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The sources of dynamism in dynamic capabilities

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Research Summary: We develop a multi-level theory of dynamic capabilities (DCs) that explains resource dynamics by giving a central role to persons and interpersonal interactions rather than to abstract, firm-level entities. Our theory integrates the contrasting approaches to DCs in individual-, interpersonal-, and organization-level scholarship. Existing organization-level approaches portray DCs as collective endeavors but do not specify how they emerge and operate within organizations, while micro-foundational approaches illuminate actors' contributions but reduce a firm's DCs to the cognitions and actions of a few top managers. Our integrated theory instead explains DCs as effortful social accomplishments emerging from individual employees' capacity to leverage interpersonal relationships conducive to productive dialogue. The framework we propose offers new ground for understanding how DCs can be sources of sustainable competitive advantage.

Managerial Summary: How can firms navigate the transformations that relentlessly raise new threats and opportunities in dynamic environments? We suggest that firms develop dynamic capabilities to navigate change when their employees are connected through high-quality relationships, empowering their innovative potential. Strategic adaptation is possible when people are given the opportunity to act, think, and feel creatively while performing tasks, thus envisioning opportunities to improve how the firm operates. This ability supports sustainable, firm-level innovation when employees are connected through interpersonal relationships founded on constructive dialogue. Dialogue allows participants to advance and accept proposals for change even in the presence of conflicting interests and viewpoints. Managers may therefore enhance their firm's capacity for change by fostering individual integration and developing contexts that facilitate dialogue and constructive opposition.

KEYWORDS

dynamic capabilities, interpersonal relationships, multilevel theory, mesolevel, Personalism

1 | INTRODUCTION

A central question in strategic management is why some firms are systematically capable of keeping their resources and activities aligned with changing environmental dynamics while others are not (Helfat & Winter, 2011). One explanation attracting increasing attention focuses on dynamic capabilities (DCs). This explanation emphasizes a firm's capacity to sense new opportunities in its environment and then seize those opportunities by adapting, integrating, and reconfiguring its key assets and activities (Helfat et al., 2007; Teece, 2007; Teece, Pisano, & Shuen, 1997). DCs underpin key firm functions such as strategic planning, acquisitions, alliances, outlet proliferation, R&D, and product development (Eisenhardt & Martin, 2000; Helfat & Winter, 2011). In essence, they allow firms to capture change opportunities by rearranging firm resources. Where exactly this capacity is located, however, and how it operates, has been a source of ongoing debate.

On the one hand, a macro, organizational-level view conceptualizes DCs as higher-level organizational routines (Schilke, 2014; Teece, 2007; Zollo & Winter, 2002) or decision-making rules and algorithms (Eisenhardt & Martin, 2000). While helpful to a point, treating DCs primarily as routines makes it difficult to identify the sources of dynamism in firms. Decision heuristics and repeated patterns of action make resource dynamization reliable and systematic, but they restrict participants' autonomy to act creatively and thereby effect innovative change. Ultimately this view limits the extent to which DCs can bring about change, because routines are path-dependent and premised on local learning (Levitt & March, 1988) and, thus, unlikely to generate exploration in distant domains (Winter, 2008).

On the other hand, a micro, individual-level approach interprets DCs as decision-making activities premised on the skills of one or a few entrepreneurial top executives (Adner & Helfat, 2003; Helfat & Peteraf, 2015; Teece, 2007). While targeted managerial actions can be critical for enabling change when firms confront unexpected environmental shocks, the micro-level emphasis on key individuals factors out patterns of collective action that can function independently of the actors who enact them (Felin, Foss, & Ployhart, 2015; Nelson & Winter, 1982). Thus, an emphasis on top managers as a source of DCs obscures how firms create systematic and reliable processes for resource dynamization (Zollo & Winter, 2002) and undermines the creativity of lower-level employees (Adler & Obstfeld, 2007).

These contrasting interpretations make DCs paradoxical entities (Peteraf, Di Stefano, & Verona, 2013) that simultaneously involve stability and change (Feldman & Pentland, 2003). This paradox has profound practical implications because firms need both the reliability of routines and the creativity of individuals to systematically reconfigure resources to adapt to change (Helfat et al., 2007). Polaroid, for instance, lacked the individual element when it responded inadequately to the emergence of digital imaging in the 1980s. The firm's capabilities and management structural principles, which were centered on instant photography, prevented constructive opposition to the outdated business model until an electronic imaging team, comprised entirely of new hires, was established after

1990 (Tripsas & Gavetti, 2000). Between 1986 and 1996, Apple lacked the collective element when it failed to assimilate Steve Jobs' creative action into replicable innovation practices, and the company returned to success only after his comeback in 1997 (Heracleous, 2013). Thus, as demonstrated in both individual cases (e.g., Danneels, 2010) and large-N studies (e.g., Rothaermel & Hess, 2007), the antecedents of how firms develop new capabilities to cope with shifting markets cannot be found at a single—individual or collective—level of analysis. As a result, DC theory in its present state cannot adequately explain how the contributions of individual employees become aggregated into a firm-level capacity for systematic asset renewal. Nor can it explain how a dynamic, firm-level routine, once it has emerged, can be perpetuated without also curbing the innovativeness of individual employees, on which the capacity to adapt is premised.

We address these questions by developing a new, multi-level theory of DCs. To connect the micro/individual level with the macro/organizational level of existing single-level DC frameworks, we propose the meso-level element of interpersonal connections among a firm's employees. We ground our propositions on Personalism, a philosophical school that posits the self as a self-in-relation (Buber, 1970; Scheler, 1973; Wojtyla, 1979). We further build on social psychological theories and symbolic interactionism (Bengtsson, 2006; Blumer, 2004; Dewey, 1922), and on organizational frameworks that leverage social relationships to explain managerial phenomena, such as the relational view (Dyer & Singh, 1998; Gittell, 2002; Grant & Parker, 2009), social and intellectual capital (Blyler & Coff, 2003; Nahapiet & Ghoshal, 1998), consensus and diversity in collective learning (Argyris, 1993; Fiol, 1994; Grant, 1996), and behavioral integration in upper echelons theory (Hambrick, 2007). Finally, to complement and integrate the existing DC frameworks, we connect these underpinnings to the managerial phenomenon of resource dynamization.

Focusing on interpersonal connections allows us to explicate how individual-level action aggregates into firm-level DCs: by means of a dense web of interrelated actions supported by productive dialogue, a form of interpersonal behavior and verbal interaction (Berkovich, 2014; Tsoukas, 2009). Specifically, when dialogue is productive, it allows employees to share contrasting and even conflicting views on the need to change firm resources, to respect each other's viewpoints, to develop proposals for change, and arrive at an actionable consensus (Lindenberg & Foss, 2011; Teece, 2007; Winter, 2008). When employees' resource dynamization efforts are grounded on interpersonal connections and productive dialogue, DCs are simultaneously reliable and creative, patterned and dynamic.

A multi-level approach to DC research offers several important advances. At the individual level, we suggest that the micro-foundations of the individual actions on which DCs are premised are not a product of cognition, habit, or emotion in isolation, as existing contributions suggest; instead, they are an integration of the three. If an employee's actions simultaneously integrate cognition, habit, and emotion, his or her habitual behavior may be interrupted by emotions erupting from a mismatch between learned action (habit) and changes in the environment. Interruptions to habitual behavior motivate individuals to engage in deliberate efforts (cognition) to devise better ways to combine firm resources. We see individual-level integration as the micro-level source of DCs. At the meso level, we propose that relationships between employees, created through productive dialogue, are the missing aggregation principle in explaining how individual actions congeal into firm-level DCs (Felin & Hesterly, 2007); their addition allows us to build a coherent theory of DCs and thereby explain their paradoxical nature. In particular, we see productive dialogue as the means through which individual employees' proposals for change become aggregated into a firm-level dynamic capacity. Finally, at the firm level, our theory offers a novel perspective for understanding if and how DCs determine sustainable competitive advantage. We explain DCs as emerging in a firm from the unique and difficult-to-imitate configuration of the different degrees of integration of its employees and the quality of their myriad interpersonal connections. Ongoing dialogue among employees explains how the pattern of

actions that they perform (the higher-level dynamic routine) is kept flexible and constantly morphing to adapt to the ever-shifting forms of environmental dynamism. The resulting view sees DCs not as assets or steady states, but as complex social accomplishments.

2 | THE DC PARADOX: HOW DO ROUTINES ATTAIN RESOURCE DYNAMISM?

Organizational capabilities—a firm's capacity to reliably perform particular tasks or activities (Helfat & Peteraf, 2003, p. 999; Helfat et al., 2007, p. 1)—are a major source of organizational advantage (Barney, 1991). Capabilities are bound to superior performance because they solve complex problems using close-knit routines that organizations learn gradually (Dosi, Nelson, & Winter, 2000; Nelson & Winter, 1982). Hence, capabilities are a historical concept, because they emerge from successful responses to past challenges and are thus bound to specific types of context-problem constellations (Schreyögg & Kliesch-Eberl, 2007). Due to their path-dependent character, capabilities are subject to erosion in volatile markets. Over time, solutions that were successful under previous regimes may hamper adaptation to different competitive landscapes (Danneels, 2010; Leonard-Barton, 1992). For this reason, scholars shifted their attention from the idiosyncratic features of capabilities to a firm's ability to change and quickly develop new capabilities as the key prerequisite for building and sustaining organizational advantage (Helfat & Peteraf, 2003).

The challenge in this debate has been to identify a source of reliable and systematic adaptation. The idea here is that if a firm's assets and capabilities must systematically change, the sustainability of competitive advantage should reside at a higher level, within the mechanisms directing the evolution of resources. The promise of DCs rests exactly on their nature as reliable mechanisms for resources adaptation. In this view, an organization or a top manager have a DC when they are capable of systematically renewing the firm's endowment of resources by creating new resources, shedding old ones, and renewing the mix of both internal and external resources (Helfat et al., 2007; Helfat & Peteraf, 2015). In contrast, an organization whose adaptation is disjointed, involving sporadic acts of creativity or ad-hoc problem solving to master problems only as they arise, is not exercising a DC (Schreyögg & Kliesch-Eberl, 2007; Winter, 2003; Zollo & Winter, 2002).

The patterned and reliable nature of DCs has a downside that is at the heart of a number of unsolved problems (Felin et al., 2015). DCs are innovation routines and cognitive processes that organizations and executives build by interpreting the outcomes of past actions within past problem-sets (Eisenhardt & Martin, 2000; Zollo & Winter, 2002). For instance, based on its early experiences in post-acquisition integration, an organization may develop a routine to manage future mergers in a systematic and relatively predictable way (Zollo & Singh, 2004). How can these historically-bound approaches to problem solving, which are optimized for a context and resource set that is now out of date, address future environmental threats and opportunities? The major theoretical and practical concern is whether or not innovation routines and individual cognitive frames learned from past experiences actually allow the frame-breaking changes that creative agents suggest or environmental discontinuities require (Felin & Foss, 2005; Schreyögg & Kliesch-Eberl, 2007).

Our purpose is not to endorse this criticism of DCs—a perspective that indeed has already generated important insights (Foss, Heimericks, Winter, & Zollo, 2012). Rather, we want to note that the assumptions on which the DC framework is currently premised reflect only a portion of a more complex process, and may thus underestimate the adaptive potential of DCs. We contend that by addressing the theoretical problems in these assumptions, an updated DC framework would be capable of coherently incorporating different degrees of change and resource dynamization in environments

characterized by different and shifting levels of dynamism (Drnevich & Kriauciunas, 2011; Helfat & Winter, 2011; Schilke, 2014). The extension we propose would allow the concept of DCs to live up to the potential envisioned in their early characterization by Nelson and Winter—as a set of “routines which operate to modify over time various aspects of [firms’] operating characteristics” (Nelson & Winter, 1982, p. 17). We hence suggest that a comprehensive conceptualization of DCs, in which they are capable of determining change at different levels of intensity and in different contexts, requires a better specification of the sources of their dynamism. Table 1 reports the assumptions behind current notions of DCs and the theoretical problems those assumptions generate.

A first concern in the DC framework (Table 1, line A) is the limited role ascribed to individuals, due to the prevailing interpretation of DCs as emerging from organization-level routines. This assumption has raised several calls to explore the individual-level foundations of DCs (Felin et al., 2015) and inspired detailed proposals of how such foundations may be described in terms of individual action and cognition (Helfat & Peteraf, 2015). A second concern (Table 1, line B) relates to perceived limitations on the innovation DCs can facilitate in areas that are distant from a firm’s past experience. If DCs are conceptualized as routines or individual knowledge that incorporate learning accumulated from repetitive change processes, they will bind attention and action to a predefined framework shaped by those past processes, leaving no space for trying something new

TABLE 1 Key assumptions and related problems in current notions of dynamic capabilities (DCs)

Relevant dimensions	Key DC assumptions	Theoretical problems
(A) <i>Level of theory</i> : At what level do DCs exist and operate?	<i>Collective</i> : DCs are based on firm-level organizational routines and patterned processes Eisenhardt & Martin (2000) and Zollo & Winter (2002)	Limited role of <i>individuals</i> ; missing micro-foundations Felin et al. (2015) and Teece (2012)
(B) <i>Source of change-related knowledge</i> : Where does knowledge incorporated in DCs come from?	<i>Experience</i> : DCs are learnt from repetition of past change processes, facilitated by knowledge articulation and codification Nelson & Winter (1982) and Zollo & Winter (2002)	Limited role of <i>experimentation</i> and <i>spontaneous acting</i> disconnected from past experience Salvato (2009) and Schreyögg & Kliesch-Eberl (2007)
(C) <i>Type of change explained</i> : What type of change are DCs capable of determining?	<i>Incremental</i> : DCs explain change within constant or predictable environmental features Eisenhardt & Martin (2000) and Helfat & Winter (2011)	Limited role of DCs in determining reliable and systematic <i>change in highly dynamic contexts</i> Drnevich & Kriauciunas (2011) and Schilke, (2014)
(D) <i>Aggregation principle</i> : How do intelligent adaptive efforts of individuals aggregate to form organizational-level DCs?	<i>Serendipity</i> : individual attempts at improving processes are exploited at the organizational level, but the underlying mechanism is not explained Salvato (2009) and Winter (2013)	Absence of <i>meso-level elements</i> connecting individual-level creativity to firm-level capacity to innovate and to dynamically address emerging issues Ployhart & Moliterno (2011) and Salvato & Rerup (2017)
(E) <i>Locus of change-related knowledge</i> : Where does knowledge incorporated in DCs reside?	<i>Habits</i> : DCs reside in habitualized action patterns, supported by procedures and artifacts Nelson & Winter (1982)	Limited role of <i>intentionality</i> , cognition and emotions in determining change Adler & Obstfeld (2007) and Hodgkinson & Healey (2011)
(F) <i>Mechanism for change in the current resource base</i> : How is the knowledge incorporated in DCs applied to change situations?	<i>Repetition</i> : DCs are practices activated by the recurrence of similar situations or problem structures Nelson & Winter (1982)	Limited role of <i>reflection on action</i> allowing to sense opportunities for change triggered by novel situations or problem structures Teece, (2012)

(Schreyögg & Kliesch-Eberl, 2007). This problem is related to the further concern (Table 1, line C) of assuming that DCs originated in constant or predictable environments will be incapable of facilitating reliable change in contexts that are highly dynamic (Eisenhardt & Martin, 2000). A further problem is explaining how individual-level change skills and efforts aggregate to form an organizational-level change routine (Table 1, line D). Absent a link at the meso level, any theory of DCs will be incapable of explaining how innovative actions of employees create a firm-level capacity for dynamism that is effective and reliable over time (i.e., the micro-to-macro link). Similarly, lacking a meso-level mechanism, DC theory will be unable to explain how a firm's repetitive, patterned routines for innovation can persist over time without curbing the creativity of individual participants, on whom the actual operation of DCs ultimately rests (macro-to-micro link). Finally, DC frameworks without a meso-level mechanism cannot account for employees' intentionality and emotions in change processes (Table 1, lines E and F). Instead, they see individual participants in firm-level DCs as acting on habit or cold cognition alone (Hodgkinson & Healey, 2011).

3 | A MULTI-LEVEL APPROACH TO RESOURCE DYNAMIZATION

This article takes a different approach. We contend that organizational routines, capabilities, and their dynamics involve multiple levels of analysis, and that greater theoretical clarity about the relationship among these levels is needed (Salvato & Rerup, 2011; Winter, 2013). To achieve that clarity, we first take advantage of different theoretical frameworks in management that explain how people and firms effect systematic change; we then arrange those frameworks across multiple levels of analysis. None of them alone offers a coherent vision of how individual-level behaviors lead to a collective, higher-level entity such as a DC. We therefore complement the management theories with Personalism—a view of human action in social contexts that, in our view, supplies the missing links for a comprehensive model of DCs (Bowne, 1908; Buber, 1970; Mounier, 1952; Scheler, 1973; Wojtyla, 1979). Our resulting multi-level approach (Figure 1) moves the locus of resource dynamization away from an exclusive focus on either the collective or the individual level.

By introducing a meso-level link between dynamic routines and the individual participants in those routines, our model explains: (a) how DCs originate in the integration, or simultaneous operation, of habitual behaviors, emotions, and cognition of individual employees (i.e., at the micro level), allowing individuals to systematically recognize the need for change in current routines and capabilities (lower part of Figure 1); (b) how individual-level abilities are amplified when employees involved in change events interact through relationships conducive to productive dialogue, thereby manifesting a higher-level, collective social phenomenon (i.e., at the meso level) (middle part of Figure 1); and (c) how the multiple, firm-specific combinations of individual-level integration and interpersonal-level connections produce heterogeneous DCs (top part of Figure 1) capable of triggering asset realignment at different levels of intensity (incremental vs. radical) and environmental dynamism (stable vs. high-velocity), and which in turn create the potential for sustainable competitive advantage (at the macro level). Figure 2 illustrates our comprehensive model and summarizes our key constructs and propositions across the three levels of analysis.

Figure 2 illustrates how managers may enact environmental dynamism differently, and how these differences can lead to firm-level responses with varying levels of dynamism, depending on factors at the micro and meso levels. At the micro (individual) level, the extent to which an individual employee's behavior results from the simultaneous operation (integration) of action, cognition, and emotions will determine his or her propensity to recognize the need/opportunity for change, and resolve to act. At the meso (interpersonal) level, the quality of relationships and dialogue will

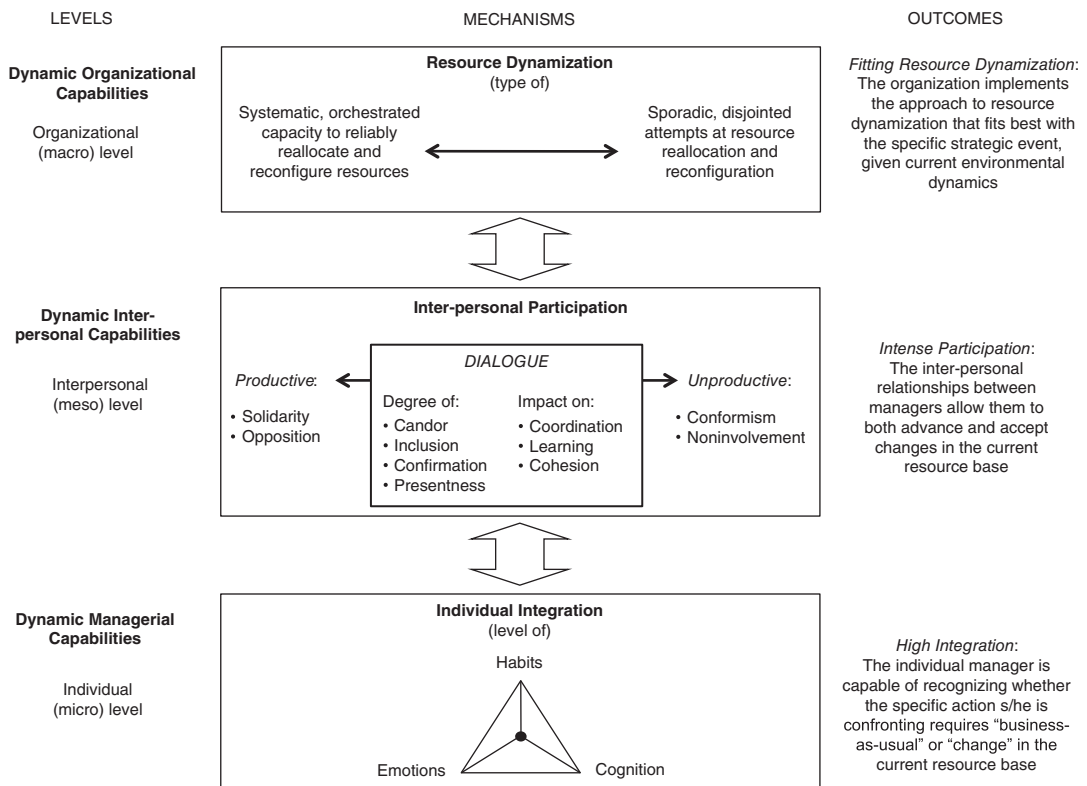


FIGURE 1 A multi-level framework of dynamic capabilities

determine the likelihood that the employee or employees who envisioned a change proposal will actually advance it, and that their co-workers will engage constructively and develop it jointly. These interactions can congeal into a variety of firm-level responses to environmental dynamism. The representation in Figure 2 is not a causal model, and therefore it does not fully capture the richness of resource dynamization; nevertheless, it features the individual and social phenomena we consider most salient in the emergence and operation of organizational DCs.

3.1 | Individual (micro) level: The integration of habits, cognition, and emotion in resource dynamization

The first questions to address when building a multi-level theory of DCs (Winter, 2013) are these: How should we think about individual actors when our objective is to explain how DCs attain resource dynamism through path-dependent processes? How do employees within firms characterized by DCs act, think, and feel? DCs are described as firm-level entities (Teece et al., 1997). However, the capacity to initiate the process of sensing and seizing opportunities to change a firm's resource base in response to environmental dynamism ultimately rests on individuals (Eggers & Kaplan, 2013; Felin et al., 2015; Helfat & Peteraf, 2015). It is therefore essential to provide an account of organizational behavior that incorporates both employees' tendency to respond to change by enacting lessons learned in the past and codified in their habits (Zollo & Winter, 2002), and their ability to deliberately sense and respond to the need for change "in the moment" (Teece, 2012).

To address these questions, scholars developed the domain of dynamic managerial capabilities and their cognitive underpinnings (Adner & Helfat, 2003; Eggers & Kaplan, 2013; Helfat & Martin,

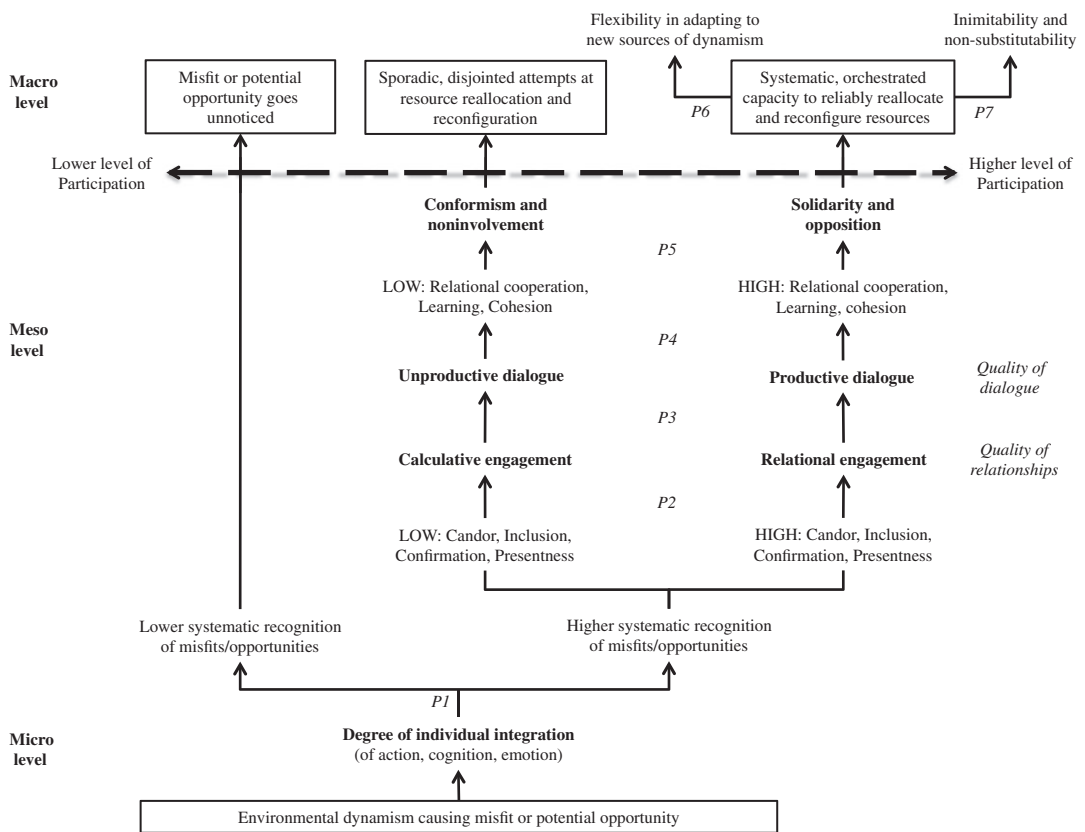


FIGURE 2 Multi-level patterns of managerial response to environmental dynamism

2015). We suggest two extensions of this work. First, we complement focus on cognition by integrating the two other determinants of human action: learned behavior and emotion. Second, we expand the role of the individual in DCs from “the ability of entrepreneurial top executives to persuade others in their organization to undertake new initiatives” (Helfat & Peteraf, 2015, p. 843) to the diffused ability of all employees to participate in resource renewal by proposing, accepting, or jointly developing change initiatives, viewing DCs as effortful social accomplishments (Feldman & Pentland, 2003).

Human action is premised on three determinants: habit (or learned behavior), emotion (or affect), and cognition (or deliberation) (Cohen, 2007; Dewey, 1922; Hodgkinson & Healey, 2011). Each determinant is somewhat autonomous and may lead to action on its own. For instance, logical deliberation triggers ad-hoc problem solving (Winter, 2003), inferential learning (Miner & Mezias, 1996), and search (Levitt & March, 1988); habit provokes routinized individual answers to external stimuli (Bargh & Chartrand, 1999; Nelson & Winter, 1982); and emotions spur automatic physical and cognitive reactions (Hodgkinson & Healey, 2011). None of the three, alone, will lead an employee to sense and seize opportunities to question the current resource base. We thus suggest (bottom of Figure 2) that if individuals in firms do not integrate habits, cognition, and emotions in their actions, many strategic threats or potential opportunities will go unnoticed.

Integration is a quality of the relationship between a person and his or her actions (Wojtyla, 1979); nevertheless, integration—the simultaneous operation of habits, emotion, and cognition—is a

rare occurrence in human action. Instead, faced with novel threats or opportunities, individuals tend to respond by relying on habitual behavior and mind-frames. Danneels (2010, p. 25), for instance, reports a dialogue with the CEO of Smith Corona, the typewriter manufacturer eventually displaced by personal computers: "I remember arguing with him that computers are the future. He said: No, no, no, you don't understand; our market is this, and this is where we are successful, and this is where we are recognized."

While habit predisposes individuals to certain actions, it does not in itself determine all action (Cohen, 2007). An employee who is open to the influence of emotions on his or her behavior will be more likely to perceive opportunities outside of habitual behavior, and will therefore be more likely to propose innovation and change. Such emotions can be triggered by perceptions that some of the habitual resources and actions through which the firm makes its living currently (Helfat & Winter, 2011; Winter, 2003) are inadequate to threats or opportunities emerging in dynamic environments. Employees may perceive these challenges through emotional responses, such as frustration with the firm's current resource base, in the case of emerging threats (Tripsas & Gavetti, 2000), or excitement, in the case of recognized opportunities (Adler & Obstfeld, 2007). When an individual employee is open to the influence of these emotions, a cognitive process arises aimed at deliberately searching for alternative lines of action. Then, when the employee devises an alternative for action, deliberation ends and he or she can advance a proposal for improving current action. For instance, in the case of Smith Corona, product development managers concerned about the threat of personal computer technology advocated for change (Danneels, 2010). Similarly, managers at the design firm Alessi sensed an opportunity for large-scale production in the early 1990s, in a company that had previously focused on the small-scale production of expensive objects (Salvato, 2009). This process of integration, leading to action, suggests:

Proposition 1 (P1) *When an employee's level of integration is higher, he or she will be more likely to systematically recognize and act upon the need for change in dynamic environments.*

3.2 | Interpersonal (meso) level: Dialogue and interpersonal participation

3.2.1 | The missing link in explaining DCs

We turn now to the central question of how integrating habits, cognition, and emotion at the level of individual employees results in a dynamic capability at the firm level. We propose that DCs emerge (Kozlowski, Chao, Grand, Braun, & Kuljanin, 2013) at the firm level when, at the interpersonal level, employees collectively engage in relationships composed of relational engagement and productive dialogue (Tsoukas, 2009; Wojtyla, 1979), as Figure 2 illustrates. Productive dialogue instigates constructive conflict around the potential responses to change held by organizational actors, leading to a firm-level combination of employees' diverse interpretations, decisions, and actions (Danneels, 2008; Tjosvold, Wong, & Chen, 2014). Neither individual-level integration nor the superior insight of individual executives (Felin & Foss, 2005; Helfat & Peteraf, 2015) will alone be sufficient to establish a DC, because capabilities are a product of social interaction and represent a way of solving problems that is shared collectively (Schreyögg & Kliesch-Eberl, 2007). This is true for two reasons. First, while an individual manager or employee may independently devise change proposals to adapt to or instigate change, such proposals rarely incorporate all the requisite information and interpretation, and they may conflict with proposals formulated by others (Tjosvold et al., 2014). Lacking a social mechanism to combine the behavior of individual employees, with their

varied levels of integration, a firm may, at most, engage in sporadic and disjointed attempts at resource dynamization (Helfat & Winter, 2011; Winter, 2003). Second, efforts at establishing routines for systematic asset realignment—such as setting up product-development or post-merger-integration teams and codified procedures—may reduce the level of integration of individual employees involved in these practices by placing excessive emphasis on hierarchy, procedures, and “playing by the rules.” Thus, two relevant questions arise at the meso level: How is the ability of individual employees to alternate habitual and innovative behavior—their level of integration—aggregated and systematically enacted into firm-level dynamic routines? What mechanism prevents the patterned and semi-automatic nature of firm-level DCs from reducing employees’ integration and creativity?

3.2.2 | Four modalities of interpersonal interaction generate employee relationships conducive to DCs

A number of theories posit that interpersonal relationships play a central role in dynamic, firm-level phenomena grounded on individual-level factors. The relational view in strategy explains alliance rents as resulting from routines for knowledge sharing between the managers of collaborating firms (Dyer & Singh, 1998), while the relational perspective in OB explains how increasing interaction among coworkers and with service recipients allows firms to adapt to shifting environmental requirements (Grant & Parker, 2009). Theories of social capital explain how social interaction creates the human and intellectual capital that firms need to generate rents (Nahapiet & Ghoshal, 1998; Yli-Renko, Autio, & Sapienza, 2001) and to appropriate them (Blyler & Coff, 2003). Theories of collective learning emphasize the social dimension of the creation and transfer of new knowledge in organizations (Argyris, 1993; Fiol, 1994; Grant, 1996). At the executive level, the upper echelon theory proposes that the joint tenure of top management team members, and the time they spend working together, explains how they develop behavioral integration (Hambrick, 2007). At lower hierarchical levels, research on the dynamics of organizational routines (“routine dynamics”) identifies how interpersonal connections allow participants to accomplish contrasting goals while participating in the same routine (Salvato & Rerup, 2017). These works have in common the central role of interpersonal connections in dynamic, firm-level phenomena. However, they are grounded in different and often contrasting assumptions, and each falls short of offering a multi-level view of DCs.

Personalism offers a coherent system of ideas with which to connect the insights across firm levels, in particular through the concept of participation (Wojtyla, 1979). According to Personalism, the meso-level link between the micro, individual-level and the macro, firm-level of DCs is the participation of individual employees in a community of productive social relations. Personalism acknowledges that a person can establish two distinct types of relationships with other people: as “subjects” and as “objects” (Buber, 1970). These two positions lead to very different outcomes. In the former (“I–You” relationships), deep interpersonal relationships emerge and become the context for reconfiguring the resource base; individuals feel free and safe to propose and accept improvements, making it easier for them to find shared solutions to environmental changes. In contrast, when the other person is approached as a means to an end (“I–It” relationships), interpersonal relationships are inhibited and the creative process of resource dynamization is obstructed.

Tsoukas (2009) defined “I–You” connections as relational engagement, which prompts employees to feel responsible for improving the social setting of their joint action. The resulting connections have a high emotional carrying capacity, can be extended to multiple purposes, and have a high degree of generativity, which are all essential features of DCs. As a result, individuals make themselves “more open to one another” (Tsoukas, 2009, p. 945). The opposite attitude is calculative engagement, where individuals confine themselves to minimally cooperative behaviors, or

behaviors that aim to maximize individual gains rather than firm welfare (Tsoukas, 2009). The main individual purpose of calculative engagement is to control others, not to engage them in a productive interpersonal relationship.

Relational engagement—cooperative behavior aimed at promoting change in the context of conflicting viewpoints and motivations—is a result of four modalities of interaction (Figure 2): candor, inclusion, confirmation, and presentness (Berkovich, 2014). Candor is direct and sincere communication, as opposed to attempts to manage impressions or maintain a façade. Inclusion is produced when actors make an effort to experience collaborators' thoughts and feelings, not in a detached manner but as a living reality. It is the outcome of a genuine effort to understand the meaning of another person's ideas, actions, and emotions. Confirmation is the "acceptance of otherness," the attempt to value one another as people, acknowledging each participant's viewpoint as meaningful even when others do not agree with it. It is a form of open-mindedness and respect toward collaborators. Finally, presentness is the mutual commitment to a relationship enacted by listening attentively and responding to communications and actions. By engaging in presentness, participants jointly experience the present and create the future together (Berkovich, 2014). When jointly enacted, these four modalities of interaction represent a way of working together premised on a genuine interest in the other, what Schein (2013) defines as humble inquiry.

The crucial role of candor and commitment in interpersonal relations, and of the acceptance of "otherness" instead of an "us-versus-them" approach, is apparent in accounts of DCs with varying degrees of effectiveness. For example, two opposing approaches to interaction characterized IBM's decision-making DC before and after its turnaround:

[IBM's DC is] a process where general managers are willing to blow the whistle and ask for help when they need it. Under the old system, the annual strategy review process created an us-versus-them mindset where senior managers attempted to poke holes in the line-of-business plans. Candor on the part of line managers was not rewarded. Furthermore, in the strategic reviews, criticism about others' deficiencies exacerbated the tendency for leaders to be conservative in their strategies. Under the new system, the essence of strategy is "disciplined, fact-based conversation" (Harreld, O'Reilly, & Tushman, 2007, p. 29).

In relational engagement, employees de-emphasize self-interest and instead maintain an attitude of being helpful to one another in a psychologically safe environment (Edmondson, 1999). Accounts like this one suggest it is conducive of dynamic outcomes:

At IDEO ... informal conversations often occur between designers known to face specific technical challenges (expected to ask for help) and designers known to have pertinent expertise (expected to give help). A designer said: I think that people here feel really free about just throwing things out in casual conversations in the halls. [You ask] "Oh, Lee, I got a problem, maybe you have an answer for me." ... You stop and throw your ideas out ... [This] requires problem-solving arenas in which communication of complex problems and solutions are possible. IDEO's brainstorming, other scheduled meetings, e-mails, and informal conversations create such rich communications and allow the retrieval of specific technological solutions that often take far different forms than those in which they entered the organization's memory. (Hargadon & Sutton, 1997, pp. 739–40).

To capture these dynamics, we advance the following proposition:

Proposition 2 (P2) *Employee interactions characterized by more candor, inclusion, confirmation, and presentness will result in higher levels of relational engagement than interactions that lack these qualities.*

3.2.3 | Linking individual integration to firm-level DCs through dialogue

How does relational engagement transform individual managers and employees with conflicting motivations and viewpoints into a community that strives jointly to accomplish systematic resource adaptation? According to Personalism, the social mechanism that connects employees is dialogue (Wojtyla, 1979) in the form of joint action, communication, meetings, telephone calls, get-togethers, and chance encounters (Gratton & Ghoshal, 2002; Tsoukas, 2009). While this interpersonal, meso-level behavior has received little attention in theories of DCs so far, recent attempts at capturing the hybrid nature of DCs have suggested that DCs reside in organizations' social relationships (Argote & Ren, 2012; Teece, 2012). Dialogue is a form of joint action in social relationships, in which individuals endeavor to align their understanding of a situation to accomplish a common goal, regardless of whether they agree with every detail (Garrod & Pickering, 2009; Tsoukas, 2009). Dialogue is also a quality of joint action. Genuine dialogic moments—moments that produce shared meanings, allowing participants to act together cooperatively—are possible when actors take active responsibility not only for the joint task at hand, but also for the relationship they have with one another as they interact (Gittell, 2002; Schein, 2013). Relational engagement fosters productive dialogue because “open-minded discussion occurs when people work together to understand each other's ideas and positions, impartially consider each other's reasoning, and seek to integrate their ideas into mutually acceptable solutions” (Tjosvold et al., 2014, p. 549).

Within companies, different individuals tend to have a different sense of urgency about the need to address or create change, as well as different individual motivations to get involved in change initiatives (Kotter, 2008). Employees tend to list priorities according to their own preferences or the preferences of their leaders (Gottschalg & Zollo, 2007). These contrasting viewpoints and motivations generate conflict that may hamper decision-making processes for change initiatives (Tjosvold et al., 2014). The central role of interpersonal interactions in our multi-level model suggests dialogue is the “glue” that links together individuals and teams, teams and the organization. Specifically, dialogue allows employees to develop the shared consensus and commitment required to achieve ambitious, long-term goals within highly dynamic environments and contested decision-making processes.

To summarize, productive dialogue is an essential ingredient for firms to develop DCs. Genuine, productive dialogue premised on relational engagement—the “I-You” relationship—offers participants a sense of integration and wholeness with themselves, with other participants, and with the organizational context (Berkovich, 2014; Schein, 2013), thus binding the micro, meso, and macro levels of DCs. It allows individuals to act collectively, even in conflict situations, without sacrificing their individual-level integration of cognition, habits, and emotions. Therefore:

Proposition 3 (P3) *Relative to employee interactions characterized by calculative engagement, interactions characterized by relational engagement will be more conducive to productive dialogue in contexts with conflicting viewpoints about, and motivations toward, resource change.*

3.2.4 | Dialogue determines the emergence of firm-level DCs by enhancing all three dimensions of individual-level integration

Productive dialogue determines the emergence of DCs by acting upon cooperation among employees involved in change initiatives, their learning patterns, and their level of cohesion, as suggested in Figure 2. Each of these mechanisms enhances one of the three dimensions of individual-level integration—behavior, cognition, and emotion, respectively—as they are enacted collectively (vs. individually) in joint change initiatives, and will be particularly relevant in settings with high uncertainty and conflict, as is common in highly dynamic environments.

First, with respect to *behavior*, productive dialogue strengthens the patterns of *cooperation* among employees and makes them more receptive to both advancing and accepting change proposals (Okhuysen & Bechky, 2009). Specifically, productive dialogue allows employees to ascertain the type and extent of cooperation required by strategic events characterized by different levels of dynamism. In stable contexts, relational engagement and dialogue allow employees to identify the minor, incremental improvements that are needed to adjust their actions—even the most routinized ones—to the specific contexts in which they are performed (Feldman & Pentland, 2003). Even in these “business as usual” situations employees need to communicate synchronously, to interact intensively, and to adapt to one another’s actions (Salvato & Rerup, 2017). Besides adapting habitual behavior to the circumstances, nurturing dialogue in stable contexts creates the conditions to perform radical change, when needed. As environmental dynamism increases, so does the lack of fit between necessary activities and the skills and capabilities of employees and organizational units. This mismatch prompts actors to behave oversensitively and to “defend turf” rather than engage in open discussions about capabilities in need of adaptation (Danneels, 2010). From the perspective of Personalism, an increase in dynamism may prompt employees to revert to “I-It” relationships, in which coworkers are seen as threats or even enemies. In these dynamic situations, productive dialogue is particularly relevant, because it allows employees to shift away from competition and toward the cooperation required to make conflict constructive.

Second, dialogue affects *cognition* by influencing individual and collective *learning* patterns. Research on the micro-foundations of innovation revealed that a focus on “individual productivity alone presents an undersocialized view of human capital,” and that focus should also be directed toward “embedded relationships by individuals to effectively perform knowledge-generating activities” (Grigoriou & Rothaermel, 2014, p. 586). Within embedded relationships, productive dialogue elevates individual learning by allowing employees to engage in more frequent, coordinated, and reciprocal interactions that ease knowledge creation and transfer. Explicit and tacit knowledge are smoothly disseminated, enhancing the firm’s ability to acquire, absorb, and transfer knowledge, which is an essential component of a firm’s absorptive capacity and DCs (Argote & Ren, 2012). Productive dialogue allows employees—and particularly change agents such as senior managers and star scientists in pharmaceutical companies (Kaplan, Murray, & Henderson, 2003; Rothaermel & Hess, 2007)—to transfer their often tacit cognitive frame of the need for change and their conceptualization of possible action plans to their co-workers. Through dialogue, change agents help cue the firm to potential shifts in the environment and direct it toward promising change initiatives by transferring their tacit understanding, or by engaging collaborators in the joint development of shared mental maps and solutions to change needs.

Third, dialogue affects *emotion* by adjusting the level of *cohesion* among employees. Cohesion is the extent to which unit members are attracted and committed to one another—similar to what Lindenberg and Foss (2011) define as joint production motivation. It is a critical component of social capital, particularly in dynamic environments, in which employees must synchronize their activities and recycle work back and forth amongst themselves to quickly achieve the proactive

problem-solving a firm needs to adapt to or instigate change (Yli-Renko et al., 2001). Moreover, a positive affect is essential in the highly uncertain context that surrounds employees' attempts at asset realignment (Hodgkinson & Healey, 2011). Within such trial-and-error processes, failure is common. If employees do not feel that they belong to a cohesive community that shares common goals, the fear of failure can inhibit them from advancing change proposals. Positive affect among employees enhances psychological safety and, as a result, the likelihood of attempts at resource reconfiguration (Edmondson, 1999). Therefore:

Proposition 4 (P4) *Greater levels of productive dialogue will improve the rates of relational cooperation, mutual learning, and cohesion among employees engaged in change initiatives.*

3.2.5 | Dialogue and the emergence of DCs: Solidarity and constructive opposition versus conformism and non-involvement

The effects of productive dialogue on cooperation, learning, and cohesion transform the myriad change proposals advanced by individual employees into a firm-level capacity for continuous renewal, because they establish the two attitudes of *solidarity* and *opposition* among collaborators, as Personalism argues.

A first outcome of the greater cooperation, learning, and cohesion engendered by productive dialogue is employees' enactment of *solidarity* in joint work—behavior showing that the firm and its employees are structurally interdependent, united, and cohesive (Willer, Flynn, & Zak, 2012). Relational cooperation, mutual learning, and cohesion allow employees to be constantly ready to accept and realize their own share, both because they value being members of the group and because they have the “benefit of the whole,” or “common good” in mind (Wojtyla, 1979). In particular, solidarity includes those situations in which it is necessary to take over more than one's usual share of work and be ready to complement what is done by others. Solidarity has also been referred to in management studies as reciprocal interdependence (Martin, 2011), or substitution (Okhuysen & Bechky, 2009): situations in which individuals understand the tasks linked to each role and can substitute for one another in task execution when needed. It also resembles the concept of organizational citizenship behavior (OCB; Van Dyne, Graham, & Dienesch, 1994), defined by Organ (1988) as individual behavior that is discretionary, that is not recognized in formal reward systems, and that promotes the effective functioning of the organization. Martin (2011), for instance, described the DC developed by employees managing a diversified portfolio of assets as emerging from solidarity behaviors:

Tom's BU and mine have similar customer bases. A lot of people buying Tom's products are buying my products. So we have a lot of synergy in terms of target customers and so our products are used in the same environments ... if we were facing a common competitor, say if Microsoft decided to be a competitor on all fronts, Fred's group would block and tackle ... Tom's group would lead with edgy product responses, and I would lead with new technology responses (Martin, 2011, p. 127).

The second outcome of enhanced cooperation, learning, and cohesion is a constructive *opposition* to the current state of affairs, which implies questioning the fit of the firm's existing asset base—how it currently makes its living—with the ongoing dynamics of the external environment (Van Dyne et al., 1994). Opposition is the behavior of the employee who voices concerns about a firm's rules or routines in a constructive way (Wojtyla, 1979). It is constructive when actors *question the status quo* as a way to improve it. It is a form of constructive conflict (Tjosvold et al.,

2014) that emerges as an antecedent of DCs both in large-n studies (Danneels, 2008) and in illustrations of DCs, such as for product development.

As micro-level social systems, [product development capabilities] create conflict with the micro system and hence a managerial paradox ... project managers who constructively “discredit” ... the systems, skills or values traditionally revered by companies may cause a complete redefinition of core capabilities or initiate new ones. They can consciously manage projects for continuous organizational renewal (Leonard-Barton, 1992, p. 123).

The attitude of opposition is mirrored in existing concepts such as constructive deviance, abrasion, beneficial deviant behavior, principled organizational dissent, tempered radicalism, whistleblowing, functional disobedience, and exercising voice (Mainemelis, 2010; Morrison, 2011; Skilton & Dooley, 2010; Warren, 2003). It has parallels in descriptions of the social mechanisms underlying more- or less-effective DCs (e.g., Martin, 2011).

The importance of solidarity and constructive opposition in understanding DCs becomes particularly salient when considering their opposites: *conformism* and *non-involvement* (Figure 2). When firms are unable to trigger productive dialogue—when “I-It” relationships dominate—individuals cannot engage in solidarity and opposition, and thus they fall back on either conformism or non-involvement. An employee may recognize the need to update organizational resources and he or she may even devise an adequate solution. Yet, lacking an organizational environment conducive to cooperation, joint learning, and cohesion, the steps to advancing change will be perceived as so costly and difficult that the employee will withhold his or her proposal. Moreover, lacking quality connections, agents of change such as star scientists and visionaries in pharmaceutical firms may not be individually capable of determining the positive effects of innovation, because these result from the full mediation of their community of co-workers (Rotharmel and Hess, 2007). Thus:

Proposition 5 (P5) *Higher levels of relational cooperation, mutual learning, and cohesion from productive dialogue will result in behaviors high in solidarity and constructive opposition, while lower levels of cooperation, learning, and cohesion will result in conformism and non-involvement.*

3.2.6 | Participation as a dynamic interpersonal capability

The ultimate meso-level outcome of dialogue within our multi-level theory of DCs is *participation* (Figures 1 and 2), which we define as the interpersonal ability of managers and employees to act together to reach a firm-level goal (e.g., dynamic asset realignment) by amplifying their individual-level integration of habit, cognition, and emotion through productive dialogue. Without participation, individual employees’ contributions may result only in sporadic and disjointed individual attempts at resource dynamization, because DCs only emerge from the type of high-quality connections that invite participation. Moreover, where there is no participation, establishing firm-level routines, rules, and procedures that force the creation of DCs onto individual employees can disrupt individual-level integration, trapping participants in habitual behaviors that will prevent them from proposing, accepting, or jointly devising suggestions for resource adaptation. While individual integration is a quality of the relationship between an employee and his or her own actions, participation is a quality of the relationship between employees, and may hence be described as a *dynamic interpersonal capability* (Figure 1).

3.3 | Organizational (macro) level: Firm-level dynamic capabilities

In multi-level models, the final stage results in a higher-level collective phenomenon that, in our case, is the firm-level DC (Kozlowski et al., 2013; Ployhart & Moliterno, 2011). Accordingly, in this section we describe DCs as emerging from individual-level integration and being amplified by interpersonal-level dialogue. The key questions at this stage are: How do individual employees' levels of integration and the quality of their relationships determine a firm's capacity to reconfigure resources to address different rates of environmental dynamism? How does this capacity create and sustain competitive advantage?

3.3.1 | Addressing different rates and types of environmental dynamism

Different types and rates of environmental dynamism require different configurations of DCs (Eisenhardt & Martin, 2000). Participation is a source of flexibility that allows firms to adapt to different forms of dynamism. It allows employees with diverse backgrounds to integrate their knowledge and create new knowledge to face diverse and shifting environmental contingencies (Grant, 1996; Tsoukas, 2009). The practice of productive dialogue trains employees with different backgrounds in everyday skills for collaboration, such as running a meeting, listening, leading a team, and making group decisions. Productive dialogue improves employees' skills to appreciate contrasting worlds of thought from colleagues in different departments. Finally, dialogue amplifies employees' ability to anticipate what colleagues in other departments need to know or do, allowing them to more quickly diagnose and resolve problems. Over time, interaction and mutual adaptation among employees creates stores of knowledge about innovation, allowing the firm to flexibly respond to different environmental dynamics (Eisenhardt & Martin, 2000; Helfat et al., 2007; Teece, 2007). Thus:

Proposition 6 (P6) *Resource dynamization emerging from productive dialogue gives firms greater flexibility to adapt to new sources of dynamism or to instigate change autonomously.*

3.3.2 | Creating and sustaining competitive advantage

An organization consistent with our multi-level model of DCs will be inherently dynamic, because participating in productive dialogue spurs employees to continuously create and recreate the new knowledge necessary to face threats and seize opportunities. However, given the complexity associated with social processes of interaction among employees, firm-level patterns of asset realignment based on participation will be unique to each firm, rendering them potential sources of sustainable competitive advantage (Ployhart & Moliterno, 2011; Teece et al., 1997). What is remarkable about this multi-level approach to DCs is that the source of sustainable advantage is less located in the collective structure of the underlying routines (e.g., the structure and agenda of a cross-functional product development team) than in *how* employees interact in those routines. Each of the structural elements of a firm's dynamic capability is potentially replicable by competitors. More difficult to copy is the integrated way in which these activities are implemented through employee interaction.

This insight supports and expands the micro-foundations perspective of DCs (Felin et al., 2015; Helfat & Peteraf, 2015). In our multi-level model (Figure 1), micro-foundations are not limited to the efforts of individual employees, but include the social mechanisms embedded in interpersonal processes. To illustrate, consider a firm that establishes an above-average DC for product development. Competitors might try to replicate that advantage by hiring away one or several key employees involved in the first firm's product development, or by seeking out new employees with

equivalent abilities. Competitors might also be able to replicate superficial features of the first firm's product development processes (e.g., by setting up a cross-functional brainstorming routine staffed with highly creative and competent employees). These efforts notwithstanding, it is highly unlikely that any competitor would be able to successfully replicate or imitate the leader firm's DC for product development, because no competitor will be able to duplicate the critical patterns of interpersonal dialogue and interaction *among employees* that created the DC in the first place (Ployhart & Moliterno, 2011). To summarize, while the output of a multi-level DC—the “what” of that DC (e.g., the capacity to perform product development in a reliable manner)—may be similar across firms (Eisenhardt & Martin, 2000), the combination of disparate levels of managers' individual integration and of their patterns of social interaction—the “how” (e.g., the staffing and operating of new-product brainstorming sessions)—is definitively firm-specific. Thus:

Proposition 7 (P7) *Processes of resource dynamization emerging from intensive productive dialogue will be more difficult to imitate or substitute.*

3.4 | Boundary conditions and possible moderators

Productive dialogue and participation affect resource dynamization in all types of organizations. However, in this paper we have intentionally focused our attention on relationships within a single organization, bracketing off the contribution of external relationships and absorptive capacity to the development of a firm's capabilities (Argote & Ren, 2012). Yet the underlying mechanisms through which participation unfolds within and across firms may partially differ depending, for instance, on firm size, age, and ownership structure. First, firm size, measured as the number of employees, may affect patterns of dialogue and participation. In small and very small firms, strong interpersonal connections may lead to “overembeddedness” (Uzzi, 1997), because the smaller number of very close relationships may deter organizational actors and business units from seeking external sources of knowledge, thus reducing a firm's innovative capability. In line with this prediction, Yli-Renko et al. (2001) found a negative association between relationship quality and capability development in their sample of small firms. Second, in young firms, which need to quickly and intensively expand their knowledge base, some dimensions of social capital may affect processes of knowledge exchange and combination. In these firms, high levels of trust increase the expectation that information will be promptly provided by internal collaborators, thus reducing the incentive to autonomously acquire knowledge externally (Nahapiet & Ghoshal, 1998). Finally, in firms that are closely held by a family, the high level of trust created by strong connections among family members may reduce constructive opposition. This closeness can lower the cost and time required for knowledge exchange and innovation, but it can also reduce the level of productive conflict and intense processing of information required in dynamic environments (Miller, Minichilli, & Corbetta, 2013). We thus anticipate that the effect of productive dialogue on the emergence of DCs will take on different forms depending on a firm's size, age, and family control.

4 | DISCUSSION

We develop a multi-level theory to explain how the paradoxical nature of DCs—they are simultaneously patterned and dynamic—allows them to become sources of sustainable competitive advantage. We apply the insights on human interaction offered by Personalism, along with complementary theories built around interpersonal connections, to propose that DCs do not arise

exclusively from organizational-level routines or individual-level cognition. Instead, we propose that routines and cognition are two ends of a multi-level construct linked at its center by interpersonal skills. As such, in order to be sources of competitive advantage, DCs need to be synchronized across three distinct levels—from the individual to the interpersonal, and from the interpersonal to the organizational. The degree of synchronization, in turn, will determine the degree of resource dynamization. At the micro level, employees whose habits, cognition, and emotion are highly integrated will be more capable of recognizing and advocating for improvements in the use of current assets, but their actions are not in themselves enough to cause systematic asset realignment. Instead, individual-level integration aggregates into a reliable firm-level capability for change when employees enact interpersonal relationships using productive dialogue, which favors participation. Different configurations of integration and participation determine the firm-level capacity to produce asset realignment at different levels of intensity (incremental to radical) and environmental dynamism (stable to high-velocity), which in turn creates different levels of sustainable competitive advantage. This suggests that DCs should not be treated as monolithic firm assets but as fluid social accomplishments whose effectiveness varies across time and among firms.

4.1 | Conceptual implications

Our approach to DCs breaks away considerably from prior conceptualizations by emphasizing their emergent nature. Existing literature portrays DCs as firm-level entities premised on organizational routines (Helfat et al., 2007; Helfat & Winter, 2011). However, given that routinized, history-dependent processes are not always capable of reconfiguring resources to adapt to future changes (Abell, Felin, & Foss, 2008; Schreyögg & Kliesch-Eberl, 2007; Teece, 2012), the macro-level approach cannot account for the source of creativity and innovation inherent to DCs. Micro-foundational approaches have addressed these concerns by reducing DCs to the level of the individual actor (Felin et al., 2015; Helfat & Peteraf, 2015). These approaches highlight the role of individual employees, but they fail to explain how firms develop a diffused ability to change that is above and beyond the unique skills of individual top managers (Winter, 2013).

To address these controversies, we invite researchers to consider these multiple levels simultaneously. Complex social phenomena such as DCs are better explained in terms of individuals *plus* the relations between those individuals, which aggregate at the firm level (Winter, 2013). In particular, the micro-foundation of DCs in our model is not only individuals' capacity to integrate habit, cognition, and emotion, but their capacity for productive interpersonal dialogue. As a mechanism, productive dialogue both aggregates individual contributions into firm-level resource dynamism and reinforces individual-level integration. The result is a relentless virtuous circle.

For DCs to produce sustainable competitive advantages, all three levels—micro, meso, and macro—must be fully developed and function simultaneously. The meso level of interpersonal relationships is a particularly important component because it houses the mechanism through which the abilities of individual employees to address change are transformed into a dynamic capability for asset reorganization at the firm level. Our theory applies to any type of organizational change. However, the interpersonal dynamics we describe make it particularly likely that some employees within an organization will become *champions of resource change*, mirroring yet extending the roles of product champions and core-competence stewards described by authors in the resource-based view of competitive advantage (e.g., Hamel & Prahalad, 1994).

The conceptual approach we advocate reconciles the paradox of DCs as history-dependent, high-level routines that are simultaneously dynamic and adaptive. Authors who have commented on this paradox have proposed that asset realignment may be a result of either deliberate interventions

by individual employees (2010Eisenhart, Furr, & Bingham, 2010; Felin et al., 2015; Teece, 2012) or of separate organizational functions devoted to “alert environmental surveillance,” in which all firm efforts at asset reconfiguration are contained (Schreyögg & Kliesch-Eberl, 2007). These approaches conceptually separate firm practices (i.e., how the firm currently makes its living) from *reflecting on* firm practices (i.e., advancing proposals to alter the current asset base). However, they fail to combine the strength of patterned problem solving with dynamization, which is the essence of the DCs concept and the source of its power to explain firm performance across time.

By merging the patterning and dynamization of DCs into a single integrated concept, our multi-level model of DCs has important implications for the growth and sustainability of competitive advantage. Although the output of a DC can be similar across firms, the processes through which such output is obtained will be different. Eisenhardt and Martin (2000) observed that the collective features of DCs are more homogeneous than is usually assumed. Yet, we claim that the underlying patterns of interaction among employees, and their individual levels of integration, could make a difference for how DCs work across firms.

4.2 | Research implications

Although we see merit in performing more research on DCs at a single (individual or firm) level of analysis (2016), here we offer guidelines for how DCs as a multi-level construct can be measured and for how hypotheses derived from our suggested propositions might be tested. Suppose, for example, that a researcher is interested in assessing the strength of DCs in a sample of firms within an industry (or different business units within firms), in investigating how DCs emerged (or failed to), or in testing their effects on resource dynamization and performance. How can this researcher create a research design that matches the multi-level conceptualization of DCs, and what advantages would such a design have relative to the existing operationalizations? To address these questions, the multi-level nature of DCs should be aligned with four key choices of research design: (a) construct and measurement choices; (b) model choices; (c) sampling choices; and (d) analysis choices (Hitt, Beamish, Jackson, & Mathieu, 2007; Kozlowski et al., 2013; Kozlowski & Klein, 2000).

4.2.1 | Construct and measurement choices

In our view, a DC is not a “global property” of the firm that can be readily and objectively observed, as in the case of monetary investments in R&D or the headcount of a firm’s M&A office. The DCs in our model do not originate in one-time investment decisions or in the characteristics of individual employees. DCs are not even a “shared property” of the firm, because the underlying individual factor (personal integration) is not shared homogeneously by all employees (some employees and managers have higher levels of integration, while others are predominantly guided by habitual action, cognition, or emotions in isolation). Rather, DCs are a “configural property” of the firm—that is, they emerge from individual features through interpersonal dialogue—and as such researchers cannot make any assumption that the individual (level of integration) and dyadic (quality of dialogue) characteristics are held in common by any two actors. The researcher in our example should therefore try to measure the array or configuration of these individual characteristics, rather than some synthetic measure such as their sum or average.

The configural nature of DCs has at least three profound implications for how our researcher could operationalize them. First, a measure of DCs should capture the combination of behavior, cognition, and emotions that employees experience when addressing change events. Although our researcher should develop a tailored measure, he or she may start from existing indexes of individual-level, holistic efforts, such as Rich, Lepine, and Crawford’s (2010) measure of job

engagement. A second implication is that our conceptualization of DCs should be empirically captured through survey-based, perceptual measures at the level of the individual employee, since surveying knowledgeable senior managers is likely to produce an inaccurate, firm-level perception of these individual-level constructs. Survey-based measures are subject to more perceptual biases, and are less readily available than archival data, but they have far greater construct validity (2016). The third implication is the need to develop collective-level measures of DCs (at the firm or unit level) by adopting data-combination techniques to represent the patterns and variability of integration within the firm, rather than some shared or average level (Kozlowski & Klein, 2000).

4.2.2 | Model choices

Most current conceptualizations describe DCs as a collective construct (e.g., firm-level R&D investment) that determine the behavior of individuals (e.g., their innovativeness) in a “top-down” fashion, or which directly determine firm-level effects (e.g., financial performance). The DCs in our model instead emerge and take shape through the actions of members of the collective—they operate from the ground up (Kozlowski et al., 2013). It will therefore be most appropriate to use “bottom-up” models, or models of “emergence,” in which dynamic interaction processes among lower-level entities (e.g., individuals, dyads, teams) over time yield phenomena that manifest at higher, collective levels (e.g., business unit, function, firm) (Kozlowski & Klein, 2000).

Models of emergence are complex because they incorporate both dynamic interactions among lower-level entities and the structural properties that emerge at the collective level (Kozlowski et al., 2013). These approaches have proved valuable in explaining the impact that individual members have on different group characteristics (Rousseau, 1985). The researcher in our example could therefore consider treating integration and participation through dialogue as separate independent variables that may explain the DC dependent variable. Alternatively, participation may be considered as mediating the effect of individual integration on DCs.

4.2.3 | Sampling choices

To operationalize DCs, the researcher should seek a sample in which the pattern of data varies significantly across the firm and its units (Rousseau, 1985). For instance, it would be inappropriate to test a model that links interpersonal participation to DCs through a sample of employees belonging to a single function (e.g., R&D). If function-specific characteristics, such as level of routine codification, constrain between-function variability, this choice would yield a restriction of range on the measure of interpersonal participation, precluding a fair test of the model (Kozlowski and Klein, 2000). Testing multi-level models of DCs thus requires sampling strategies that allow for between-unit variability at all relevant levels: individual, dyadic, team, and firm.

Temporal considerations are also relevant, because firm-level DCs, meso-level participation, and individual-level integration operate on different time scales. In general, individual-level phenomena change more quickly than firm-level ones, making it easier to detect change in individual-level integration or interpersonal participation. In contrast, firm-level processes and routines take more time to change. Capturing the emergence of DCs will therefore require long-term longitudinal or time-series designs.

4.2.4 | Analysis choices

Bottom-up emergent phenomena such as DCs have three focal characteristics that should be mirrored in the analytical procedures used to test them (Kozlowski et al., 2013). First, emergent phenomena are *multi-level*, because they encompass at least two different levels of analysis; a lower

level at which the phenomenon originates (in our case, the integration of individual cognition, affect, and behavior) and a higher level at which the collective property manifests (the DC of a business unit or firm). Second, emergent phenomena are *process oriented*, because their central component is the process mechanism (in our case, interpersonal dialogue) that drives dynamic interaction among entities (individuals), yielding the emerged property (DC). The process mechanisms are thus the theoretical engine of emergence and they need to be specified and tested with precision. Third, *temporality* is central, because it takes time for emergent phenomena to manifest at the higher level through the operation of the process mechanism.

The researcher may thus choose between two types of analytical methods: interpretive qualitative methods and data-analytic quantitative methods. Qualitative methods are the most common for analyzing emergent phenomena, although they have not yet been applied to the study of DCs as a multi-level, emergent construct (Danneels, 2010). They are best suited to address the characteristics of a multi-level model of DCs by providing rich and thick descriptions of the micro-level phenomena that generate DCs, of the processes through which they emerge, and of the contextual features that drive or moderate these processes.

Quantitative methods have been deployed almost exclusively to test top-down multi-level models where attention is directed at understanding how a higher-level collective phenomenon determines (or moderates) lower-level phenomena (Kozlowski & Klein, 2000). In these cases, designs adopting hierarchical linear model (HLM) have been widely used. This specification is inappropriate for bottom-up emergent processes because HLM assumes hierarchically nested data structures. Moreover, they typically involve an outcome variable at the lowest level of analysis, with multiple predictors at the same or higher levels.

4.3 | Implications for managers

Our multi-level approach suggests that rather than spreading resources over various practices aimed at enhancing DCs at the individual or organizational levels alone, it may be worthwhile to focus resources on practices aimed at both increasing employees' level of personal integration and at enhancing interpersonal participation. For instance, to accomplish greater integration, staffing practices could be tailored to select employees who possess high job engagement, which results from holistically investing oneself in a work role. Organizations could then use mentoring, socialization, and a set of people management practices to preserve job engagement at the physical, emotional, and cognitive levels. Empirical research has shown integrating these three individual dimensions is aided by practices aimed at fostering the congruence of individual and organizational values; increasing the level of support from the organization; and enhancing core self evaluations, defined as employees' self appraisals of their own worthiness (Rich et al., 2010). Through leadership training and performance management systems that provide developmental feedback, top managers could then foster employees' perceptions that the organization supports their individual efforts to be fully engaged and present in their jobs.

Several tools have also been suggested to create an organizational context that is conducive of dialogue (for an overview see Mille Bojer, Roehl, Knuth, & Magner, 2008). The managerial literature offers descriptions of different forms of programmed conflict or constructive controversy. The two used most commonly are dialectical inquiry and devil's advocacy (e.g., Schweiger, Sandberg, & Ragan, 1986), which use formalized dialogue to introduce constructive conflict to decision making process, while maintaining an open-minded discussion (Tjosvold et al., 2014). The *Change Lab* is a multi-stakeholder dialogic change process designed to generate collective insight, shared commitment, and creative capacities needed to address complex organizational problems such as post-

merger integration or develop new product technologies (Mille Bojer et al., 2008). General Electric's Workout is another example of a structured and focused change process (Bartlett & Wozny, 2005). Collaborative practices like these are conducive to DCs because they enhance dialogue in the firm by institutionalizing questioning and doubt, creating time and space for conversations, legitimizing the raising of big, broad questions, and developing new rules and forums for quality managerial interaction (Gratton & Ghoshal, 2002). It is these unique patterns of dialogue among employees that produce firm-level processes that are flexible, quick and reactive—that is, that are dynamic.

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