



Leadership for organizational adaptability: A theoretical synthesis and integrative framework

Mary Uhl-Bien^{a,*}, Michael Arena^b

^a Neeley School of Business at Texas Christian University, United States

^b General Motors, United States

ARTICLE INFO

Keywords:

Ambidexterity
Dynamic capabilities
Innovation
Networks
Complexity leadership

ABSTRACT

One of the biggest challenges facing leaders today is the need to position and enable organizations and people for adaptability in the face of increasingly dynamic and demanding environments. Despite this we know surprisingly little about this topic. In this paper we provide a theoretical synthesis and integrative review of research from strategy, organization theory, innovation, networks, and complexity to provide a framework of leadership for organizational adaptability. Our review shows that leadership for organizational adaptability is different from traditional leadership or leading change. It involves enabling the adaptive process by creating space for ideas advanced by entrepreneurial leaders to engage in tension with the operational system and generate innovations that scale into the system to meet the adaptive needs of the organization and its environment. Leadership for organizational adaptability calls for scholars and practitioners to recognize *organizational adaptability* as an important organizational outcome, and *enabling leadership* (i.e., enabling the adaptive process through adaptive space) as a critical form of leadership for adaptive organizations.

“As leaders, if you don't transform...if you don't reinvent yourself, change your organization structure; if you don't talk about speed of innovation—you're going to get disrupted. And it'll be a brutal disruption, where the majority of companies will not exist in a meaningful way 10 to 15 years from now.”

John Chambers, Executive Chairman of Cisco, March 2016

One of the biggest challenges facing leaders today is the need to position and enable organizations and people for adaptability in the face of increasingly dynamic and demanding environments. As described by John Chambers of Cisco, “You've got to disrupt or be disrupted...[it's about moving] the sources of innovation...from being something you do on the fringe to something you have to do mainline... [and refocusing] on leaders who could work horizontally together as opposed to in silos” (Chambers, 2016). Accomplishing this requires understanding how to lead organizations for adaptability. Yet in the leadership field, we know surprisingly little about this topic. Leadership for organizational adaptability involves enabling organizations and people to cope effectively with change and uncertainty. Its focus is on how leaders can unleash the potential of systems and people to adjust and adapt in ways that successfully address the needs of a shifting environment (Burke, Pierce, and Salas, 2006; Hooijberg, Hunt, and Dodge, 1997; Parry, 1999; Rosing, Frese, and Bausch, 2011; Uhl-Bien and Marion, 2009).

Leadership for organizational adaptability differs from leading change in that, rather than focusing on how leaders can drive change top down, e.g., through vision and inspiration (Baur et al., 2016; Griffith, Connelly, Thiel, and Johnson, 2015; Margolis and Ziegert, 2016; Zaccaro and Banks, 2004), it addresses how leaders can position organizations and the people within them to be adaptive in the face of complex challenges. It taps into current requirements for organizations and those within them to be flexible, agile and adaptive in response to changes associated with a volatile and often unpredictable world (Doz and Kosonen, 2010; Keister, 2014; Reeves and Deimler, 2011; Uhl-Bien, Marion, and McKelvey, 2007; Worley and Lawler, 2010). As described in the opening quote, it is a multi-faceted concept that uses a systems-level approach to designing adaptive organizational structures, enabling networked interactions, nurturing innovation, and providing leadership development that fosters collaboration (e.g., social capital) along with individual performance (e.g., human and intellectual capital) (Chambers, 2016; see also Day, Fleenor, Atwater, Sturm, and McKee, 2014; Davis and Eisenhardt, 2011; Hollenbeck and Jamieson, 2015; Janssen and van der Voort, 2016; Winby and Worley, 2014; Uhl-Bien and Arena, 2017).

Leadership for adaptability is being touched upon in emerging research on leadership. We see it in discussions of leadership and ambidexterity (Havermans, Den Hartog, Keegan, and Uhl-Bien, 2015; Rosing

* Corresponding author.

E-mail address: m.uhl-bien@tcu.edu (M. Uhl-Bien).

et al., 2011; Turner, Swart, and Maylor, 2013; Zacher, Robinson, and Rosing, 2016; Zacher and Rosing, 2015), dynamic capabilities (Chen and Chang, 2013; Eisenhardt and Martin, 2000; Martin, 2011; Teece, 2016), leadership and networks (Balkundi and Kilduff, 2006; Li, 2013; Marion, Christiansen, Klar, Schreiber, and Akif Erdener, 2016; Mehra, Smith, Dixon, and Robertson, 2006; White, Currie, and Lockett, 2014, 2016), complexity (Lichtenstein and Plowman, 2009; Plowman et al., 2007; Schneider and Somers, 2006; Uhl-Bien et al., 2007), innovation (Carmeli, Gelbard, and Gefen, 2010; Howell and Boies, 2004; Makri and Scandura, 2010; Marcy, 2015; Osborn and Marion, 2009), paradox and tension (Fairhurst et al., 2016; Kan and Parry, 2004; Schad, Lewis, Raisch, and Smith, 2016; Smith, 2014), and collective leadership (Foldy, Goldman, and Ospina, 2008; Ospina and Foldy, 2010). While these advancements are addressing issues related to leadership for adaptability, they are occurring in disparate literatures across a range of fields. What is needed is a careful examination and integration of this work that informs us about the ways in which leaders enable people and organizations for adaptability.

The purpose of this article is to provide a theoretical synthesis and integrative review of research across fields that, when combined, can provide understanding of leadership for organizational adaptability. We begin by reviewing the literatures with an eye toward leadership implications for enabling adaptive organizations. We then synthesize these literatures into an integrative framework of leadership for organizational adaptability. Using this integrative framework, we offer research and practice implications regarding leadership for organizational adaptability. We conclude by discussing the importance of advancing research on leadership for adaptability and its critical relevance for practice.

Organizational adaptability

The need for organizational adaptability is a core premise of organization studies. Since the earliest writings of Barnard (1938), Simon (1947), Selznick (1957) and Thompson (1967), we have known that for organizations to survive they must adapt in accordance with their environment (Schumpeter, 1949). Because of its importance, the topic has been addressed in a variety of literatures across a range of fields. The sheer vastness of the literature (O'Reilly and Tushman, 2008) has generated snapshots of findings, each through the lens of a particular disciplinary perspective. Moreover, because the work is being conducted in fields other than leadership, the leadership implications are not always clear. To build an integrative framework of leadership for adaptability, consolidation of these findings through a leadership lens is needed.

In the sections below we review major theories from across these literatures to identify implications of these approaches for leadership of organizational adaptability. Because the implications are not always obvious, we focus on managerial and employee activities that can imply how leaders enable adaptability. We begin with ambidexterity and dynamic capabilities from strategy, organization theory (OT) and entrepreneurship, since these provide the classic approaches. We then briefly review theories of innovation, networks and complexity.

Ambidexterity

The basic premise of organizational ambidexterity theory is that to maintain long-term adaptability and viability, organizations must balance the tension between *the need to innovate* and *the need to produce* (Duncan, 1976; Tushman and O'Reilly, 1996). March (1991) depicts these competing demands as two aspects of organizational learning: (1) exploration, i.e., creating new knowledge, skills and processes to sustain future viability through search, variety, risk taking, experimentation, play, flexibility, innovation, discovery, etc.; and (2) exploitation, i.e., using existing knowledge, skills and processes to produce results for current success through selection, refinement, choice, efficiency,

implementation, execution, etc. The theory proposes that organizations that effectively manage these competing demands are ambidextrous—they both exploit current capabilities (i.e., exploitation) and explore fundamentally new competencies (i.e., exploration) (Levinthal and March, 1993). Stated differently: “While renewing to adapt for tomorrow requires change, flexibility and creativity, profits for today require order, control and stability” (Cegarra-Navarro and Dewhurst, 2007, p. 1721).

According to Birkinshaw and Gibson (2004), organizational adaptability is “the ability to move quickly toward new opportunities, to adjust to volatile markets and to avoid complacency” (p. 47). Leading to achieve this is not easy, however, as it requires simultaneously leveraging *organic* (decentralized) structures for exploration and *mechanistic* (centralized) structures for exploitation (Burns and Stalker, 1961; Duncan, 1976; Thompson, 1967). When out of balance, organizations fall into traps: a “competence trap” (Leonard-Barton, 1992) from exploiting obsolete competencies and a “failure trap” (Levinthal and March, 1993) from frenzies of exploration that drive out exploitation. Because balance can be “highly difficult or simply impossible” (Boumgarden, Nickerson, and Zenger, 2012, p. 588), some adopt vacillation approaches (Nickerson and Zenger, 2002), which argue that exploration and exploitation are achieved by dynamically alternating, both temporally and sequentially, between the dual structures (Boumgarden et al., 2012; Gulati and Puranam, 2009; Siggelkow and Levinthal, 2003). In a vacillation approach, the role of leaders is not balance or simultaneity (Boumgarden et al., 2012) but striving for high levels of *both* exploration and exploitation.

Although ambidexterity could arise in formal structure or vision statements of a charismatic leader, Birkinshaw and Gibson (2004) argue that it is more likely achieved through the creation of supportive contexts in which individuals choose how and where to focus their energies. Leadership of ambidexterity is a characteristic displayed by everyone in the organization, and not just the top: “The impetus toward ambidexterity may sometimes be driven by top-down initiatives, but the goal is to allow leadership to emerge from the organization at all levels and for that ubiquitous, emergent leadership to be inherently ambidextrous” (Birkinshaw and Gibson, 2004, p. 50). This emergent leadership involves employees choosing how to divide time between *alignment-oriented* activity (e.g., exploiting the value of proprietary assets, rolling out existing business models quickly, taking costs out of existing operations) and *adaptation-oriented* activities (e.g., being nimble, innovative, proactive).

Ambidextrous employees are “sufficiently motivated and informed to act spontaneously, without seeking permission or support from the superiors” (Birkinshaw and Gibson, 2004, p. 50). They recognize the need to aim for adaptability while still remaining clearly aligned with strategy. Leadership of ambidexterity thus involves encouraging ongoing small adaptations that continually update and adapt the strategy without losing alignment (Birkinshaw and Gibson, 2004). To do this, leaders should promote and support initiative taking, cooperation, brokering and multi-tasking. They should also engage in self-criticality (i.e., always looking to improve), as well as an informal style of management encouraging alternative views and novel approaches.

Tension/conflicting

Exploration and exploitation are fundamentally different logics involving very different structures. Therefore, at the core of ambidexterity is tension. According to March (1991), ambidexterity is the “fundamental tension” at the heart of an enterprise's long-run survival. It enables the organization's ability to adapt but can be very hard to reconcile (Tushman and O'Reilly, 1996). It must be well managed or firms may end up worse off (He and Wong, 2004).

When engaged effectively, ambidexterity serves as a synthesizing capability that creates competitive advantage out of conflicting forces (He and Wong, 2004; Nonaka and Toyama, 2003). As described by O'Reilly and Tushman (2008, p. 199):

“At CIBA Vision, the President deliberately included the heads of exploratory units in his senior management meetings and encouraged them to argue their positions with mature business unit leaders. At Analog Devices, Ray Stata described the style needed as an ability to ‘absorb contradictions’ and actually built a sound-proof room where managers could scream at each other... In describing how organizations can compete with dual business models (explore and exploit), Markides and Charitou (2004) underscore the importance of conflict resolution skills, ‘The question is not whether conflict exists...the key question is how well the company manages these conflicts.’”

Lubatkin, Simsek, Ling, and Veiga (2006) similarly recognize the role of conflict in exploration and exploitation, describing exploitation as a *top-down* information flow (e.g., institutionalizing routines and behaviors to refine current competencies) and exploration as a *bottom-up* information flow (e.g., abandoning old routines and making a commitment to a new course of action). Behavioral integration among leaders, particularly those in the top management team (TMT), can help in managing these conflicting forces and tensions (Jansen, Tempelaar, Van den Bosch, and Volberda, 2009). Behavioral integration promotes a collaborative climate to enable adaptability: “[B]ehaviorally integrated teams make better use of knowledge alternatives because cognitive conflict in such teams affords more opportunities to debate and discuss strategic issues” (Lubatkin et al., 2006, p. 651). Behavioral integration also engenders social mechanisms of trust and reciprocity (Granovetter, 1985; Uzzi, 1997). These help the TMT draw from diverse insights and combine the tacit knowledge bases of senior managers. When not present, interaction and collaboration will be lost, and top leaders will be more likely to focus on their own piece of the enterprise (Lubatkin et al., 2006):

“In effect, this scenario reinforces Nonaka’s (1994) argument that ‘although ideas are formed in the minds of individuals, interactions typically play a critical role in developing these ideas,’ and it is through this ‘community of interaction that new organizational knowledge is developed’” (p. 652).

Papachroni, Heracleous, and Paroutis (2016) describe the core tension in ambidexterity as *innovation* versus *efficiency*. Leaders who successfully navigate the innovation-efficiency duality accept the simultaneous existence of these contradictory forces for enabling adaptability (Smith and Tushman, 2005). Tension is not a bipolar “separation” (i.e., paradox) of choosing one side over the other (Andriopoulos and Lewis, 2010). Instead it is “something people do as they are confronted with conflicting pressure” and interactions (Papachroni et al., 2016, p. 1813). Leaders should therefore view ambidexterity not only as a managerial choice between structural options (i.e., strategic choice), but also as a process of enabling human interaction (Gibson and Birkinshaw, 2004; Hotho and Champion, 2010).

Similarly, Andriopoulos and Lewis (2010) describe ambidexterity tension as a paradox, much like that between passion, which “fosters intrinsic motivation that builds commitment and excitement for the work” and discipline, which “channels individuals’ efforts from ideas to fruition” (p. 115). Paradoxical tension is what ultimately drives beneficial outcomes. But benefits come only when tension is engaged effectively. Passion alone can create chaos (e.g., indecisiveness) or burnout; excessive discipline can stifle creativity and innovation. Therefore leadership for adaptability requires leaders to embrace paradoxical thinking, and shift from managerial control mindsets to “managing by all” (Andriopoulos and Lewis, 2010, p. 118).

Integration/linking

In classic perspectives (March, 1991), leaders manage ambidexterity by orienting some units toward exploration and others toward exploitation (i.e., differentiation). The challenge, then, is bringing them back together (i.e., integration) (Lawrence and Lorsch, 1967). In the

strategy and OT literatures, managing differentiation and integration is commonly seen as the role of senior leaders (Benner and Tushman, 2003). They do this by developing and reinforcing a common vision, communicating values, and identifying targeted goals (O’Reilly and Tushman, 2008). Taylor and Helfat (2009), however, show that middle managers also play a critical role in this process. Middle managers act as “organizational connectors” who create linkages that enable transitions from one system to another.

Because top managers often do not know exactly what sort of linkages would work best or how to implement them, the role of senior leaders is enabling middle managers to engage in *linking activities* that help enable adaptability and change (Taylor and Helfat, 2009). Such linking activities can include boundary spanning (e.g., brokering), organizing and implementing aligned actions (i.e., integrating), promoting cross-functional training (e.g., enabling collaboration), joint planning and decision-making (e.g., coordinating), and deploying resources across units in ways that foster interconnectivity.

Jansen et al. (2009) also identify the importance of integration in linking the activities of work units. They propose that leaders at all levels must advocate new organizational logics and foster collective patterns of interaction (Helfat and Peteraf, 2003). Managers should enable cross-functional (i.e., horizontal) linkage devices (Westerman, McFarlan, and Iansiti, 2006) to support the efforts of distributed leaders. They should also carefully design and implement integrating mechanisms (e.g., formal/structural, informal/social) in and across hierarchical levels (Galbraith, 1973; Galunic and Eisenhardt, 2001; Tsai, 2002) to enable ambidexterity.

Jansen, Simsek, and Cao (2012) show that ambidexterity is a complex interaction between firm-level contextual attributes (top-down) and unit-level capabilities (bottom-up). Decentralized structures promote ambidexterity by allowing more flexibility in targeting market opportunities and more timely responses (see also Birkinshaw and Gibson, 2004; Birkinshaw and Lingblad, 2005). Leaders should therefore foster decentralized, rather than centralized, structures.

Cantarello, Martini, and Nosella (2012) also describe ambidexterity as a top-down/bottom-up interaction that generates tension in the dynamic interplay between the needs of managerial (i.e., top-down) and operational (i.e., bottom-up) levels. The tension from this engagement is only beneficial, however, if it is followed by *integration*—the process of achieving unity of effort among the various subsystems of an organization (Lawrence and Lorsch, 1967). In their findings, integration was achieved when the tension between acquired market/technological knowledge (i.e., exploration) and expected results (i.e., exploitation) was “subsequently merged” in meetings at the managerial level (Cantarello et al., 2012, p. 43). Integration was “a vertically imposed bureaucratic process that co-ordinates the efforts of many specialists within the organization, by reconciling the distinct objectives of organizational members...and identifying synergies” (p. 43). Despite their sequential description, they emphasized that this process was a “continuously interacting dynamic” (p. 43).

Reintegration

Durisin and Todorova (2012) extend the discussion of integration to reintegration. Using a concept they term *capability mutations*, they describe how the new capabilities developed in an explorative unit “dis-integrated” as they were incorporated back into the operational core. This resulted from “mutations” (i.e., permanent changes) made to the new capabilities that eliminated their novelty and value as they were integrated into the routines of the old unit. Describing the frustration and disappointment of the organization attempting to apply ambidexterity theory, they concluded that the theoretical proposition to keep units separate and then reintegrate them (Christensen, 1997; O’Reilly and Tushman, 2004) is flawed and needs to be revisited, as it did not lead toward the ambidexterity benefits the organization was seeking.

Siggelkow and Levinthal (2003) used an agent-based simulation to

study issues of reintegration. Focusing specifically on exogenously driven change, they investigate an assumption with deep roots in the literature on complex adaptive systems (Holland, 1995) that adaptive entities maintain a balance of exploration and exploitation. Their findings show that firms achieve this through *temporary decentralization*—when an organization chooses an initial decentralized structure “in order to respond rapidly to the perceived dramatic changes in their performance landscape” (Siggelkow and Levinthal, 2003, pp. 664–5). Following temporary decentralization they move directly into reintegration as they work to resolve coordination challenges created by the initial decentralized structure. This can occur repeatedly as firms cycle through different structures, “pulsating back and forth between decentralization, to ignite new search, and centralization, to increase coordination” (Siggelkow and Levinthal, 2003, p. 665). This concept of dynamic or temporary networks arising and dissipating in response to environmental pressures is also described in Pérez-Nordtvedt, O'Brien, and Rasheed (2013) and Brown and Eisenhardt (1997), and has important implications for leadership of adaptability.

Summary of ambidexterity

Ambidexterity theory shows that balancing the tension between exploration and exploitation (Tushman and O'Reilly, 1996) is key to leadership for organizational adaptability. Exploitation (e.g., using existing knowledge, skills and processes through efficiency and execution) is needed to produce *current results*, and exploration (e.g., generating new knowledge, skills and processes through search, variety, experimentation, risk, discovery and innovation) is needed to sustain *future viability* (Levinthal and March, 1993; March, 1991). Ambidextrous leadership, therefore, involves *adaptation-oriented* and *alignment-oriented* activity. It is not generated through top down leadership, charisma, vision, or management-by-objectives; instead it requires many leaders, working together, across organizational levels (Birkinshaw and Gibson, 2004).

Ambidexterity is a knowledge-based approach (Nonaka, 1994) that describes how organizational knowledge is initiated in ideas formed in the minds of individuals, and developed through communities of interaction (Lubatkin et al., 2006). At the core is tension between innovation (e.g., novelty) and efficiency (e.g., productivity) (Papachroni et al., 2016). For adaptability to occur leaders must engage this tension appropriately. Leaders must allow diverse, seemingly paradoxical, ideas to conflict (i.e., tension) and connect (i.e., link up) in ways that generate emergence of innovation and novelty. Integration is critical to this process, and represents the ways in which leaders bring diverse ideas, activities and units together. Leaders enable integration by acting as “organizational connectors” who create linkages that support transitions from one system to another (Taylor and Helfat, 2009). Leaders also enable integration by advocating new organizational logics and fostering collective patterns of interaction (Galunic and Eisenhardt, 2001; Helfat and Peteraf, 2003; Jansen et al., 2009; Tsai, 2002). For ideas to take hold in a system, leaders must also enable *reintegration*—the incorporation of novelty and new capabilities back into the operational core (Durisin and Todorova, 2012).

Dynamic capabilities

Another major perspective on organizational adaptability in the strategy, OT, and entrepreneurship literatures is research on dynamic capabilities (Augier and Teece, 2009; Teece, Pisano, and Shuen, 1997; Winter, 2003). The theory, which emanates from the resource-based view of the firm (Barney, 1991; Penrose, 1959), classifies capabilities as either operational or dynamic (Winter, 2003). *Operational* capabilities facilitate efficient and effective use of resources (e.g., exploitation); *dynamic* capabilities enable an organization to renew its competences to achieve congruence with the changing environment (e.g., exploration) (Dixon, Meyer, and Day, 2014).

Dynamic capabilities are the firm's ability to build, integrate and reconfigure internal and external competencies in rapidly changing environments (Teece et al., 1997). They represent a broad range of factors, including dynamic learning, ideation, integration, and re-configuration, that enable an organization to adapt and evolve over time (Dixon et al., 2014). The core premise of the theory is that traditional elements of business success (e.g., maintaining incentive alignment, owning tangible assets, controlling costs, maintaining quality, optimizing inventories) are necessary but insufficient for sustained enterprise performance (Teece et al., 1997). For a firm to generate competitive advantage and long-term survival they must carefully orchestrate *both* operational and dynamic capabilities.

Learning is central in the dynamic capabilities approach, and collaborations and partnerships serve as important vehicles for this learning. Local learning, experimentation and collaboration work to enable dynamic capabilities by helping the firm to identify dysfunctional routines, adapt to changing market conditions, and prevent strategic blindspots (Teece et al., 1997). Teece (2007) later refined these components to describe dynamic capabilities as consisting of leaders' capacity to a) *sense* and *shape* opportunities and threats, and b) *seize* opportunities and maintain competitiveness, by c) *enhancing, combining, protecting and reconfiguring* a firm's tangible and intangible assets.

Tension/conflicting

Similar to ambidexterity, tension and dualities are at the core of dynamic capabilities theory. Whereas strategic change is often described as a “carefully orchestrated deployment of resources,” a dualities approach provides an “emergent picture” of organizations as continually adjusting, without “overarching strategic prescriptions” (Graetz and Smith, 2008, p. 277). Graetz and Smith (2008) describe organizing as an ongoing process of equilibrating opposing forces (see also Lewis, 2000). The core challenge for leaders, then, is to develop systems that enable efficiency and innovation by combining centralized purpose with decentralized power (Child & McGrath, 2001).

Capron and Mitchell (2009) highlight the importance of *conflicting* to dynamic capabilities. Conflicting enables effectiveness in problem-solving groups (Jehn, 1997) and helps identify better options (Eisenhardt and Schoonhoven, 1990; McGrath, 1984). Leaders enable processes that favor adaptation by engaging conflicting (Capron and Mitchell, 2009):

“...[A]s well as having a potential for disruption, conflict can help create new views of problems and generate new insights for solutions. Firms that have learned how to take advantage of conflict... may benefit by initiating internal projects in conflict-strewn environments” (p. 308).

Integration

Like ambidexterity, integration is also central to dynamic capabilities. Zahra and George (2002) recognize the role of integration relative to *absorptive capacity*—the ability to value, assimilate and apply new knowledge for learning and problem solving (Cohen and Levinthal, 1990; Kim, 1997; Volberda, Foss, and Lyles, 2010). Absorptive capacity helps organizations adapt and evolve in high-velocity environments (Floyd and Lane, 2000). It does this by focusing leaders on effectively capturing and deploying the firm's knowledge-based assets.

Absorptive capacity is needed when “activation triggers” (e.g., disruptive innovation, technology shifts, regulatory/market change) require a firm to respond (Walsh and Ungson, 1991; Winter, 2003) to pressures from the environment for change. Activation triggers can be internal or external, and intensify the need to learn new skills and act on new knowledge (i.e., absorptive capacity). Because firms are not naturally structured to enable absorptive capacity, leaders need to promote social *integration* mechanisms that facilitate the sharing and exploitation of knowledge (Westerman et al., 2006; Zahra and George,

2002). Social integration mechanisms overcome structural, behavioral, cognitive and political barriers that stifle knowledge and information sharing. They can be informal (e.g., social networks) or formal (e.g., cross-functional teams), and help leaders leverage intellectual and social capital assets that generate adaptive problem solving and creative action (Nahapiet and Ghoshal, 1998).

Endogenous entrepreneurship

Consistent with the idea that activation triggers can be internal or external (Zahra and George, 2002), Newey and Zahra (2009) show that dynamic capabilities are often generated through a firm's endogenously-driven entrepreneurship, even without an exogenous shock (Schreyögg and Kliesch-Eberl, 2007). Exogenous shocks generate a reactive response, while endogenous entrepreneurship allows a firm to adapt more proactively (Newey and Zahra, 2009). They define *endogenous entrepreneurship* as initiatives in developing new products, services and or/business arising from internal opportunity recognition.

Using the concept of endogenous entrepreneurship, Newey and Zahra (2009) suggest that the interaction between operating capabilities and dynamic capabilities, and not the action of dynamic capabilities alone, is key to adaptability in a firm's evolution. A well-functioning *adaptive capability* requires organizational mechanisms for enabling: (1) learning at the operating capability level (e.g., product development), (2) capturing the learning at the dynamic capability level (e.g., innovation and emergence of new ideas), and (3) re-configuration of operating capabilities (e.g., getting the changes into the system in the form of new order). Within this process, absorptive capacity develops within value networks: “products develop within a web of internal and external stakeholders and this web can differ across different product categories” (p. S91). Leaders, therefore, need to develop relationships with and learn about the needs of stakeholders (e.g., consumers, suppliers, regulators and lead users).

In Newey and Zahra's (2009) approach, *managers* should build and leverage operating and dynamic capabilities that identify and enable emergence of new opportunities; endogenous entrepreneurs, i.e., *entrepreneurial leaders*, should engage effort and energy that promotes and facilitates adaptation from within the system. This is consistent with Teece et al.'s (1997) view that “the element of dynamic capabilities that involves shaping (and not just adapting to) the environment is entrepreneurial in nature” (p. 1321). According to Teece et al. (1997), “entrepreneurial fitness ought to have equal standing with evolutionary fitness” (p. 1321). For this to occur, managerial and entrepreneurial leaders must remain mindful of the traps that work against an entrepreneurial mindset, e.g., routinization, that overemphasize structural rigidity and ignore the capacity of agents to think outside the box (Newey and Zahra, 2009).

The adaptive process

Cepeda and Vera (2007) identify four critical aspects of dynamic capabilities that provide insight into how the adaptive process works:

“(1) Capabilities are organizational processes and routines rooted in knowledge, (2) The input of dynamic capabilities is an initial configuration of resources and operational routines, (3) Dynamic capabilities involve a transformation process of the firm's knowledge resources and routines, and (4) The output of dynamic capabilities is a new configuration of resources and operational routines” (p. 427).

Knowledge management (KM) is crucial to this adaptive process. To enable dynamic capabilities associated with the adaptive process, leaders should create a learning culture in which individuals can speak openly about knowledge requirements and take steps to implement knowledge in support of firm goals (Cepeda and Vera, 2007). These can include KM practices (e.g., repeated practice, improvisation, learning-by-doing, experimentation, trial-and-error) or KM processes (e.g., “knowledge evolution cycle,” Zollo and Winter, 2002 or “combinative capabilities,” Kogut and Zander, 1992). Helfat et al. (2007) also use

knowledge to explain the role of dynamic capabilities in adaptation. They describe the importance of *value network absorptive capacity* (routines for acquiring, assimilating, transforming and exploiting knowledge specific to a value network) in the interaction between operating and dynamic capabilities:

“...it is not just dynamic capabilities that assist the organization to adapt and evolve but also how well the operating capability performs after reconfiguration or development and how well this performance leads to further learning that informs the future actions of the dynamic capability, thereby continuing the adaptive cycle” (p. S83).

The adaptive process starts with ideas. Björk, Boccardelli, and Magnusson (2010) describe this as *ideation capabilities*—the organization's capacity to generate and develop ideas that can be converted into innovations. Ideation capability goes beyond individual creativity to understand the process through which ideas can be generated, combined and transformed into useful adaptations for the firm. Because too much formalization can be harmful, leaders must delicately balance formal (e.g., formal structures and systems) and informal (e.g., social networks, both internal and external) sources of ideation. They should also “bound” ideation conditions, meaning stimulating ideas by engaging appropriate limitations and boundaries. Climates and incentives are needed to support ideation capabilities. Leaders must establish the right incentives, combined with supportive systems, processes and roles, to help generate a multitude of ideation approaches, across both individual and collective processes.

Salvato (2009) reveals how the daily actions of individuals engaged in experimentation and adaptation constitute process “heterogeneity,” which leaders can then use to generate “homogeneous, semiautomatic” processes (i.e., new order). Salvato's (2009) findings indicate that organizational adaptation comes from an ongoing, dynamic process in which: a) established capabilities, which function as semi-automatic, less mindful activities, are reshaped in mindful, ordinary acts carried out by individuals acting with the aim to improve organizational processes (cf. Levinthal and Rerup, 2006; Weick and Sutcliffe, 2006); and b) timely leadership interventions take the novelty generated by the actions of these individuals and encode them into higher-level organizational capabilities. Together, these bottom-up and top-down processes promote the adaptive capability (i.e., the adaptive process) in a firm.

In this adaptive process *employees* engage in experimentation that generates new learning and ways of operating. *Leaders* help capture the learning and integrate it into the operating system to generate adaptive outcomes for the firm (Salvato, 2009). Enabling adaptive capabilities, therefore, requires leaders to recognize potentially valuable experiments happening at all levels, within and outside the organization, and to encourage and motivate all units and external collaborators to actively participate in experimenting to identify novel solutions within the ongoing functioning of capabilities (Salvato, 2009). Given that formalization can hurt these dynamics, the capabilities must be adaptive: “interpretation of local experiments should be run by top managers as an ad hoc problem solving, rather than by establishing innovation routines and operating rules” (Salvato, 2009, p. 403).

Allred, Fawcett, Wallin, and Magnan (2011) provide insight into how dynamic capabilities are associated with the adaptive process. They introduce *collaboration capability* and describe it as a rare and valuable asset for an organization. Firms that have high collaboration capability: a) improve information sharing (e.g., enable information flows), b) promote boundary-spanning initiatives (i.e., networking) of employees and units, c) invest in collaborative people skills, and d) align goals and metrics to foster collaboration. This involves changing structures and mindsets. Leaders increase collaboration capability by a) bringing people together to engage around problem solving, innovation and decision making (i.e., structural enablers), b) devoting time and resources to enhance collaboration, e.g., through collaborative pilot

projects, and c) investing in adaptive skills that help collaborative champions break down resistance to change.

Summary of dynamic capabilities

Dynamic capabilities theory brings a perspective of leadership as enabling an organization's ability to adapt and evolve over time (Dixon et al., 2014; Teece et al., 1997). Its core premise is that traditional elements of business success (e.g., operational capabilities) are not enough. Leaders must instead carefully orchestrate both operational and dynamic capabilities (Teece et al., 1997). Operational capabilities work to facilitate efficient and effective use of resources (i.e., current results), while dynamic capabilities allow an organization to renew in accordance with the changing environment (i.e., future viability) (Dixon et al., 2014).

The role of leaders from this perspective is to sense and shape opportunities and threats; seize opportunities and maintain competitiveness; and enhance, combine, protect and reconfigure the firm's tangible and intangible assets (i.e., operational and dynamic capabilities) (Teece, 2007). Like ambidexterity, knowledge and learning are central to the dynamic capabilities approach. Collaborations and partnerships, along with local learning, experimentation and collaboration, are vehicles through which leaders enable learning. For learning to occur, leaders must support the careful engagement of conflicting (i.e., tension) (Capron and Mitchell, 2009; Graetz and Smith, 2008) and connecting (i.e., integration) (Zahra and George, 2002). This allows leaders to enable the adaptive process in organizations (Cepeda and Vera, 2007).

The adaptive process starts with “activation triggers” that pressure the organizational system for change (Newey and Zahra, 2009; Walsh and Ungson, 1991; Winter, 2003). These triggers can be external (e.g., disruptive innovation, technology shifts, regulatory/market change) or internal (e.g., new ideas for products, services or businesses generated internally by endogenous entrepreneurs responding to changing environments or opportunity recognition). To respond to triggers, leaders need to support a well-functioning *adaptive capability* to: (1) foster learning at the operating capability level (e.g., product development), (2) capture the learning at the dynamic capability level (e.g., innovation and emergence of new ideas), and (3) reconfigure operating capabilities (e.g., getting the changes into the system in the form of new order). Ideation capabilities (Björk et al., 2010), collaboration capabilities (Allred et al., 2011) and value network absorptive capacity (Helfat et al., 2007) all help with this.

Innovation and networks

According to Schumpeter (1949), organizational survival depends on the ability to adapt to a changing environment. Therefore, innovation is essential for a firm's adaptive capacity. Innovation serves as an engine for growth (Volberda, Van den Bosch, and Mihalache, 2014), a source of renewal (Sidhu, Commandeur, and Volberda, 2007), a dynamic capability (Teece, 2007), and a generator of requisite internal variety needed for ambidexterity (Sidhu et al., 2007). Innovation alone is not enough, however. It operates as part of a larger adaptive process that effectively converts the generation and incorporation of novelty and learning into productive and adaptive outcomes for the firm (Subramaniam and Youndt, 2005). For this to occur, an organization must enable relational and network dynamics.

Research shows that the innovation process occurs in phases: idea generation, idea elaboration, championing/amplification, and adoption/implementation (Damanpour and Schneider, 2006; Perry-Smith and Mannucci, 2017). Creativity scholars primarily focus on the early (idea generation) stages of this process, and innovation scholars stress the latter stages (i.e., implementation) (Perry-Smith and Mannucci, 2017). The two are closely related: Organizational creativity is defined as “the creation of a valuable, useful new product, service, idea, procedure, or process by individuals in a complex social system”

(Woodman, Sawyer, and Griffin, 1993, p. 293), and organizational innovation defined as the “adoption of a new product, service, process, technology, policy, structure or administrative system” (Damanpour and Schneider, 2006, p. 216).

The role of networks in the innovation process

Perry-Smith and Mannucci (2017) show how leaders can foster innovation by enabling network structures and roles. Mapping network theory onto the innovation process, they argue that dyadic tie strength (e.g., emotional closeness, duration and frequency, Granovetter, 1973) is critical in facilitating the micro needs of the early innovation process (i.e., idea generation and elaboration), while network structure (e.g., ego network and structural holes, Burt, 1992, 2005) is critical in navigating the social dynamics in the latter stage (i.e., championing and implementation). At the *idea generation* phase, weak ties will facilitate idea generation through brokerage (Burt, 2004; Fleming, Mingo, and Chen, 2007). At the *idea elaboration* phase, feedback and encouragement from a limited number of strong ties (e.g., one or two) or a trusting and safe environment of network cohesion (Burt, 2005) is beneficial. In the *championing* phase, brokerage again helps garner support for ideas and initiatives (Burt, 1992; Seibert, Kraimer, and Liden, 2001). This is because idea creators will likely not be able to do this themselves and will need to “borrow” influence and legitimacy from another to sell the idea (Perry-Smith and Mannucci, 2017). In the *implementation* phase, network closure (i.e., few structural holes) provides normative pressure to work collaboratively toward common objectives. It also enhances information sharing (Granovetter, 1985; Uzzi and Spiro, 2005) and reduces perceived uncertainty by drawing on others' behavioral cues.

Leaders, therefore, need to understand that *network features that work at one stage will not work at another*: As “the idea progresses across phases, the primarily beneficial network characteristics reverse” (Perry-Smith and Mannucci, 2017, p. 61). Cognitive frames play an important role in this process. At the idea generation phase, *strategic framing* (i.e., rationality, planning, information collection and aligning with organizational goals, Bridwell-Mitchell and Lant, 2014; Gioia and Thomas, 1996) is beneficial; in the elaboration phase, *political framing* (i.e., emphasizing the negotiation process) is more effective. Because each idea journey is unique, networks must be fluid, and leaders must continually reconstruct and activate networks in accordance with the situation. This activation fluidity, i.e., activating different networks in different phases, typically cannot be achieved by one leader (Perry-Smith and Mannucci, 2017). Therefore, multiple leaders with diverse skills are needed to take on the varying roles (Arena, Cross, Sims, and Uhl-Bien, 2017).

Individual differences play a part in this process (Carnabuci and Diószegi, 2015). Social networks rich in structural holes are more amenable to innovation for leaders with an *adaptive* cognitive style (“doing things better”). Closed networks with densely interconnected contacts are more amenable to leaders with an *innovative* cognitive style (“doing things differently”). This is because *innovators* are better at recombining seemingly unrelated perspectives and information, while *adaptors* come up with fewer and less original ideas but are better able to find solutions that are implementable. Therefore leaders need to consider cognitive styles when working to activate the networked innovation process.

Soda and Zaheer (2012) apply *network architecture* to show how organizations can combine “informal social networks with formal organizational structures and processes to leverage the organization's multiple networks into value-creating capabilities” (p. 766). Specifically, they find an inverted U-shaped relationship between congruence and performance: Incongruence between formal and informal a) hurts performance by reducing coordination, but b) helps innovation by enhancing access to diverse information, ideas and knowledge dispersed throughout the organization. Thus, leaders need to consider that when the coordination problem is complex, “the different networks that

individuals can draw upon are sources of differentiated resource access, and it is complementarity from inconsistency, rather than from fit in terms of alignment or coherence or consistency, that creates value” relative to adaptability (p. 767).

Finally, the innovation process relies on *knowledge transfer*—units learning from each other and benefiting from knowledge developed by other units (Kogut and Zander, 1992; Tortoriello, Reagans, and McEvily, 2012; Tsai, 2001). Knowledge transfer “occurs in a shared social context in which different units are linked to one another” (Tsai, 2001, p. 996). Leaders enable knowledge transfer by creating network structures that allow discovery of new opportunities, knowledge, and learning. Moreover, a growing body of work on management innovation (Peeters, Massini, and Lewin, 2014; Volberda et al., 2014) identifies two meta-routines relevant to leadership of organizational adaptability. *Managing adaptive tension* involves stimulating internal innovation processes in accordance with demands from the environment (e.g., increasing tension when more innovation is needed), and *transferring knowledge back to the organization* involves assimilating externally acquired knowledge.

Complexity

Complexity theory offers insight into leadership for adaptability using the concepts of complex adaptive systems and emergence (Uhl-Bien et al., 2007; Uhl-Bien and Marion, 2009). In the earliest application of complexity to organization science, Stacey (1995) argued that complex adaptive systems offer superior understanding of adaptability compared to strategic choice and ecology views that see organization as tending toward *equilibrium* (e.g., stability, predictability, regularity). Complexity sees strategic change as occurring in *far-from-equilibrium* states (e.g., instability, unpredictability, dynamism). These states are primarily generated in the informal, networked systems and not the formal, bureaucratic systems of organizations (Stacey, 1995).

In complexity, emergent order (i.e., adaptability) comes from the simultaneous presence of *disturbing elements* that push a system toward chaos, and *stabilizing elements* that push toward order (Chiles, Meyer, and Hench, 2004). Disturbing elements include forces such as pressures, innovation, conflict, tension or energy flows. Stabilizing elements include structures, planning and control (Thietart and Forgues, 1995). Without disturbing elements (i.e., pressures) the system would stay in equilibrium; without stabilizing elements the system would go into chaos (i.e., no new order would emerge). As described by Stacey (1995):

“The transformational process is one of internal, spontaneous self-organization amongst the agents of a system, provoked by instabilities, and potentially leading to emergent order....The dynamics of success then have to do with being kept away from equilibrium adaptation in states of instability, irregularity and unpredictability” (p. 478).

From this perspective, the role of the leader is to accept and even promote uncertainty, surprise, unknowability, and open-endedness. Rather than focusing on leaders only at the top, complexity considers leadership occurring amid group dynamics, and in the spontaneously self-organizing political and organizational learning processes through which innovation occurs (Marion and Uhl-Bien, 2001; Stacey, 1995).

Complex adaptive systems approaches focus on how leaders affect and are affected by the informal networks in which they take part, and how they use networks to advance innovation through conflict and dialogue within boundaries (Carley and Lee, 1998; Stacey, 1995; Uhl-Bien and Marion, 2009). Similarly, co-evolutionary perspectives (Volberda et al., 2014) show that as managers respond to the environment by changing their organizations through management innovations, these changes subsequently influence the environment. These processes are simultaneously evolving and co-evolving (Volberda and Lewin, 2003), with change at one level triggering further change at

other levels (Aldrich, 1999). Therefore, leaders need to be prepared to approach adaptability as a multilevel and dynamic process that is impacted by change agents from both within and outside the firm.

Semisttructures

Using a complexity lens, Brown and Eisenhardt (1997, 1998) depict high-velocity organizations as operating in *dynamic equilibrium*—conditions in which change is ongoing and continual. In environments of dynamic equilibrium, leaders need to position organizations as “semistructured” rather than over-structured (e.g., mechanistic) or under-structured (e.g., organic). Such organizations are poised at the “edge of chaos that exists between order and disorder” (p. 29), with managers constantly vigilant “to avoid slipping into pure chaos or pure structure” (p. 29). Unsuccessful managers of dynamic equilibrium are those who engage in too much structuring. They begin with the future in mind, develop a strategy, engage in planning and visioning, and then work to execute (Brown and Eisenhardt, 1997). This over-structuring is problematic because it bogs down in implementation and the day-to-day. Organizations that do this are continually waylaid by problems and have an obsessive focus on current revenues rather than ongoing viability (Levinthal and March, 1993).

In semisttructures, successful managers neither rigidly plan nor chaotically react. Instead they enable adaptability by working to eliminate lockstep bureaucracy, increase communication, and add project-level responsibilities. They also “choreograph” transitions between past and future projects in ways that are neither haphazard, nor rigid (Brown and Eisenhardt, 1998). According to Eisenhardt and Tabrizi (1995), in fast-paced environments structures must combine elements of both adaptation and formal control. This approach led them to question traditional depictions of organic processes as lacking structure (Burns and Stalker, 1961; Lawrence and Lorsch, 1967). Rather than lacking structure, “organic” organizations are improvisational: They enable real-time learning, through design iterations and testing, with a focus and discipline of milestones. Instead of suppressing information flows and conflict, leaders in these systems work to enable interaction, intuition and improvisation. They combine flexibility with reporting relationships that have final decision-making authority (Browning, Beyer, and Stetler, 1995).

Emergence

A key contribution of complexity to organization science is the concept of emergence (Goldstein, 2007; Lichtenstein, 2014). In *emergence*, order arises from the actions of interdependent agents who pursue change based on local knowledge and feedback from others (Chiles et al., 2004; Hayek, 1988; Stacey, 1995; Tsoukas and Chia, 2002). It occurs when “system-level order spontaneously arises from the action and repeated interaction of lower level system components without intervention by a central component” (Chiles et al., 2004, p. 502; see also Lichtenstein, 2000; Plowman et al., 2007).

Emergence dynamics include social mechanisms such as conflicting constraints (i.e., tension/conflicting) and amplification (i.e., integration/linking) (Lichtenstein and Plowman, 2009; Marion and Uhl-Bien, 2003; Plowman et al., 2007; Uhl-Bien et al., 2007). *Conflicting constraints* help foster generation of new ideas and initial adaptations. They occur when interacting agents are brought together by common need (i.e., an adaptive challenge) and must work through heterogeneity (i.e., differences in needs, perspectives and worldviews) to produce an adaptive response to a complexity pressure (Marion and Uhl-Bien, 2001). *Amplification* occurs when individuals link up through networks in ways that help an idea (or novelty) gain momentum and flow (Marion and Uhl-Bien, 2001).

As described in Lichtenstein and Plowman (2009), leaders foster amplification by allowing experiments, encouraging rich interactions, and supporting collective action (see also Lichtenstein, 2000). Learning is a byproduct of these complexity dynamics. According to Fonseca (2002), knowledge emerges as individuals and social settings interact

and create meaning, and learning occurs when ideas collide, combine, diverge, elaborate, or are extinguished. Hence, amplification depends on knowledge, learning, information flows (i.e., networks), and conflicting (i.e., adaptive tension).

Summary of innovation, networks and complexity

Innovation, networks and complexity allow us to see leadership for organizational adaptability as enabling an organization to operate as a complex adaptive system by leveraging network dynamics and structures. Complex adaptive systems are those that adapt and evolve with the environment (Holland, 1995, 1998). Complexity is triggered when pressures come in from the environment (Stacey, 1995), and in response to these pressures, leaders must enable the system to adapt by fostering networked interactions that support and sustain the innovation process (Perry-Smith and Mannucci, 2017) and generate adaptive responses. They do this by keeping the organization in dynamic equilibrium (Brown and Eisenhardt, 1997, 1998), or “far-from-equilibrium” states, that engage the simultaneous presence of *disturbing elements* (push toward chaos) and *stabilizing elements* (push toward order) (Stacey, 1995). Together, these elements occurring in contexts of networked interactions create the forces that trigger self-organization toward new, emergent order (i.e., adaptability) (Chiles et al., 2004).

Leaders enable complex adaptive systems by creating semistructures (Eisenhardt and Tabrizi, 1995) that promote interaction, intuition and improvisation. Critical issues for leaders from the perspective of innovation, networks and complexity are network architecture (Soda and Zaheer, 2012) and knowledge transfer (Kogut and Zander, 1992; Tortoriello et al., 2012; Tsai, 2001). Leaders must appropriately leverage brokerage, cohesion, and network closure to trigger, amplify and scale new ideas into the organizational system (Burt, 2005; Perry-Smith and Mannucci, 2017). Network architecture can also involve using the right combination of individual differences (e.g., cognitive styles, Carnabuci and Diószegi, 2015) along with leaders who work to champion innovation. To do this leaders must know how to appropriately frame and position new ideas in the larger, strategic context (Perry-Smith and Mannucci, 2017). Similar to ambidexterity and dynamic capabilities, leadership for organizational adaptability involves *managing adaptive tension* (stimulating internal innovation processes in accordance with demands from the environment) and *transferring knowledge back to the organization* (e.g., reintegration and knowledge transfer) (Peeters et al., 2014; Volberda et al., 2014).

Theoretical synthesis and integrative framework

Although organizational adaptability is studied across a variety of literatures and disciplines, our review shows that there is surprising similarity across perspectives. In this section we begin by providing a theoretical synthesis that combines the implications of the perspectives summarized above. We do this using a series of figures. We then synthesize the figures into an integrative “meta-framework” of leadership for organizational adaptability.

Synthesizing the theoretical perspectives on organizational adaptability

As shown in Fig. 1, organizational adaptability is characterized by a core tension between “the need to innovate” and “the need to produce” (Tushman and O’Reilly, 1996). This tension is labeled differently depending on the perspective it comes from (e.g., strategy, OT, entrepreneurship, learning). Adaptability occurs in the interface between these tensions, and is associated with “new organizational forms” (Lewin and Volberda, 1999) that arise to navigate in this space and integrate across the differences. These forms, or processes, are ambidextrous (O’Reilly and Tushman, 2008) and fluid (e.g., semistructures, Brown and Eisenhardt, 1998; absorptive capacity, Zahra and George, 2002). They dynamically change and adjust (i.e., adapt) to meet the needs of pressures (i.e., activation triggers, Newey and Zahra, 2009)

coming in from the internal and/or external environment (Nickerson and Zenger, 2002; Siggelkow and Levinthal, 2003).

The adaptive process involves transforming organizations from one state to another to enhance fitness with the environment (Cepeda and Vera, 2007; Newey and Zahra, 2009; Salvato, 2009). This can be a radical transformation in response to an exogenous shock (Newey and Zahra, 2009), a restructuring process, an emergent innovation process (Perry-Smith and Mannucci, 2017; Peschl and Fundneider, 2008), endogenous entrepreneurship (Newey and Zahra, 2009), or an ongoing transformation resulting from everyday adjustments made by people as they engage in work activities (Tsoukas and Chia, 2002). As shown in Fig. 2, it involves an initial configuration of resources and operating routines that go through a transformation that reconfigures them into a new operating system (Cepeda and Vera, 2007). This adaptive process depends on knowledge, learning and information flows (e.g., knowledge transfer, knowledge spillovers) that enable generation and emergence of novelty (Reagans and McEvily, 2003; Rosenkopf and McGrath, 2011) and innovation (Tsai, 2001).

Because bureaucratic (i.e., formal) organizing structures can stifle information flows and interactions needed for adaptability, networks (i.e., informal structures) are needed to open them back up (see Fig. 3) (Soda and Zaheer, 2012). Social networks emerge in organizations in the informal organization that links people, information and resources internally and externally (Burt, 2005). These linkages provide the basis for activating and amplifying the innovation and adaptation process (Perry-Smith and Mannucci, 2017; Tsai, 2001). For example, network structures trigger ideas through brokering, elaborate ideas through strong ties and cohesion, amplify and champion ideas across a system through brokerage, and promote the adoption and implementation of novelty and innovation through network closure (Burt, 1992; Perry-Smith and Mannucci, 2017). This process occurs across time, starting with idea generation, and proceeding into elaboration, championing/amplification, adoption and implementation (Perry-Smith and Mannucci, 2017). In large-scale organizational change it involves different people at multiple levels, with appropriate innovation and networking skills, and requires leaders who can catalyze the emergent innovation process by understanding and tapping the power of employee networks (Arena et al., 2017).

The adaptive process requires that organizations move away from status quo. Most organizations, however, are designed as complex systems rather than complex *adaptive* systems (Stacey, 1995). Complex systems differ from complex adaptive systems in that they are structured for efficiency and control, rather than adaptability (Brown and Eisenhardt, 1997; Eisenhardt and Tabrizi, 1995). This leads to the problem of core rigidities (Leonard-Barton, 1992) in which organizations pull back to equilibrium, even in the face of complex challenges from the environment (Stacey, 1995). Complex adaptive systems overcome this problem by enabling “adaptive space” (Arena et al., 2017; Uhl-Bien and Arena, 2017) that generates adaptability in the interface between the competing demands of exploration (i.e., entrepreneurial activity) and exploitation (i.e., operational core) (see Fig. 4). Adaptive space engages the tension (e.g., conflicting) created by these pressures and uses integration mechanisms (e.g., connecting) to enable emergence of adaptive responses (e.g., knowledge, innovation, learning) that can be implemented into the operating core in the form of new adaptive order (i.e., new configuration of resources and operating routines, Cepeda and Vera, 2007).

With this as a basis, we can now extend the findings to offer an integrative meta-framework of leadership for organizational adaptability.

Integrative meta-framework of leadership for organizational adaptability

A review of the leadership literature shows that organizational adaptability has not been a primary topic in leadership research. Leadership scholars have considered individual adaptability (Chan,

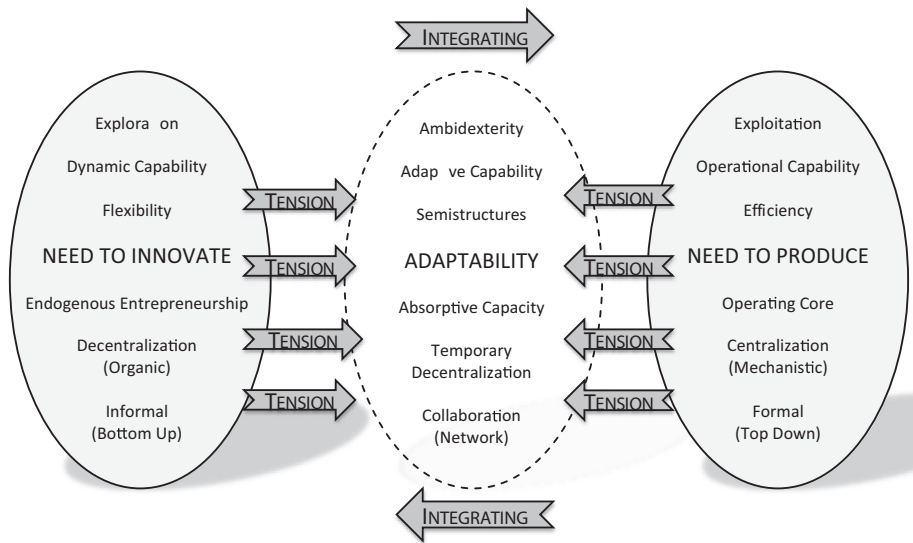


Fig. 1. Theoretical perspectives on organizational adaptability.

Dynamic Capabilities Transformation Process

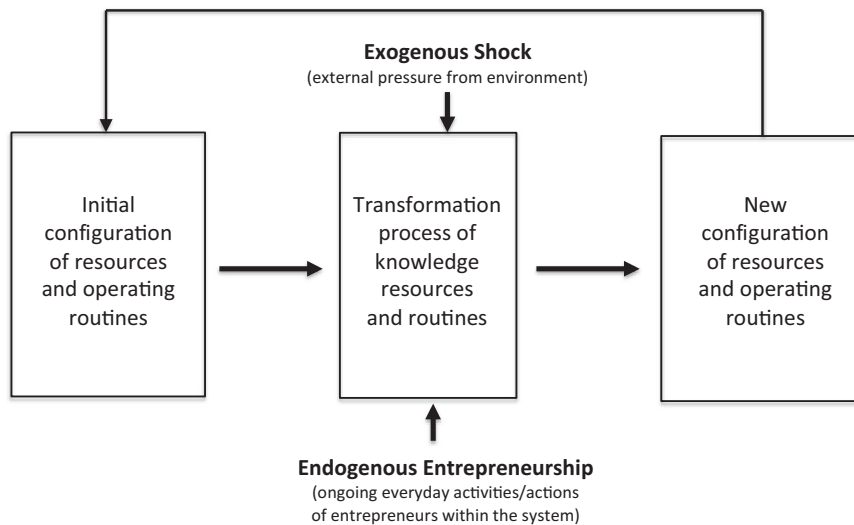


Fig. 2. Dynamic capabilities transformation process.

The Networked Innovation Process

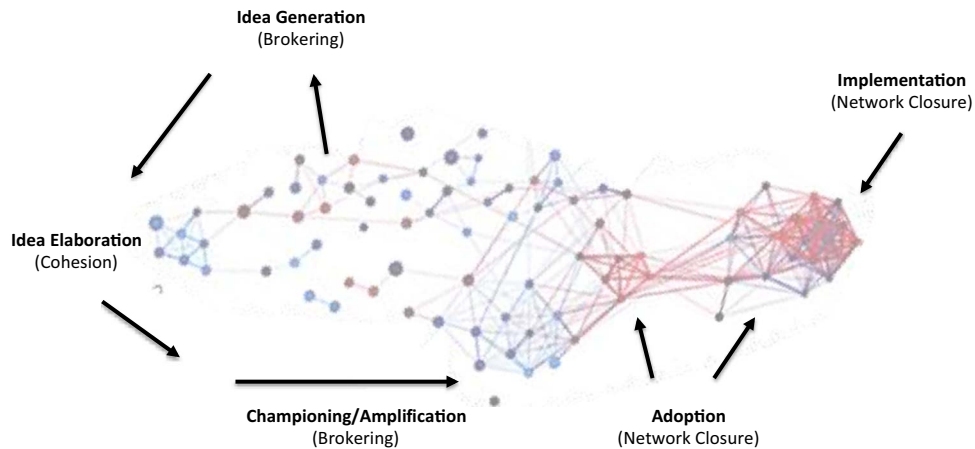


Fig. 3. The networked innovation process.

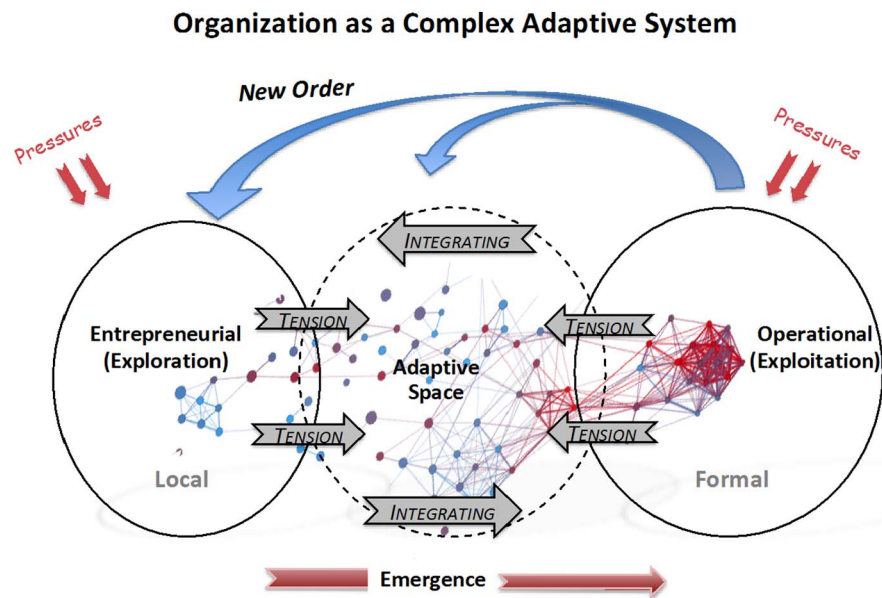


Fig. 4. Organization as a complex adaptive system.

2000; Denison, Hooijberg, and Quinn, 1995; DeRue, Ashford, and Myers, 2012), team adaptability (Porter, Webb, and Gogus, 2010; Randall, Resick, and DeChurch, 2011), leader ambidexterity (Havermans et al., 2015; Rosing et al., 2011; Turner et al., 2013), and networks (Balkundi and Kilduff, 2006; Li, 2013; Marion et al., 2016), but discussions of leadership for *organizational* adaptability are largely missing. An exception is complexity leadership theory (Uhl-Bien et al., 2007; Uhl-Bien and Marion, 2009). Complexity leadership theory “enables the learning, creative and adaptive capacity of complex adaptive systems (CAS) in knowledge-producing organizations” (Uhl-Bien et al., 2007, p. 304). As such, it addresses organizational adaptability similar to the literatures reviewed above. By combining it with the perspectives developed from our theoretical synthesis, it can serve as the foundation for a framework of leadership for organizational adaptability.

Complexity leadership theory describes three forms of leadership: adaptive leadership, administrative leadership and enabling leadership (Uhl-Bien et al., 2007). When considered relative to our review above, we see that these descriptions and labels are not quite accurate, and can benefit from grounding in theoretical perspectives on organizational adaptability. Specifically, from Fig. 1 we can see that adaptability needs to move to the middle of the model rather than in the exploratory function as described in Uhl-Bien et al. (2007). Adaptive leadership thus needs to be relabeled. Drawing from Zahra’s concept of endogenous entrepreneurship (see Fig. 2) we can label it *entrepreneurial leadership* (see also Augier and Teece, 2009; Birkinshaw and Gibson, 2004; Newey and Zahra, 2009), and define it as leadership that works to create new knowledge, skills, products and processes to sustain the future viability of the firm (i.e., exploration) (March, 1991). Administrative leadership is positioned properly but the label is problematic given that it can be confused with administrative roles. Drawing from the strategy literature and Fig. 4, we can more appropriately label this *operational leadership*, and define it as leadership in the formal systems, structures and processes that produces results through selection, refinement, execution and efficiency (i.e., exploitation) (March, 1991).

Enabling leadership is appropriately labeled and positioned, but we can now refine the description to better explain its function in enabling organizational adaptability (see Figs. 3 and 5). *Enabling leadership* is creating, engaging and protecting “adaptive space” (Uhl-Bien and Arena, 2017) needed to nurture and sustain the adaptability process in organizations. Leaders enable adaptive space (middle circle in Fig. 5) and the adaptive process by creating structures and processes (e.g., semistructures, temporary decentralization, collaboration, brokering,

network cohesion, adaptive capabilities, absorptive capacity) that effectively engage conflicting (i.e., tension) and connecting (i.e., integration) to trigger and amplify emergence (i.e., innovation, adaptive responses) into new adaptive order (i.e., reintegration) for the organization (i.e., transformation process in Fig. 2).

The result is an integrative “meta-framework” of leadership for organizational adaptability (see Fig. 5). This framework allows us to see the role of leadership in enabling the adaptive process in organizations. The adaptive process relies on transformation that comes from new knowledge, information, innovation and learning. Therefore, leadership for organizational adaptability requires: a) entrepreneurial leadership (e.g., endogenous entrepreneurship), b) enabling leadership that enables the adaptive process through adaptive space, and c) operational leadership that accommodates novelty (e.g., reintegration) by incorporating it into the operational core in the form of new adaptive order. It is important to note that this is not a hierarchical process; it can occur at any level and individuals in any position (informal or formal leaders) can engage in it. Entrepreneurial leadership does not assume bottom-up—in fact, it is quite often initiated at the top (e.g., Steve Jobs, Larry Page, Jeff Bezos). Even in cases where the top leader is initiating it, however, the challenges are still the same: The entrepreneurial idea has to be advanced into the operational system, and this is a process that occurs in and through adaptive space (see Fig. 5).

Leadership for organizational adaptability

Leadership for organizational adaptability focuses on enabling the adaptive process in organizations (see Fig. 5). At its core, the adaptive process is about engaging the tension between the need to innovate and the need to produce (March, 1991). This occurs when entrepreneurial leaders advance new ideas that “conflict” with the operational system (e.g., ideas are not easily implementable, cost too much money, require resources the organization does not currently have, or go against the organization’s predominant identity) and get reconfigured into better ideas (e.g., new product, processes, services, technologies, market directions) that are then scaled into the formal system (e.g., aligned and executed) by operational leaders acting as sponsors for the innovation. Enabling leaders help in this process by creating the conditions (i.e., adaptive space) for *conflicting* and *connecting* to trigger, energize, amplify and scale ideas into new order (i.e., emergence) in cadence with the adaptive needs of the organization and its environment (see Fig. 5).

While some describe the challenge of conflicting as lying in its

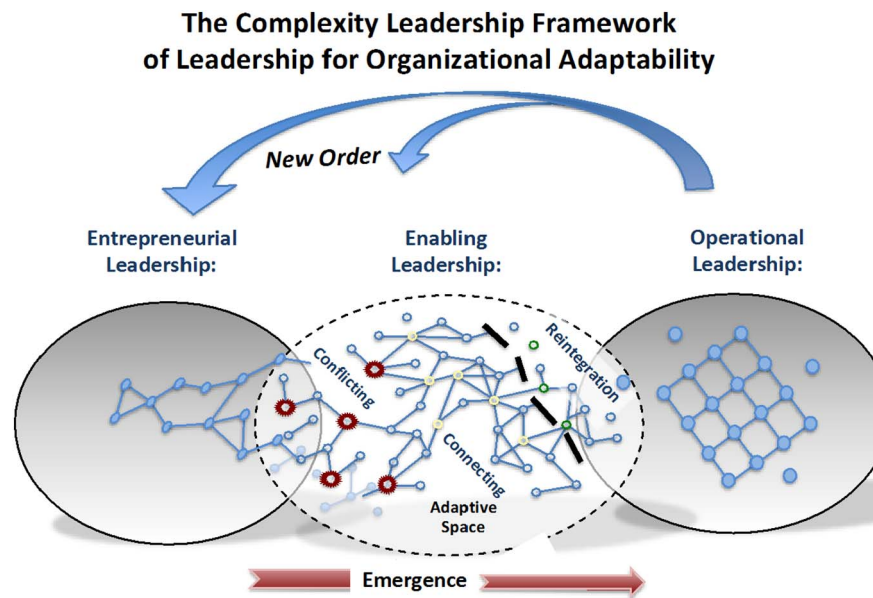


Fig. 5. The complexity leadership framework of leadership for organizational adaptability.

paradoxical nature (Lewis, 2000), perhaps the bigger challenge in engaging this tension is in not letting the pressure to produce overwhelm the need to innovate. Because most organizations are designed for stability they are proficient at rejecting new ideas and change (Leonard-Barton, 1992). The formal structure is designed to suppress the informal structure of networked interactions. Moreover, managers are trained in hierarchical leadership with a bias toward order and a focus on top-down control. This is compounded by reward systems that incentivize productivity at the expense of adaptability.

The result is that most organizations are set up to pull back to equilibrium (Stacey, 1995). It isn't a matter of leaders not visioning well enough or employees being resistant to change; it is fundamentally an issue of structure and design. This is why we see so many organizations turning to “new organizational forms” (Lewin and Volberda, 1999). What these forms are doing is helping enable adaptability by opening up space for the adaptive process in the context of formal organizational structures. To advance understanding of leadership for adaptability, then, we need to focus research on identifying ways in which leaders promote the adaptive process through enabling adaptive space (cf. Uhl-Bien et al., 2007; Uhl-Bien and Marion, 2009).

Enabling adaptive space

Leaders enable adaptive space by engaging conflicting and connecting to advance ideas into the operational system that lead to new adaptive order (see Fig. 5). This can occur in multiple ways, and much of what we need to know regarding it can be found in literatures scattered across strategy, OT and OB. Because we do not have room to go into these issues in-depth here, below we highlight how these processes work.

Conflicting

Conflicting involves engaging tension (e.g., between the pressure to innovate and the pressure to produce) to generate the emergence of higher-order, adaptive outcomes (see Fig. 5). In conflicting, agents (e.g., people, ideas, information, technology) engage heterogeneity (e.g., differences in worldviews, training, perspectives) under conditions of interdependence (i.e., they must work together) to search for creative and adaptive solutions to problems (Uhl-Bien and Marion, 2009). These problems can be generated internally (e.g., entrepreneurial actors motivated to advance novel ideas) or come from the environment (e.g., complexity pressures requiring adaptation from

the system) (Newey and Zahra, 2009). Because conflicting is hard, it usually requires pressures (i.e., disruption) and interdependence to sustain it until a solution is produced (Uhl-Bien and Arena, 2017). Pressures also bound (Björk et al., 2010) the system to shape outcomes that are more adaptive, i.e., conflicting without pressures can generate solutions that are creative but not necessarily productive or adaptive for the system (Havermans et al., 2015 describe this as “loosening” and “tightening”).

Leaders enable conflicting by creating adaptive space—e.g., ways for heterogeneous (i.e., diverse) agents to come together, engage in tension, and link up around an adaptive solution. These spaces can be physical (e.g., work space, adaptive architectural designs), virtual (e.g., social networks, online communities), meetings (e.g., hackathons, design thinking sessions), or head space (e.g., dedicated free time for innovation). They are temporary and fluid, opening up under conditions of adaptive pressure to meet the needs of the situation and then dissipating as pressures reduce (cf. Lichtenstein, 2014).

Because ideas trigger at the intersection of networks (Burt, 2005), enabling leaders can open up adaptive space by brokering—bringing agents together in a group setting (e.g., a “colab,” Arena and Uhl-Bien, 2016), or linking up “poised” agents (i.e., agents with innovative approaches or seeking change) around an adaptive challenge. They can also open adaptive space by injecting tension into the system (e.g., Steve Jobs' pressures around beautiful and simple design) or using transparency to pressure a system to change (e.g., John Chambers' “You've got to disrupt or be disrupted”).

Enabling conflicting effectively requires that leaders “play in the pressures” (e.g., “cook the conflict,” Heifetz and Laurie, 2001; “hot stove effect,” Denrell and March, 2001) to make sure the tension is adaptive rather than disengaging. This is a delicate balance. Tension that gets too heated can overwhelm a system and create divides that work against amplification (i.e., linking up around an adaptive solution); tension that is too low does not motivate sufficient energy to be truly adaptive (i.e., response is status quo, and system stays in equilibrium).

For it to work, there must be climates of trust and support (Birkinshaw and Gibson, 2004). Agents need to feel safe engaging the conflicting process (e.g., psychological safety, Edmondson, 1999) and leaders need to feel comfortable in taking risks. Leaders also need to make sure that agents keep going under conflicting. Many times conflicting occurs naturally when individuals take ideas from one local system into another (e.g., cross departmental or functional lines), but

can easily get stifled when they run into what they perceive as a “brick wall.” Therefore, enabling leaders help sustain and protect adaptive space that keeps linkages open and agents energized and motivated (Arena et al., 2017).

Connecting

Connecting involves linking up agents (i.e., ideas, information, people, resources, technology) in ways that scale novelty and innovation into beneficial new order in the operational system. In many organizations, structural, behavioral, cognitive and political barriers work against amplification and emergence of novelty by stifling information flows and interconnectivity (Zahra and George, 2002). Connecting overcomes this problem by using networks to enable the rich interconnectivity (i.e., complexity) needed for a system to be adaptive (Uhl-Bien and Arena, 2017; Zahra and George, 2002).

Leaders enable connecting by creating adaptive space that uses network structures to energize and amplify the emergence of novelty and innovation (Arena et al., 2017). Networks help in this process. Brokering helps create linkages that trigger novelty; cohesion helps create strong relational ties that allow people to process and refine ideas in safe environments; bridging aggregates agents across disperse groups to energize a movement and build momentum for change; network closure around a sponsor helps ideas scale into the operational system; brokering at the “edge” (e.g., boundaries of networks) can be used to enhance knowledge transfer and knowledge spillovers (Burt, 1992, 2004, 2005; Perry-Smith and Mannucci, 2017).

Connecting is also essential relative to the conflicting process: Conflicting without connecting is not productive and can be destructive. Enabling leaders help agents (i.e., ideas, people, information, technology, resources) connect across differences and link up around adaptive responses (Arena et al., 2017). They work to bridge differences and broker connections that bring people together. This is important throughout the adaptive process, but becomes particularly relevant in tipping new ideas into the operational system (Uhl-Bien and Arena, 2017). Enabling leaders allow adaptive ideas to find and link up with sponsors who align the operational system to accommodate the new approach (Arena et al., 2017).

Research implications

The leadership for organizational adaptability framework is a “meta theory” for concepts being addressed across a variety of literatures and disciplines. It brings together perspectives from strategy, OT, entrepreneurship, innovation, networks and complexity, and integrates them into a process (Langley, Smallman, Tsoukas, and Van De Ven, 2013) model that shows how leaders enable the adaptive process to position organizations for adaptability. This adaptive process is *meso* (House, Rousseau, and Thomas-Hunt, 1995), meaning that it crosses multiple organizational and individual levels, which is different from multi-level approaches that are often operationalized using a one-level difference (e.g., individual to group, Bliese, Halverson, and Schriesheim, 2002). Following the lead of strategy and OT researchers, studying it requires a broad range of methods (e.g., quantitative, qualitative, social network analysis, process approaches, inductive, deductive). For example, the now mainstream OT and strategy literatures on ambidexterity and dynamic capabilities have been built largely based on rich, in-depth qualitative case studies. These rigorous case studies (Eisenhardt, 1991; Eisenhardt and Graebner, 2007) were then later combined with quantitative (e.g., statistical analyses, social network analysis) studies, in an iterative approach that uses deductive studies to investigate propositions generated from inductive (i.e., case) studies.

Recognizing that organizational dynamics are better captured through processes than variables, process research has advanced significantly in recent years (Langley et al., 2013). Scholars in other fields are now regularly using qualitative and process approaches and are

offering findings that, because they are based on in-depth studies of practice, have strong rigor *and* relevance (Gulati, 2007). Leadership research is particularly poised for this kind of undertaking. Like structural contingency models of OT (Lawrence and Lorsch, 1967), we have long known that leadership requires contingency theorizing (Fiedler, 1971). Contingency approaches recognize that we cannot describe exactly what leaders do because it will always vary depending on the situation. This led to a vast body of work investigating leader (i.e., manager) characteristics and behaviors (Yukl, 2012). These models explain only the *interpersonal* aspects of leadership, however. Issues of structure, process and organizational dynamics have traditionally been the domain OT and strategy researchers. The problem is that these researchers are not geared to focus on leadership, so the crucial role that leadership plays in these processes get lost, or worse, denigrated (Pfeffer, 2015). Leadership research is desperately needed that can inform leadership education and development programs regarding how to train people in the skills, abilities and knowledge they need to lead in adaptive organizations.

Adopting process approaches requires us to think differently about issues of measurement and generalizability in leadership research. It can feel overwhelming to leadership researchers who are trained in precision of measurement and hypothesis testing through variables. While some aspects of leadership for organizational adaptability will certainly lend themselves to measurement, not all aspects of organizational adaptability research are amenable to operationalization through variables. Instead they will require a focus on process. What we need to remember as we consider process is that, in true contingency fashion, the ways in which leaders engage with and enable the adaptive process will always vary, but the overarching process will remain the same (Fig. 5). Therefore we need to study the many and varied ways leaders enable (or stifle) the adaptive process in organizations.

The study of leadership for organizational adaptability can thus be represented by a process framework describing the function and role of entrepreneurial, enabling, and operational leadership. It is, quite simply, the study of how leaders enable the adaptive process in organizations. Future research can investigate these forms of leadership and their roles in enabling (or stifling) the adaptive process. Leadership research also needs to consider outcomes (e.g., dependent variables) associated with organizational adaptability, and not just productivity or performance.

On that note, one of the biggest implications of the findings from our review is a *critical need for leadership researchers to add a focus on organizational adaptability as a dependent variable*. Now that we see the adaptive process and how it works, we are struck with the realization that leadership research has been heavily biased toward performance—which may actually be harming adaptability. Clearly the two are related: Performance is needed for adaptability, and adaptability can lead to performance. *But we cannot assume that one gets us the other*. Therefore, we need to broaden our focus in leadership to include outcomes and dependent variables that recognize the need for, and importance of, organizational adaptability.

Practice implications

Our review identifies important implications for practice. First, leadership for organizational adaptability looks different from what we typically associate with strong leadership. Leaders who engage in it use behaviors such as brokering, connecting, facilitating, and energizing to trigger and amplify emergence of creativity, innovation, learning and growth. It is often much less hands-on and much more behind the scenes than traditional leadership. It also more distributed, involving sharing credit and working collaboratively, rather than hierarchically. Therefore, it can, and often does, go unrecognized in organizational systems that focus on strong, hierarchical forms of leadership. Organizations that are pursuing adaptability (and most organization today need to be) must thus take a careful look at their compensation

and reward systems to see what kinds of leadership behaviors they are rewarding, and whether these behaviors and incentives will get the organization the adaptability it needs.

Second, as in leadership research, many organizations are focused primarily on performance outcomes. While these outcomes are obviously important and cannot be overlooked, they are only one aspect of the adaptability equation. Moreover, research findings show that sometimes adaptability requires taking a hit on the numbers in the short term to enable sustainability in the long term. Therefore, adaptability as well as performance should be considered as an important component of leadership success.

Third, leadership development and education needs to identify and train leaders in skills that are needed to operate in our new organizational world. The 2015 *World Economic Forum Future of Jobs Report* identified the top skills needed in today's workplace as complex problem solving, critical thinking, creativity, people management and coordinating with others—all behaviors identified in our review as being associated with leadership for organizational adaptability. Yet these skills are not often the ones we typically focus on in leadership training. Leaders need help in getting skills and toolkits, and the earlier they can start this training (e.g., high school) the better. For young leaders, they need to know not only how to enact these skills, but how to do so in systems that will likely not be structured for adaptability. For more senior leaders, they need to know that times are changing, and that what got them and their organization to success is likely not what will keep them there. Senior leaders play a crucial part in determining whether and how leaders will be able to engage the adaptive process through their role in enabling or stifling the conditions needed for adaptive space.

Finally, leadership for organizational adaptability is not a “feel good” model of leadership. It involves tension, conflicting, creativity, uncertainty and, for many, stress. For those who like order it takes them out of their comfort zone—leadership for adaptability requires high tolerance for ambiguity. For those who like creativity, innovation and emergence (i.e., complexity) it requires stamina, as engaging in entrepreneurial and enabling leadership takes energy and tenacity. Therefore, organizations need to develop HR, coaching and talent management systems that can help people find their way through these processes to survive, and even thrive, in organizations focused on performance and adaptability.

Conclusion

The issue of enabling organizations for adaptability is arguably one of the greatest challenges facing leaders today, and many leaders are at a loss for how to do it. Those who are doing it do not have the language and frameworks to explain what they are doing, and because they are leading differently, they often are not fully understood or recognized by performance management systems that privilege productivity over adaptability. In the last two decades research in strategy and OT has rapidly advanced new understanding of organizational adaptability relative to structure, capabilities, networks, innovation and complexity. Because leadership researchers are not involved in this work, however, implications for leadership are not well understood. Leadership scholars are uniquely positioned to have a voice in this conversation. We know a lot about how to enable and empower people for productivity and performance. We need to now extend our understanding to enabling people, systems and structures for organizational adaptability. The complexity leadership model of leadership for organizational adaptability presented in Fig. 5 offers a way to do this. It provides a meta-framework for synthesizing across a wide range of literatures and perspectives to make sense of the disparate findings and provide a clearer picture of the role of leaders and leadership in enabling adaptability in organizations.

Acknowledgment

The authors would like to acknowledge Russ Marion for his pioneering work in complexity leadership that allowed us to develop the ideas and insights presented in this paper. We would also like to thank Craig Schreiber and Ivana Milosevic for their research contributions, and Dana Baugh, Brad Anderson and Debra France who helped us to understand and clarify how these processes work in practice.

References

- Aldrich, H. E. (1999). *Organizations evolving*. London: Sage.
- Allred, C. R., Fawcett, S. E., Wallin, C., & Magan, G. M. (2011). A dynamic collaboration capability as a source of competitive advantage. *Decision Sciences*, 42(1), 129–161. <http://dx.doi.org/10.1111/j.1540-5915.2010.00304.x>.
- Andriopoulos, C., & Lewis, M. W. (2010). Managing innovation paradoxes: Ambidexterity lessons from leading product design companies. *Long Range Planning*, 43(1), 104–122. <http://dx.doi.org/10.1016/j.lrp.2009.08.003>.
- Arena, M., Cross, R., Sims, J., & Uhl-Bien, M. (2017). Groundswell: Tapping the power of employee networks to fuel emergent innovation. *MIT Sloan Management Review*, 58(4), 39–47.
- Arena, M., & Uhl-Bien, M. (2016). Complexity leadership theory: Shifting from human capital to social capital. *People and Strategy*, 39(2), 22–27.
- Augier, M., & Teece, D. J. (2009). Dynamic capabilities and the role of managers in business strategy and economic performance. *Organization Science*, 20(2), 410–421.
- Balkundi, P., & Kilduff, M. (2006). The ties that lead: A social network approach to leadership. *The Leadership Quarterly*, 17(4), 419–439.
- Barnard, C. I. (1938). *The functions of the executive*. Cambridge, MA: Harvard University Press.
- Barney, J. (1991). Special theory forum: The resource-based model of the firm: Origins, implications, and prospects. *Journal of Management*, 17(1), 97.
- Baur, J. E., Parker Ellen, B., Buckley, M. R., Ferris, G. R., Allison, T. H., McKenny, A. F., & Short, J. C. (2016). More than oneway to articulate a vision: A configurations approach to leader charismatic rhetoric and influence. *The Leadership Quarterly*, 27(1), 156–171.
- Benner, M. J., & Tushman, M. L. (2003). Exploitation, exploration, and process management: The productivity dilemma revisited. *Academy of Management Review*, 28(2), 238–256. <http://dx.doi.org/10.5465/AMR.2003.9416096>.
- Birkinshaw, J., & Gibson, C. (2004). Building ambidexterity into an organization. *MIT Sloan Management Review*, 45(4), 47–55.
- Birkinshaw, J., & Lingblad, M. (2005). Intrafirm competition and charter evolution in the multibusiness firm. *Organization Science*, 16(6), 674–686. <http://dx.doi.org/10.1287/orsc.1050.0142>.
- Björk, J., Boccadelli, P., & Magnusson, M. (2010). Creativity and innovation management: Ideation capabilities for continuous innovation. *Creativity and Innovation Management*, 19(4), 385–396. <http://dx.doi.org/10.1111/j.1467-8691.2010.00581.x>.
- Bliese, P. D., Halverson, R. R., & Schriesheim, C. A. (2002). Benchmarking multilevel methods in leadership: The articles, the model, and the data set. *The Leadership Quarterly*, 13(1), 3–14.
- Boumgarden, P., Nickerson, J., & Zenger, T. R. (2012). Sailing into the wind: Exploring the relationships among ambidexterity, vacillation, and organizational performance. *Strategic Management Journal*, 33(6), 587–610. <http://dx.doi.org/10.1002/smj.1972>.
- Bridwell-Mitchell, E. N., & Lant, T. K. (2014). Be careful what you wish for: The effects of issue interpretation on social choice in professional networks. *Organization Science*, 25(2), 401–419. <http://dx.doi.org/10.1287/orsc.2013.0840>.
- Brown, S. L., & Eisenhardt, K. M. (1997). The art of continuous change: Linking complexity theory and time-paced evolution in relentlessly shifting organizations. *Administrative Science Quarterly*, 42(1), 1–34.
- Brown, S. L., & Eisenhardt, K. M. (1998). *Competing on the edge: Strategy as structured chaos*. Boston: Harvard Business School Press.
- Browning, L. D., Beyer, J. M., & Stetler, J. C. (1995). Building cooperation in a competitive industry: Sematech and the semiconductor industry. *Academy of Management Journal*, 38(1), 113–151.
- Burke, C. S., Pierce, L. G., & Salas, E. (2006). *Understanding adaptability: A prerequisite for effective performance within complex environments*. Amsterdam, Netherlands: Elsevier.
- Burns, T., & Stalker, G. M. (1961). *The management of innovation*. London: Tavistock.
- Burt, R. (2004). Structural holes and good ideas. *American Journal of Sociology*, 110(2), 349–399.
- Burt, R. (2005). Brokerage and closure: An introduction to social capital. *Administrative Science Quarterly*, 52(3), 482–485.
- Burt, R. S. (1992). *Structural holes: The social structure of competition*. Boston: Harvard University Press.
- Cantarello, S., Martini, A., & Nosella, A. (2012). A multi-level model for organizational ambidexterity in the search phase of the innovation process. *Creativity and Innovation Management*, 21(1), 28–48. <http://dx.doi.org/10.1111/j.1467-8691.2012.00624.x>.
- Capron, L., & Mitchell, W. (2009). Selection capability: How capability gaps and internal social frictions affect internal and external strategic renewal. *Organization Science*, 20(2), 294–312. <http://dx.doi.org/10.1287/orsc.1070.0328>.
- Carley, K., & Lee, J. S. (1998). Dynamic organizations: Organizational adaptation in a changing environment. *Advances in Strategic Management: A Research Annual*, 15, 269–297.
- Carmeli, A., Gelbard, R., & Gefen, D. (2010). The importance of innovation leadership in

- cultivating strategic fit and enhancing firm performance. *The Leadership Quarterly*, 21(3), 339–349.
- Carnabuci, G., & Diószegi, B. (2015). Social networks, cognitive style, and innovative performance: A contingency perspective. *Academy of Management Journal*, 58(3), 881–905. <http://dx.doi.org/10.5465/amj.2013.1042>.
- Cegarra-Navarro, J. G., & Dewhurst, F. (2007). Linking organizational learning and customer capital through an ambidexterity context: An empirical investigation in SMEs. *International Journal of Human Resource Management*, 18(10), 1720–1735. <http://dx.doi.org/10.1080/09585190701570882>.
- Cepeda, G., & Vera, D. (2007). Dynamic capabilities and operational capabilities: A knowledge management perspective. *Journal of Business Research*, 60(5), 426–437. <http://dx.doi.org/10.1016/j.jbusres.2007.01.013>.
- Chambers (2016). <http://www.mckinsey.com/industries/high-tech/our-insights/cisco-john-chambers-on-the-digital-era>.
- Chan, D. (2000). Understanding adaptation to changes in the work environment: Integrating individual difference and learning perspectives. *Research in Personnel and Human Resources Management*, 18, 1–42.
- Chen, Y., & Chang, C. (2013). The determinants of green product development performance: Green dynamic capabilities, green transformational leadership, and green creativity. *Journal of Business Ethics*, 116(1), 107–119.
- Child, J., & McGrath, R. G. (2001). Organizations unfettered: Organizational form in an information-intensive economy. *The Academy of Management Journal*, 44(6), 1135–1149.
- Chiles, T. H., Meyer, A. D., & Hench, T. J. (2004). Organizational emergence: The origin and transformation of Branson, Missouri's musical theaters. *Organization Science*, 15(5), 499–519.
- Christensen, C. M. (1997). *The innovator's dilemma: When new technologies cause great firms to fail*. Boston: Harvard Business School Press.
- Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*, 35(1), 128–152. <http://dx.doi.org/10.2307/2393553>.
- Damanpour, F., & Schneider, M. (2006). Phases of the adoption of innovation in organizations: Effects of environment, organization and top managers. *British Journal of Management*, 17(3), 215–236. <http://dx.doi.org/10.1111/j.1467-8551.2006.00498.x>.
- Davis, J. P., & Eisenhardt, K. M. (2011). Rotating leadership and collaborative innovation: Recombination processes in symbiotic relationships. *Administrative Science Quarterly*, 56(2), 159–201.
- Day, D. V., Fleenor, J. W., Atwater, L. E., Sturm, R. E., & McKee, R. A. (2014). Advances in leader and leadership development: A review of 25 years of research and theory. *The Leadership Quarterly*, 25(1), 63–82.
- Denison, D. R., Hooijberg, R., & Quinn, R. E. (1995). Paradox and performance: Toward a theory of behavioral complexity in managerial leadership. *Organization Science*, 6(5), 524–540.
- Denrell, J., & March, J. G. (2001). Adaptation as information restriction: The hot stove effect. *Organization Science*, 12(5), 523–538.
- DeRue, D. S., Ashford, S. J., & Myers, C. G. (2012). Learning agility: Many questions, a few answers, and a path forward. *Industrial and Organizational Psychology: Perspectives on Science and Practice*, 5(3), 316–322.
- Dixon, S., Meyer, K., & Day, M. (2014). Building dynamic capabilities of adaptation and innovation: A study of micro-foundations in a transition economy. *Long Range Planning*, 47(4), 186–205. <http://dx.doi.org/10.1016/j.lrp.2013.08.011>.
- Doz, Y. L., & Kosonen, M. (2010). Embedding strategic agility: A leadership agenda for accelerating business model renewal. *Long Range Planning: International Journal of Strategic Management*, 43(2–3), 370–382.
- Duncan, R. (1976). The ambidextrous organization: Designing dual structures for innovation. In R. H. Killman, L. R. Pondy, & D. Slevin (Eds.), *The management of organization* (pp. 167–188). New York: North Holland.
- Durkin, B., & Todorova, G. (2012). A study of the performativity of the 'ambidextrous organizations' theory: Neither lost in nor lost before translation. *Journal of Product Innovation Management*, 29(5)–2975. <http://dx.doi.org/10.1111/j.1540-5885.2012.00981.x>.
- Edmondson, A. (1999). Psychological safety and learning behavior in work teams. *Administrative Science Quarterly*, 44(2), 350–383.
- Eisenhardt, K. M. (1991). Better stories and better constructs: The case for rigor and comparative logic. *Academy of Management Review*, 16(3), 620.
- Eisenhardt, K. M., & Graebner, M. E. (2007). Theory building from cases: Opportunities and challenges. *Academy of Management Journal*, 50(1), 25–32. <http://dx.doi.org/10.5465/AMJ.2007.24160888>.
- Eisenhardt, K. M., & Martin, J. A. (2000). Dynamic capabilities: What are they? *Strategic Management Journal*, 21/10–11(October/November 2000), 1105–1121.
- Eisenhardt, K. M., & Schoonhoven, C. B. (1990). Organizational growth: Linking founding team, strategy, environment, and growth among U.S. semiconductor ventures, 1978–1988. *Administrative Science Quarterly*, 35(3), 504–529.
- Eisenhardt, K. M., & Tabrizi, B. N. (1995). Accelerating adaptive processes: Product innovation in the global computer industry. *Administrative Science Quarterly*, 40(1), 84–110.
- Fairhurst, G. T., Smith, W. K., Banghart, S. G., Lewis, M. W., Putnam, L. L., Raisch, S., & Schad, J. (2016). Diverging and converging: Integrative insights on a paradox meta-perspective. *Academy of Management Annals*, 10(1), 173–182. <http://dx.doi.org/10.1080/19416520.2016.1162423>.
- Fiedler, F. (1971). Validation and extension of the contingency model of leadership effectiveness: A review of empirical findings. *Psychological Bulletin*, 76, 128–148.
- Fleming, L., Mingo, S., & Chen, D. (2007). Collaborative brokerage, generative creativity, and creative success. *Administrative Science Quarterly*, 52(Sep.), 443–475.
- Floyd, S. W., & Lane, P. J. (2000). Strategizing throughout the organization: Managing role conflict in strategic renewal. *The Academy of Management Review*, 25(1), 154–177. <http://dx.doi.org/10.2307/259268>.
- Foldy, E., Goldman, L., & Ospina, S. (2008). Sensegiving and the role of cognitive shifts in the work of leadership. *The Leadership Quarterly*, 19, 514–529.
- Fonseca, J. (2002). *Complexity and innovation in organizations*. London: Routledge.
- Galbraith, J. (1973). *Designing complex organizations*. Reading, MA: Addison-Wesley.
- Galunic, D. C., & Eisenhardt, K. M. (2001). Architectural innovation and modular corporate forms. *Academy of Management Journal*, 44(6), 1229–1249. <http://dx.doi.org/10.2307/3069398>.
- Gibson, C. B., & Birkinshaw, J. (2004). The antecedents, consequences, and mediating role of organizational ambidexterity. *Academy of Management Journal*, 47(2), 209–226. <http://dx.doi.org/10.2307/20159573>.
- Gioia, D. A., & Thomas, J. B. (1996). Identity, image, and issue interpretation: Sensemaking during strategic change in academia. *Administrative Science Quarterly*, 41(3), 370–403.
- Goldstein, J. (2007). A new model of emergence and its leadership implications. In J. Hazy, J. Goldstein, & B. Lichtenstein (Eds.), *Complex systems leadership theory*. Mansfield, MA: ISCE Publishing.
- Graetz, F., & Smith, A. C. (2008). The role of dualities in arbitrating continuity and change in forms of organizing. *International Journal of Management Reviews*, 10(3), 265–280. <http://dx.doi.org/10.1111/j.1468-2370.2007.00222.x>.
- Granovetter, M. (1985). Economic action and social structure: The problem of embeddedness. *American Journal of Sociology*, 91(3), 481–510. <http://dx.doi.org/10.1086/228311>.
- Granovetter, M. S. (1973). The strength of weak ties. *American Journal of Sociology*, 78(6), 1360–1380.
- Griffith, J., Connelly, S., Thiel, C., & Johnson, G. (2015). How outstanding leaders lead with affect: An examination of charismatic, ideological, and pragmatic leaders. *The Leadership Quarterly*, 26(4), 502–517.
- Gulati, R. (2007). Tent poles, tribalism and boundary spanning: The rigor-relevance debate in management research. *Academy of Management Journal*, 50(4), 775–782. <http://dx.doi.org/10.5465/AMJ.2007.26279170>.
- Gulati, R., & Puranam, P. (2009). Renewal through reorganization: The value of inconsistencies between formal and informal organization. *Organization Science*, 20(2), 422–440. <http://dx.doi.org/10.1287/orsc.1090.0421>.
- Havermans, L. A., Den Hartog, D. N., Keegan, A., & Uhl-Bien, M. (2015). Exploring the role of leadership in enabling contextual ambidexterity. *Human Resource Management*, 54(Suppl. 1), s179–s200.
- Hayek, F. A. (1988). *The fatal conceit*. London, U.K.: Routledge.
- He, Z., & Wong, P. (2004). Exploration vs. exploitation: An empirical test of the ambidexterity hypothesis. *Organization Science*, 15(4), 481–494. <http://dx.doi.org/10.1287/orsc.1040.0078>.
- Heifetz, R. A., & Laurie, D. L. (2001). The work of leadership. *Harvard Business Review*, 79(11), 131–141.
- Helfat, C. E., Finkelstein, S., Mitchell, W., Peteraf, M. A., Singh, H., Teece, D. J., & Winter, S. G. (2007). *Dynamic capabilities: Understanding strategic change in organizations*. Malden: Blackwell Publishing.
- Helfat, C. E., & Peteraf, M. A. (2003). The dynamic resource-based view: Capability lifecycles. *Strategic Management Journal*, 24(10), 997–1010.
- Holland, J. H. (1995). *Hidden order: How adaptation builds complexity*. New York: Helix Books.
- Holland, J. H. (1998). *Emergence: From chaos to order*. Oxford: Oxford University Press.
- Hollenbeck, J. R., & Jamieson, B. B. (2015). Human capital, social capital, and social network analysis: Implications for strategic human resource management. *Academy of Management Perspectives*, 29(3), 370–385.
- Hooijberg, R., Hunt, J. G., & Dodge, G. E. (1997). Leadership complexity and development of the Leaderplex Model. *Journal of Management*, 23(3), 375–408.
- Hotho, S., & Champion, K. (2010). "We are always after that balance" - Managing innovation in the new digital media industries. *Journal of Technology Management & Innovation*, 5(3), 36–50.
- House, R., Rousseau, D., & Thomas-Hunt, M. (1995). The meso paradigm: A framework for the integration of micro and macro organizational behavior. In L. L. Cummings, & B. M. Staw (Vol. Eds.), *Research in organizational behavior*. Vol. 17. *Research in organizational behavior* (pp. 71–114). Greenwich, CT: JAI Press.
- Howell, J. M., & Boies, K. (2004). Champions of technological innovation: The influence of contextual knowledge, role orientation, idea generation, and idea promotion on champion emergence. *The Leadership Quarterly*, 15(1), 123.
- Jansen, J. P., Simsek, Z., & Cao, Q. (2012). Ambidexterity and performance in multiunit contexts: Cross-level moderating effects of structural and resource attributes. *Strategic Management Journal*, 33(11), 1286–1303. <http://dx.doi.org/10.1002/smj.1977>.
- Jansen, J. P., Tempelaar, M. P., Van den Bosch, F. J., & Volberda, H. W. (2009). Structural differentiation and ambidexterity: The mediating role of integration mechanisms. *Organization Science*, 20(4), 797–811.
- Janssen, M., & van der Voort, H. (2016). Adaptive governance: Towards a stable, accountable and responsive government. *Government Information Quarterly*, 33(1), 1–5.
- Jehn, K. A. (1997). A qualitative analysis of conflict types and dimensions in organizational groups. *Administrative Science Quarterly*, 42(3), 530–557.
- Kan, M. M., & Parry, K. W. (2004). Identifying paradox: A grounded theory of leadership in overcoming resistance to change. *The Leadership Quarterly*, 15(4), 467–491. <http://dx.doi.org/10.1016/j.leaqua.2004.05.003>.
- Keister, A. C. (2014). Thriving teams and change agility: Leveraging a collective state to create organization agility. In A. Shani, & D. A. Noumair (Vol. Eds.), *Research in organizational change and development*. Vol. 22. *Research in organizational change and development* (pp. 299–333). Bingley, UK: Emerald.
- Kim, L. (1997). The dynamics of Samsung's technological learning in semiconductors. *California Management Review*, 39(3), 86–100.
- Kogut, B., & Zander, U. (1992). Knowledge of the firm, combinative capabilities, and the

- replication of technology. *Organization Science*, 3(3), 383–397. <http://dx.doi.org/10.1287/orsc.3.3.383>.
- Langley, A., Smallman, C., Tsoukas, H., & Van De Ven, A. H. (2013). Process studies of change in organization and management: Unveiling temporality, activity, and flow. *Academy of Management Journal*, 56(1), 1–13. <http://dx.doi.org/10.5465/amj.2013.4001>.
- Lawrence, P. R., & Lorsch, J. W. (1967). Differentiation and integration in complex organizations. *Administrative Science Quarterly*, 12, 1–47.
- Leonard-Barton, D. (1992). Core capabilities and core rigidities: A paradox in managing new product development. *Strategic Management Journal*, 13(11)–13(12), 1311–13125.
- Levinthal, D., & Rerup, C. (2006). Crossing an apparent chasm: Bridging mindful and less-mindful perspectives on organizational learning. *Organization Science*, 17(4), 502–513. <http://dx.doi.org/10.1287/orsc.1060.0197>.
- Levinthal, D. A., & March, J. G. (1993). The myopia of learning. *Strategic Management Journal*, 14, 95–112.
- Lewin, A. Y., & Volberda, H. W. (1999). Prolegomena on coevolution: A framework for research on strategy and new organizational forms. *Organization Science*, 10(5), 519–534.
- Lewis, M. W. (2000). Exploring paradox: Toward a more comprehensive guide. *The Academy of Management Review*, 25(4), 760–776. <http://dx.doi.org/10.2307/259204>.
- Li, M. (2013). Social network and social capital in leadership and management research: A review of causal methods. *The Leadership Quarterly*, 24(5), 638–665.
- Lichtenstein, B. (2000). Emergence as a process of self-organizing: New assumptions and insights from the study of nonlinear dynamic systems. *Journal of Organizational Change Management*, 13, 526–544.
- Lichtenstein, B. (2014). *Generative emergence: A new science of organizational, entrepreneurial and social creation*. New York: Oxford University Press.
- Lichtenstein, B. B., & Plowman, D. A. (2009). The leadership of emergence: A complex systems leadership theory of emergence at successive organizational levels. *The Leadership Quarterly*, 20(4), 617–630.
- Lubatkin, M. H., Simsek, Z., Ling, Y., & Veiga, J. F. (2006). Ambidexterity and performance in small- to medium-sized firms: The pivotal role of top management team behavioral integration. *Journal of Management*, 32(5), 646–672. <http://dx.doi.org/10.1177/0149206306290712>.
- Makri, M., & Scandura, T. A. (2010). Exploring the effects of creative CEO leadership on innovation in high-technology firms. *The Leadership Quarterly*, 21(1), 75–88.
- March, J. G. (1991). Exploration and exploitation in organizational learning. *Organization Science*, 2(1), 71–87. <http://dx.doi.org/10.1287/orsc.2.1.71>.
- Marcy, R. T. (2015). Breaking mental models as a form of creative destruction: The role of leader cognition in radical social innovations. *The Leadership Quarterly*, 26(3), 370–385.
- Margolis, J. A., & Ziegert, J. C. (2016). Vertical flow of collectivistic leadership: An examination of the cascade of visionary leadership across levels. *The Leadership Quarterly*, 27(2), 334–348.
- Marion, R., Christiansen, J., Klar, H. W., Schreiber, C., & Akif Erdener, M. (2016). Informal leadership, interaction, cliques and productive capacity in organizations: A collectivist analysis. *The Leadership Quarterly*, 27(2), 242–260.
- Marion, R., & Uhl-Bien, M. (2001). Leadership in complex organizations. *The Leadership Quarterly*, 12(4), 389–418.
- Marion, R., & Uhl-Bien, M. (2003). Complexity theory and Al-Qaeda: Examining complex leadership. *Emergence: A Journal of Complexity Issues in Organizations and Management*, 5, 56–78.
- Markides, C., & Charitou, C. D. (2004). Competing with dual business models: A contingency approach. *Academy of Management Executive*, 18(3), 22–36. <http://dx.doi.org/10.5465/AME.2004.14776164>.
- Martin, J. A. (2011). Dynamic managerial capabilities and the multibusiness team: The role of episodic teams in executive leadership groups. *Organization Science*, 22(1), 118–140.
- McGrath, J. E. (1984). *Groups: Interaction and performance*. Inglewood, N. J.: Prentice Hall, Inc.
- Mehra, A., Smith, B. R., Dixon, A. L., & Robertson, B. (2006). Distributed leadership in teams: The network of leadership perceptions and team performance. *The Leadership Quarterly*, 17(3), 232–245.
- Nahapiet, J., & Ghoshal, S. (1998). Social capital, intellectual capital and the organizational advantage. *Academy of Management Review*, 23(2), 242–266. <http://dx.doi.org/10.5465/AMR.1998.533225>.
- Newey, L. R., & Zahra, S. A. (2009). The evolving firm: How dynamic and operating capabilities interact to enable entrepreneurship. *British Journal of Management*, 20(S1)–S100. <http://dx.doi.org/10.1111/j.1467-8551.2008.00614.x>.
- Nickerson, J. A., & Zenger, T. R. (2002). Being efficiently fickle: A dynamic theory of organizational choice. *Organization Science*, 13(5), 547–566. <http://dx.doi.org/10.1287/orsc.13.5.547.7815>.
- Nonaka, I. (1994). A dynamic theory of organizational knowledge creation. *Organization Science*, 5(1), 14–37.
- Nonaka, I., & Toyama, R. (2003). The knowledge-creating theory revisited: Knowledge creation as a synthesizing process. *Knowledge Management Research and Practice*, 1, 2–10.
- O'Reilly, C. A., & Tushman, M. L. (2008). Ambidexterity as a dynamic capability: Resolving the innovator's dilemma. *Research in Organizational Behavior*, 28(1)–28(2), 2815–28206. <http://dx.doi.org/10.1016/j.riob.2008.06.002>.
- O'Reilly, C. A., III, & Tushman, M. L. (2004). The ambidextrous organization. *Harvard Business Review*, 82(4), 74–81.
- Osborn, R. N., & Marion, R. (2009). Contextual leadership, transformational leadership and the performance of international innovation seeking alliances. *The Leadership Quarterly*, 20(2), 191–206.
- Ospina, S., & Foldy, E. (2010). Building bridges from the margins: The work of leadership in social change organizations. *The Leadership Quarterly*, 21(2), 292–307.
- Papachroni, A., Heracleous, L., & Paroutis, S. (2016). In pursuit of ambidexterity: Managerial reactions to innovation–efficiency tensions. *Human Relations*, 69(9), 1791–1822.
- Parry, K. W. (1999). Enhancing adaptability: Leadership strategies to accommodate change in local government settings. *Journal of Organizational Change Management*, 12(2), 134–156.
- Peeters, C., Massini, S., & Lewin, A. Y. (2014). Sources of variation in the efficiency of adopting management innovation: The role of absorptive capacity routines, managerial attention and organizational legitimacy. *Organization Studies*, 35(9), 1343–1371. <http://dx.doi.org/10.1177/0170840614539311>.
- Penrose, E. T. (1959). *The theory of the growth of the firm*. New York: John Wiley.
- Pérez-Nordtvedt, L., O'Brien, R., & Rasheed, A. A. (2013). What are temporary networks and when are they useful? *Group & Organization Management*, 38(3), 392–421. <http://dx.doi.org/10.1177/1059601113485976>.
- Perry-Smith, J. E., & Mannucci, P. V. (2017). From creativity to innovation: The social network drivers of the four phases of the idea journey. *Academy of Management Review*, 42(1), 53–79. <http://dx.doi.org/10.5465/amr.2014.0462>.
- Peschl, M., & Fundneider, T. (2008). Emergent innovation and sustainable knowledge co-creation: A socio-epistemological approach to “innovation from within”. *Communications in Computer and Information Science*, 19, 101–108.
- Pfeffer, J. (2015). *Leadership BS: Fixing workplaces and careers one truth at a time*. New York: HarperCollins.
- Plowman, D. A., Baker, L. T., Beck, T. E., Kulkarni, M., Solansky, S. T., & Travis, D. V. (2007). Radical change accidentally: The emergence and amplification of small change. *Academy of Management Journal*, 50(3), 515–543.
- Plowman, D. A., Solansky, S., Beck, T. E., Baker, L., Kulkarni, M., & Travis, D. V. (2007). The role of leadership in emergent, self-organization. *The Leadership Quarterly*, 18(4), 341–356.
- Porter, C. H., Webb, J. W., & Gogus, C. I. (2010). When goal orientations collide: Effects of learning and performance orientation on team adaptability in response to workload imbalance. *Journal of Applied Psychology*, 95(5), 935–943.
- Randall, K. R., Resick, C. J., & DeChurch, L. A. (2011). Building team adaptive capacity: The roles of sensegiving and team composition. *Journal of Applied Psychology*, 96(3), 525–540.
- Reagans, R., & McEvily, B. (2003). Network structure and knowledge transfer: The effects of cohesion and range. *Administrative Science Quarterly*, 48(2), 240–267. <http://dx.doi.org/10.2307/3556658>.
- Reeves, M., & Deimler, M. (2011). Adaptability: The new competitive advantage. *Harvard Business Review*, 89/7–8(July/August 2011), 134–141.
- Rosenkopf, L., & McGrath, P. (2011). Advancing the conceptualization and operationalization of novelty in organizational research. *Organization Science*, 22(5), 1297–1311.
- Rosing, K., Frese, M., & Bausch, A. (2011). Explaining the heterogeneity of the leadership-innovation relationship: Ambidextrous leadership. *The Leadership Quarterly*, 22(5), 956–974.
- Salvato, C. (2009). Capabilities unveiled: The role of ordinary activities in the evolution of product development processes. *Organization Science*, 20(2), 384–409. <http://dx.doi.org/10.1287/orsc.1080.0408>.
- Schad, J., Lewis, M. W., Raisch, S., & Smith, W. K. (2016). Paradox research in management science: Looking back to move forward. *The Academy of Management Annals*, 10(1), 5–64.
- Schneider, M., & Somers, M. (2006). Organizations as complex adaptive systems: Implications of complexity theory for leadership research. *The Leadership Quarterly*, 17(4), 351–365.
- Schreyögg, G., & Kiesch-Eberl, M. (2007). How dynamic can organizational capabilities be? Towards a dual-process model of capability dynamization. *Strategic Management Journal*, 28(9), 913–933. <http://dx.doi.org/10.1002/smj.613>.
- Schumpeter, J. (1949). Economic theory and entrepreneurial history. *Prepared by the Harvard University Research Center in Entrepreneurial History Change and the Entrepreneur* (pp. 63–84). Boston: Harvard University Press.
- Seibert, S. E., Kraimer, M. L., & Liden, R. C. (2001). A social capital theory of career success. *Academy of Management Journal*, 44(2), 219–237. <http://dx.doi.org/10.2307/3069452>.
- Selznick, P. (1957). *Leadership in administration*. New York: Harper and Row.
- Sidhu, J. S., Commandeur, H. R., & Volberda, H. W. (2007). The multifaceted nature of exploration and exploitation: Value of supply, demand, and spatial search for innovation. *Organization Science*, 18(1), 20–38. <http://dx.doi.org/10.1287/orsc.1060.0212>.
- Siggelkow, N., & Levinthal, D. A. (2003). Temporarily divide to conquer: Centralized, decentralized, and reintegrated organizational approaches to exploration and adaptation. *Organization Science*, 14(6), 650–669. <http://dx.doi.org/10.1287/orsc.14.6.650.24870>.
- Simon, H. (1947). *Administrative behavior*. New York: Macmillan.
- Smith, W. K. (2014). Dynamic decision making: A model of senior leaders managing strategic paradoxes. *Academy of Management Journal*, 57(6), 1592–1623.
- Smith, W. K., & Tushman, M. L. (2005). Managing strategic contradictions: A top management model for managing innovation streams. *Organization Science*, 16(5), 522–536. <http://dx.doi.org/10.1287/orsc.1050.0134>.
- Soda, G., & Zaheer, A. (2012). A network perspective on organizational architecture: Performance effects of the interplay of formal and informal organization. *Strategic Management Journal*, 33(6), 751–771. <http://dx.doi.org/10.1002/smj.1966>.
- Stacey, R. D. (1995). The science of complexity: An alternative perspective for strategic change processes. *Strategic Management Journal*, 16(6), 477–495.
- Subramaniam, M., & Youndt, M. A. (2005). The influence of intellectual capital on the types of innovative capabilities. *Academy of Management Journal*, 48(3), 450–463.

- <http://dx.doi.org/10.5465/AMJ.2005.17407911>.
- Taylor, A., & Helfat, C. E. (2009). Organizational linkages for surviving technological change: Complementary assets, middle management, and ambidexterity. *Organization Science*, 20(4), 718–739. <http://dx.doi.org/10.1287/orsc.1090.0429>.
- Teece, D. J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal*, 28(13), 1319–1350. <http://dx.doi.org/10.1002/smj.640>.
- Teece, D. J. (2016). Dynamic capabilities and entrepreneurial management in large organizations: Toward a theory of the (entrepreneurial) firm. *European Economic Review*, 86, 202–216.
- Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7), 509–533.
- Thietart, R. A., & Forgues, B. (1995). Chaos theory and organization. *Organization Science*, 6, 19–31.
- Thompson, J. D. (1967). *Organizations in action: Social science bases of administrative theory*. New York: McGraw-Hill.
- Tortoriello, M., Reagans, R., & McEvily, B. (2012). Bridging the knowledge gap: The influence of strong ties, network cohesion, and network range on the transfer of knowledge between organizational units. *Organization Science*, 23(4), 1024–1039. <http://dx.doi.org/10.1287/orsc.1110.0688>.
- Tsai, W. (2001). Knowledge transfer in intraorganizational networks: Effects of network position and absorptive capacity on business unit innovation and performance. *Academy of Management Journal*, 44(5), 996–1004. <http://dx.doi.org/10.2307/3069443>.
- Tsai, W. (2002). Social structure of ‘coopetition’ within a multiunit organization: Coordination, competition, and intraorganizational knowledge sharing. *Organization Science*, 13(2), 179–190. <http://dx.doi.org/10.1287/orsc.13.2.179.536>.
- Tsoukas, H., & Chia, R. (2002). An organizational becoming: Rethinking organizational change. *Organization Science*, 13(5), 567–582. <http://dx.doi.org/10.1287/orsc.13.5.567.7810>.
- Turner, N., Swart, J., & Maylor, H. (2013). Mechanisms for managing ambidexterity: A review and research agenda. *International Journal of Management Reviews*, 15(3), 317–332.
- Tushman, M. L., & O’Reilly, C. A., III (1996). Ambidextrous organizations: Managing evolutionary and revolutionary change. *California Management Review*, 38(4), 8–30.
- Uhl-Bien, M., & Arena, M. (2017). Complexity leadership: Enabling people and organizations for adaptability. *Organizational Dynamics*, 46(1), 9–20.
- Uhl-Bien, M., & Marion, R. (2009). Complexity leadership in bureaucratic forms of organizing: A meso model. *The Leadership Quarterly*, 20(4), 631–650.
- Uhl-Bien, M., Marion, R., & McKelvey, B. (2007). Complexity leadership theory: Shifting leadership from the industrial age to the knowledge era. *The Leadership Quarterly*, 18(4), 298–318.
- Uzzi, B. (1997). Social structure and competition in interfirm networks: The paradox of embeddedness. *Administrative Science Quarterly*, 42, 35–67.
- Uzzi, B., & Spiro, J. (2005). Collaboration and creativity: The small world problem. *American Journal of Sociology*, 111(2), 447–504. <http://dx.doi.org/10.1086/432782>.
- Volberda, H. W., Foss, N. J., & Lyles, M. A. (2010). Absorbing the concept of absorptive capacity: How to realize its potential in the organization field. *Organization Science*, 21(4), 931–951. <http://dx.doi.org/10.1287/orsc.1090.0503>.
- Volberda, H. W., & Lewin, A. Y. (2003). Co-evolutionary dynamics within and between firms: From evolution to co-evolution. *Journal of Management Studies*, 40(8), 2111–2136. <http://dx.doi.org/10.1046/j.1467-6486.2003.00414.x>.
- Volberda, H. W., Van den Bosch, F. J., & Mihalache, O. R. (2014). Advancing management innovation: Synthesizing processes, levels of analysis, and change agents. *Organization Studies*, 35(9), 1245–1264. <http://dx.doi.org/10.1177/0170840614546155>.
- Walsh, J. P., & Ungson, G. R. (1991). Organizational memory. *The Academy of Management Review*, 16(1), 57–91. <http://dx.doi.org/10.2307/258607>.
- Weick, K. E., & Sutcliffe, K. M. (2006). Mindfulness and the quality of organizational attention. *Organization Science*, 17(4), 514–524. <http://dx.doi.org/10.1287/orsc.1060.0196>.
- Westerman, G., McFarlan, F. W., & Iansiti, M. (2006). Organization design and effectiveness over the innovation life cycle. *Organization Science*, 17(2), 230–238. <http://dx.doi.org/10.1287/orsc.1050.0170>.
- White, L., Currie, G., & Lockett, A. (2014). The enactment of plural leadership in a health and social care network: The influence of institutional context. *The Leadership Quarterly*, 25(4), 730–745.
- White, L., Currie, G., & Lockett, A. (2016). Pluralized leadership in complex organizations: Exploring the cross network effects between formal and informal leadership relations. *The Leadership Quarterly*, 27(2), 280–297.
- Winby, S., & Worley, C. G. (2014). Management processes for agility, speed, and innovation. *Organizational Dynamics*, 43(3), 225–234.
- Winter, S. G. (2003). Understanding dynamic capabilities. *Strategic Management Journal*, 24(10), 991–995.
- Woodman, R. W., Sawyer, J. E., & Griffin, R. W. (1993). Toward a theory of organizational creativity. *The Academy of Management Review*, 18(2), 293–321. <http://dx.doi.org/10.2307/258761>.
- Worley, C. G., & Lawler, E. I. (2010). Agility and organization design: A diagnostic framework. *Organizational Dynamics*, 39(2), 194–204.
- Yukl, G. (2012). *Leadership in organizations* (8th ed.). New York: Prentice Hall.
- Zaccaro, S. J., & Banks, D. (2004). Leader visioning and adaptability: Bridging the gap between research and practice on developing the ability to manage change. *Human Resource Management*, 43(4), 367–380.
- Zacher, H., Robinson, A. J., & Rosing, K. (2016). Ambidextrous leadership and employees’ self-reported innovative performance: The role of exploration and exploitation behaviors. *Journal of Creative Behaviour*, 50(1), 24–46.
- Zacher, H., & Rosing, K. (2015). Ambidextrous leadership and team innovation. *Leadership and Organization Development Journal*, 36(1), 54–68.
- Zahra, S. A., & George, G. (2002). Absorptive capacity: A review, reconceptualization, and extension. *Academy of Management Review*, 27(2), 185–203. <http://dx.doi.org/10.5465/AMR.2002.6587995>.
- Zollo, M., & Winter, S. G. (2002). Deliberate learning and the evolution of dynamic capabilities. *Organization Science*, 13(3), 339–351. <http://dx.doi.org/10.1287/orsc.13.3.339.2780>.