster KBDC. Our research clarifies how sensing and seizing of opportunities and transforming of resource bases (Teece, 2007a) foster knowledge management activities. Beyond the general argument that dynamic capabilities enable knowledge management activities (Nielsen, 2006; Zheng et al., 2011; Denford, 2013), we provide a more microlevel analysis and identify which managerial ability, linked to asset orchestration, fosters which

knowledge management activities. Sensing capacity enables knowledge generation through information gathering (Kump et al., 2019), because information is capable of yielding knowledge (Nonaka, 1994). We also show that seizing opportunities allows knowledge acquisition because it requires the recognition of valuable knowledge and transforming it into concrete business opportunities (Kump et al., 2019). Finally, transforming capacity that enables strategic change favours knowledge combination; this capacity requires knowledge management activities (Eisnehardt & Martin, 2000; Teece, 2007; Kump et al., 2019) such as knowledge creation (Teece, 2007) to implement strategic changes. Managers need to integrate and share knowledge with everyone in their organization associated with the transformation.

### **Managerial Implications**

Our study also contributes to managerial practice. First, we highlight the importance of knowledge in the current economy; to obtain or maintain performance, it is necessary to develop KBDC to reconfigure firms' knowledge-based resources according to the evolution of the environment. We emphasise the importance of dynamic managerial capabilities to develop knowledge management activities. We also argue that dynamic managerial capabilities comprise three dimensions: managerial abilities, psychological abilities, and managerial characteristics. In light of the importance of these three dimensions to knowledge management, we suggest it is essential for executives to learn how to develop and harness each dimension so they can mobilise all of them, as needed and required by their environments. Regarding managerial abilities, we highlight the importance of interpreting which information creates new knowledge. Firms can develop tools for information gathering, such as effective information systems. We also emphasise the role of psychological abilities in improving managerial abilities, suggesting that executives should use their intuition and emotions to sense and seize opportunities. Finally, we emphasise the role of managerial characteristics and the need for managers to share their experience, knowledge, social capital,

and information-processing skills with their organizations. From this perspective, firms can develop organizational processes such as collective discussions, debriefing sessions, and training sessions to transfer individual knowledge-based resources to the organizational level.

### **Research Avenues**

Our research offers interesting ideas for empirical studies of the propositions. Empirical studies of the link between dynamic managerial capabilities and knowledge management are lacking, and studies that seek to investigate this link are welcomed. These studies could be qualitative or quantitative; qualitative research would allow deep analyses of the propositions, such as with a case study design, whereas quantitative research could test the propositions on a larger scale to identify whether the relationship between dynamic managerial capabilities and knowledge management activities remains valid for organizations with different characteristics. In a continuation of this study, research efforts also could attempt to deepen the relationship between psychological dimensions (intuition, emotion) and knowledge management activities. In particular, researchers could analyse the relationship between dynamic managerial capability and intellectual capital. Knowledge management and intellectual capital are similar: Knowledge management comprises processes and practices that enable organizations to obtain their stocks of knowledge (Hsu & Sabherwal, 2012; Wang et al., 2016), but those stocks are characterised by intellectual capital, composed of human capital, relational capital, and structural capital (Albertini & Berger-Remy, 2019; Marr et al., 2003; Wang et al., 2016). These three components of intellectual capital are similar to the three managerial characteristics of cognition, human capital, and social capital. Continued studies should determine their influences. Finally, researchers could assess how dynamic managerial capabilities influence the knowledge-based, personality-based, and experience-based competencies that are required for knowledge management (Nikitina & Lapina, 2019).

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## **Résumé en français**

Bien que la littérature sur les capacités dynamiques fondées sur les connaissances soutienne que les capacités dynamiques favorisent les activités de management des connaissances, elle n'explique pas comment cela se produit. Pour répondre à cette question, la présente étude se concentre sur les capacités dynamiques managériales. Pour ce faire, nous mobilisons la littérature sur les microfondations qui permet une meilleure compréhension des phénomènes organisationnels. Notre étude se focalise sur trois dimensions des capacités dynamiques managériales : les capacités managériales de détection, de saisie d'opportunités et de transformation des ressources ; les capacités psychologiques d'intuition et d'émotion ; et les caractéristiques managériales liées au capital humain, au capital social et à la cognition managériale. L'étude apporte trois contributions. Premièrement, elle montre que les microfondations des capacités dynamiques génèrent des activités de management des connaissances. Deuxièmement, elle démontre le lien entre les capacités psychologiques des dirigeants (intuition, émotion) et les activités de management des connaissances. Troisièmement, elle décrit le rôle des trois composantes des capacités dynamiques (détection, saisie d'une opportunité et transformation des ressources) dans les activités de management des connaissances.