A STRATEGIC VIEW OF TEAM LEARNING IN ORGANIZATIONS

Jean-François Harvey*
Associate Professor
HEC Montréal
jfharvey@hec.ca

Henrik Bresman
Associate Professor
INSEAD
henrik.bresman@insead.edu

Amy C. Edmondson
Novartis Professor of Leadership and Management
Harvard Business School
aedmondson@hbs.edu

Gary P. Pisano
Harry E. Figgie Professor of Business Administration
Harvard Business School
gpisano@hbs.edu

*Corresponding author

Acknowledgements
This work was supported by the Division of Research at Harvard Business School; the R&D Committee at INSEAD; the Social Sciences and Humanities Research Council of Canada [430-2017-00527]; and the Fonds de Recherche du Québec-Société et Culture [2019-NP-252530]. We also gratefully acknowledge the help of research assistants Camila Bahn, Audrey Bélanger, Gabrielle Lamont-Dobbin, Paige Tsai, and Emily Veloza. We thank several colleagues for their insightful comments and feedback in preparing this manuscript, including Linda Argote, Stuart Bunderson, Henry Chesbrough, Johnathan Cromwell, Constance Helfat, Ann Langley, Suzanne Rivard, and David Teece.

A STRATEGIC VIEW OF TEAM LEARNING IN ORGANIZATIONS

Abstract

Research in strategic management and organizational behavior has increasingly focused on understanding how organizations achieve and sustain performance in fast-changing environments. Strategy research suggests that senior managers, through their decisions, influence capabilities at the organizational level. Organizational behavior research suggests that teams, through engaging in learning within and across their boundaries, contribute to organizational-level capabilities. Only recently have researchers started to link the two sets of insights, exploring the idea that team learning plays a critical bridging role in how decisions by senior managers translate into organizational performance outcomes. This paper organizes these insights into a model of capability development focused on how different kinds of team learning routines may support organizational capabilities that create competitive advantage. The model introduces a strategic view of team learning, highlighting the ability of senior managers to shape team learning routines effectively as a critical skill because of its role in building organizational capabilities. We identify a lack of research in this area and suggest future directions to address it.

Keywords. team learning, dynamic capabilities, managerial capabilities, organizational design

INTRODUCTION

There is broad and enduring interest in understanding how firms operating in dynamic environments adapt and change their strategies to sustain superior performance (e.g., Brown & Eisenhardt, 1997; Helfat et al., 2009; Luciano, Nahrgang, & Shropshire, 2020; Tushman & Anderson, 1986). One particularly influential body of work in the strategic management literature focuses on the evolution of a firm's organizational capabilities in a dynamic environment (Nelson & Winter, 1982), along with the ability to adapt these capabilities for strategic change reliably, so-called dynamic capabilities (Eisenhardt & Martin, 2000; Teece, 2007; Teece, Pisano, & Shuen, 1997). More recently, a research stream on the microfoundations of organizational capabilities has emerged (Helfat & Martin, 2015; Helfat & Peteraf, 2015; Kor & Mesko, 2013; Schilke, Hu, & Helfat, 2018), driven by an interest in the role of managerial decisions.

Despite the clear evidence of significant organizational-level effects associated with managerial decisions (Adner & Helfat, 2003), our understanding of how these decisions foster critical organizational-level capabilities remains limited. Scholars have suggested that to understand the microfoundations of organizational capabilities, we need to turn to the organizational behavior literature and research on teams[1] and, in particular, on team learning (Argote & Levine, 2020; Argote & Ren, 2012). Initial insights suggest that intra- and interteam learning behaviors play a central bridging role between the decisions of senior managers and the development of organizational capabilities, particularly in fast-moving contexts (Edmondson, 2002). While this link is intriguing, the research on organizational capabilities and team learning has remained essentially on parallel paths that rarely cross.

[1] Following Kozlowski and Ilgen, "teams are (a) two or more individuals who; (b) socially interact; (c) possess one or more common goals; (d) are brought together to perform organizationally relevant tasks; (e) exhibit interdependencies with respect to workflow, goals, and outcomes; (f) have different roles and responsibilities; and (g) are together embedded in an encompassing organizational system, with boundaries and linkages to the broader system context and task environment" (2006: 79).

This article seeks to merge insights from the two strands of literature by introducing team learning as a critical link between managerial decisions and strategic outcomes. In doing so, we offer a detailed review of team learning research, a multilevel model (including the relationships between managerial decisions, team learning routines, and organizational capabilities), and a roadmap for further research on how senior managers can help hone team learning routines for competitive advantage.

BACKGROUND

In this section we first provide an overview of important intellectual history and definitions. We then introduce a baseline model before proceeding to outline our review plan aimed at developing a more complex, multilevel model.

Intellectual History and Definitions

Organizational capabilities: dynamic and operational. The dynamic capabilities framework emerged from work in strategy that emphasized the critical role of an organization's distinct resources as a source of competitive advantage (e.g., Penrose, 1959, Wernerfelt, 1984). In the late 1990s, Teece and his colleagues focused their theorizing on how organizations could renew this resource base and defined dynamic capabilities as an organization's "ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments," and suggested that they "reflect an organization's ability to achieve new and innovative forms of competitive advantage" (Teece et al., 1997: 516). According to the dynamic capabilities framework, there are two broad categories of organizational capabilities: dynamic and operational. The latter category is directed toward leveraging existing activities (Martin, 2011; Schilke et al., 2018). Both categories of organizational capabilities are instrumental in achieving and sustaining competitive advantage.

Researchers then began to consider the role of individual managers in dynamic capabilities. Specifically, Adner and Helfat (2003) showed that even in instances when managers face the same external context and operate within the same industry, organizational-level effects associated with managerial decisions are statistically significant. They introduced the concept of dynamic managerial capabilities and defined it as the capabilities with which managers create, extend, and modify the ways in which organizations make a living, thereby introducing an important subcategory in line with the general dynamic capabilities framework with a unique focus on *managerial impact* on strategic change (Helfat & Martin, 2015; Schilke et al., 2018).

However, while the importance of dynamic managerial capabilities for effective strategic change in fast-changing contexts is now widely recognized, we are still limited in our understanding of how they are enacted. Researchers have taken up the question of what constitutes dynamic managerial capabilities at the individual level. Some have argued that managerial cognition is a fundamental psychological underpinning of dynamic managerial capabilities (Helfat & Peteraf, 2015). Others note that managers' emotions are a key psychological mechanism influencing the long-term adaptability of the organization (Hodgkinson & Healy, 2011). Yet we know less about how individual-level dynamic managerial capabilities translate to organizational-level outcomes. Most commonly, effects are explicitly or implicitly assumed to be isomorphic across levels of analysis (e.g., Hodgkinson and Healy, 2011; Kor & Mesko, 2013). However, by making a leap from individual traits and actions to organizational outcomes while mentioning the group level only in passing (Helfat & Peteraf, 2015), we miss incorporating essential insights from the literature about how organizations work.

It is often said that "the sum is greater than the parts." In our context, understanding the activities and properties of a team, or a collection of teams, takes more than just adding

them up based on the individual members. Importantly, organizations largely adapt through learning activities between individuals situated in teams and between teams situated in a larger organizational context (Argote, 1999; Edmondson, 2002). As these teams change how they do their work and coordinate with each other, based on their learning, an organization adapts to a dynamic environment to ensure long-term performance. Without a better understanding of how these intra- and inter-team learning activities unfold, we miss an essential link in understanding how organizational capabilities are enacted, especially in firms operating in fast-changing environments (Argote & Ren, 2012; Bingham, Heimeriks, Schijven, & Gates, 2015; Brown & Eisenhardt, 1997).

Team learning and organizational capabilities. The idea that team learning plays a key role in determining organizational outcomes can be traced back to early work on learning curves in groups (e.g., Leavitt, 1952) and organizations (e.g., Wright, 1936), which showed that performance improved with experience. Later work suggested a strong link between learning curves at the group and organizational levels by demonstrating that one shift in a plant, performed by one team of workers, can learn from another shift (Epple, Argote & Murphy, 1996). In a study of pizza stores, Darr and his colleagues (Darr, Argote & Epple, 1995) found that the unit cost of production declined significantly at individual pizza stores as stores owned by the same franchisee gained experience in production as a collective. Similarly, Ingram and Simons (2002) found that the profitability of a kibbutz agricultural group improved as a function of the experience accumulated in other groups within the collective of kibbutzim to which they belonged.

Finding significant learning effects across teams and groups begs the question of what learning activities teams engage in to achieve this positive outcome. In a multimethod study of work teams in a manufacturing company, Edmondson (1999) provided an important piece of the answer by systematically measuring a team learning routine, specific behaviors

through which a team obtains and processes knowledge that allows it to improve, such as seeking feedback and asking questions or acquiring information and reflecting on it. Related research showed that a critical outcome of such learning activities is new knowledge embedded in a supra-individual repository known as the team's transactive memory system, a shared system that team members develop to collectively encode, store, and retrieve knowledge (Argote & Ren, 2012; Wegner, 1987). Often referred to as simply 'who knows what,' transactive memory has been linked to performance in various settings (e.g., Lewis, 2004; Liang, Moreland & Argote, 1995).

Edmondson (2002) explored the role of team learning in organizational learning in subsequent qualitative work, suggesting that organizational learning is local, interpersonal, varied, and mostly taking place in teams. In a study of pharmaceutical drug development, Bresman (2010) highlighted vicarious learning behaviors as one specific mechanism by which learning can spread from one team to the larger organization. However, our understanding of how team learning activities "scale up" to the organization based on managerial decisions is fragmented and limited (Argote & Levin, 2020). An important purpose of this review is to help lessen the fragmentation and point toward a fuller understanding.

The concept of team learning is an 'umbrella' term for many related concepts and is likely to remain so (Argote, 1999). To ensure that we advance our understanding, researchers need to be precise about definitions and approaches (Edmondson, Dillon & Rolloff, 2007). For this article, we refer to the processes related to team learning as team learning routines. In the literature on organizational capabilities, patterned behaviors are referred to as routines (e.g., Cohen et al., 1996). While historically, routines were seen as means for transferring knowledge across individuals, teams, and organizations (Nelson & Winter, 1982), routines have since been recast as dynamic processes (Feldman, 2000; Zahra, Neubaum & Hayton,

2020), which is how we understand the concept. We thus rely on the term team learning routines to uphold conceptual symmetry with the discourse on organizational capabilities. However, we use it interchangeably with other common terms such as team learning behavior (Edmondson, 1999) and team learning activities (Bresman, 2010). Dosi and colleagues posited that "capabilities at the highest level reflects the outcome of a self-organizing, bottom-up process rather than realization of any comprehensive intention" (Dosi, Nelson & Winter 2000: 2). A premise of this article is that team learning routines are central to this emergent bottom-up process in ways that are not fully understood, hindering our understanding of how senior managers' decisions influence the evolution of organizational capabilities.

Baseline Model

The senior management team plays a central role in the dynamic capabilities framework (e.g., Teece, 2007). In the baseline model guiding the review, we see senior managers as directors who make decisions that create a context in which varied learning routines emerge to develop critical organizational capabilities. As such, we view the organization as a multiteam system (MTS), in which multiple teams pursue different short-term goals but share at least one common long-term goal, and in so doing exhibit some sort of interdependence with at least one other team in the system (Mathieu, Marks, & Zaccaro, 2001, p. 290). In organizations, multiple teams must share and coordinate the distributed, multi-dimensional tasks needed for the system to achieve superior performance. Therefore, to enable strategic change, each of the component teams in the system need to engage in the learning routines most valuable for the organizational capabilities it supports.

In line with our reasoning, Argote and Miron-Spektor (2011) differentiate between the "active context" through which learning occurs and "latent context" that shapes the active context. The active context (i.e., team members) performs tasks, whereas the latent context is

not capable of action. The "managerial decisions" we refer to in the antecedent box of our baseline model are decisions by senior managers that shape the latent context, such as which individuals are members of a team, what tools they have, which tasks they perform, and under what structures (Argote & Levin, 2020). Ultimately, considering the number of teams working across a single organization, their learning and the influence of that learning on capability development, these decisions comprise the strategic leadership needed from senior managers to influence an overall enterprise (Finkelstein, Hambrick, & Cannella, 2009).

------ Insert Figure 1 about here ------

Review Plan

We reviewed the past 15 years of team learning research (2007-2021), where team learning is treated as a team process. This perspective defines team learning in terms of the activities of the learning process (Edmondson, 1999; see Edmondson et al., 2007). It is rooted in the input-process-output (IPO) model, which posits that team members' behaviors constitute a process that transforms input conditions into performance outputs (Hackman & Morris, 1975; McGrath, 1964). We used a deliberately broad search strategy to identify a set of articles. Table 1 presents the scope of our review, along with the inclusion criteria we used to select articles.

------ Insert Table 1 about here ------

The goal of our review is to consider how managerial decisions give rise to different learning routines in teams, which in turn shape organizational capabilities—a core construct in strategy research. Our focus on the intersection between strategy and team learning lent itself to examining studies of real teams in real organizations (rather than lab or student teams) because it is difficult to simulate the conditions that surround teams at work over time as they make decisions and confront changes in their context. Moreover, as presented in Table 2, identifying 96 studies of real teams in real organizations provided a sufficiently large

set to review, with considerable variety in team task, size, duration, and industry context. We join a growing stream of work in team effectiveness research that recognizes the value of field research to understanding the phenomena of teamwork in organizations—as well as the many challenges such research poses (e.g., Kerrissey et al., 2020; Shuffler & Cronin, 2021). The review uncovered a variety of conceptualizations and measures of team learning that could be linked to organizational capabilities, in addition to managerial decisions. Thus, we can provide insights with clear relevance for bridging team learning and strategy research.

------ Insert Table 2 about here ------

SYNTHESIS OF 15 YEARS OF TEAM LEARNING RESEARCH

Our review of the literature reveals almost as many scales measuring team learning as there are team learning studies. This measurement heterogeneity poses a challenge for linking this body of work to strategy research, making it difficult to offer more than generalized linear relationships, such as "learning in teams supports better organizational performance." Becoming more precise about how team learning differs across studies may help us identify relevant choices and trade-offs, essential concepts in strategy scholarship (Pisano, 2017). In this vein, we first draw from the growing body of work on team learning to understand conceptual differences in team learning types, and we then use the results of this work to guide our integrative review. We see this approach as a promising path forward because it allows us to gain more specificity about the team learning routines studied over the past 15 years. We hope that the types of team learning that emerge from our review can pave the way for a set of clearly defined concepts that in turn can be quantified, enabling us to articulate their relationships with organizational capabilities. Ultimately, predictions associated with team learning and organizational capabilities should be testable and subject to disconfirmation.

We took an analytical approach informed by the literature to evaluate each team learning scale found in the reviewed empirical studies. We adjusted our analytical lenses as we progressed to ensure that we adhered to criteria for rigorous typologies outlined in the literature (Delbridge & Fiss, 2013; Doty & Gluck, 1994). Several theory papers propose types of team learning (e.g., Argote and Miron-Spektor, 2011; Bunderson & Reagans, 2011; Gebert et al., 2010). We considered each of them as we rated the team learning scales. We also included other typologies from team research, such as the types of knowledge in team mental models (Cooke et al., 2000) and the content of the conflict found in teams (O'Neill et al., 2013). Given the nature of the scales used to measure team learning, however, some typologies were more challenging to apply—that is, we could not determine which type was present in a study. For instance, in reviewed studies, it was difficult to determine whether knowledge developed in a team was new to that team, or not—a key distinction between *knowledge creation* and *knowledge retention* (Argote and Miron-Spektor, 2011)—or if knowledge shared between team members related to the *task* or to the *process* of achieving the task.

The dimensions that generated high levels of inter-rater agreement were internal vs. external and exploration vs. exploitation. Specifically, prior research has distinguished between *internal* and *external* team learning (Ancona & Caldwell, 1992; Wong, 2004). This refers to whether learning occurs within the team (carried out by team members in interactions with each other) or across the boundary between the team and its environment (carried out by team members interacting with non-members). Team scholars have also noted that team learning can be oriented towards *exploration* or *exploitation* (Edmondson, 2002; Taylor & Greve, 2006; see March, 1991). Exploration involves creative insights and developing new things, while exploitation is usually related to knowledge integration and doing the same things better or more efficiently.

These conceptual distinctions are compelling. However, the multiple iterations of our review showed that some team learning scales include items that measure both internal and external behaviors or fall in the middle of the exploitation-exploration continuum. With the help of three research assistants, we thus rated all team learning scales again, using a numerical evaluation: from 0 (internal, exploitation) to 10 (external, exploration). Calculated with an intra-class correlation based on consistency between raters (Neuendorf, 2002), we achieved satisfactory levels of inter-rater agreement, ranging from .80 to .89. This allowed us to better specify each team learning routine by considering which include patterned behaviors at the extremes of the two dimensions and those in the middle. Table 3 presents the six variations in team learning routines that emerged from this review of empirical studies with team learning measures, along with a representative scale measuring each.

------ Insert Table 3 about here ------

Team Learning Routines and Organizational Capabilities

To link team learning routines to organizational capabilities, we analyzed the team samples in each of the papers reviewed. Two research assistants and the two first authors coded them based on a common understanding of operational versus dynamic capabilities. Operational capabilities represent an organization's capacity to exploit its resource base through refining processes that repeat, leverage, and sustain past actions; they focus on increasing efficiency and reducing variation (Martin, 2011). Dynamic capabilities represent an organization's capacity to purposefully create, extend, or modify its resource base in distinctly different ways from past actions (Martin, 2011). At the team level, these categories translate into outcome measures of efficiency or quality for operational capabilities and creativity or innovativeness for dynamic capabilities. In some papers, however, it was not clear if the teams studied supported operational capabilities or dynamic capabilities. First, researchers tend to assess "overall effectiveness" or "general performance," which can include both

efficiency/quality and creativity/innovativeness. Second, what counts as creative outputs for some kinds of teams—e.g., customer service teams—does not necessarily fall in the category of dynamic capabilities. Similarly, R&D teams' performance sometimes may be measured in process improvements or in sustaining current products and services, thus not fundamentally contributing to changing the organization's resource base. Fortunately, team studies generally provide enough information for us to properly assess organizational capabilities by considering both the outcome measures and the nature of the teams studied. Therefore, we began our analysis with a close reading of each study's methods section, and after some iterations, we achieved satisfactory inter-rater agreement (.81) in our classification. We were thus able to identify if teams' learning routines in the studies we reviewed were supporting operational or dynamic capabilities.

We found more studies (51) in which the teams' performance fit into the operational capabilities category than into dynamic capabilities. This is unsurprising because there are more opportunities to gain access to large samples of teams that focus on leveraging the present (e.g., sales or production teams) than to large samples of teams creating the future (e.g., new product development teams). Importantly, teams in the operational capabilities category are not devoid of innovation or creativity, which can be used to improve current organizational processes or goals (Pisano, 2019). Likewise, research and development teams can take time to improve existing methods or processes (Pisano, 1994). In sum, both kinds of teams—those that develop operational and dynamic capabilities—can engage in exploring and exploiting, but each typically has a dominant aim in one or the other category.

We also found 24 studies that fit into the dynamic capabilities category; the teams studied had radical creativity or radical innovation as an outcome, focused on performance factors aligned with the development of new products or services, or studied the quality of decisions relating to new market penetration or new product launch. In what follows, we

describe how each type of team learning is linked to one or both types of organizational capabilities.

Internal-Exploitation learning in support of operational capabilities. This type of team learning is largely internal and exploitative. About half of the studies with this learning routine emphasize within-team knowledge-sharing behaviors, which include documents and reports and know-how or tacit experience with a task with the aim of better coordinating collective action (Faraj and Sproull, 2000). The other half relied on West and Carter's measure of team reflexivity (1998), which emphasizes reflecting on—and adapting accordingly—team goals and the methods to reach the goals (see also Schippers, Edmondson, & West, 2014). The measure demonstrates positive performance benefits for teams that support operational capabilities.

In particular, research showed that teams that honed such learning routine could better apply their knowledge to their everyday problems and, as a result, achieved higher quality output (tax consulting teams in De Jong & Elfring, 2010; medical teams in Schmutz, Lei, Eppich, & Manser, 2018), were more effective at meeting task requirements (financial branch management teams in Aubé, Francoeur, Sponem, & Séguin, 2021; management and project teams from various sectors in De Dreu, 2007; various teams from energy and petrochemical sectors in Choi, Lee, & Yoo, 2010; primary health care teams in Schippers, West, & Dawson, 2012; various teams from various sectors in Van der Vegt, de Jong, Bunderson, & Molleman, 2010a; various teams from the public sector in Hoogeboom & Wilderom, 2020; project teams in IT industry in Imam & Zaheer, 2021), better satisfied their clients (patient care teams in Romanow, Rai, & Keil, 2018), and generated more revenue for the organization (retail outlet teams in Greer, Homan, Hoogh, & Hartog, 2012; sales teams in Sung & Choi, 2012; sales teams in Rapp, Bachrach, Rapp, & Mullins, 2014). These teams were seen as more resilient (various teams from the childcare sector in Hartmann, Weiss, Hoegl, & Carmeli, 2021) or

more creative (various teams from the IT sector in Hu, Erdogan, Jiang, Bauer, & Liu, 2018; various teams from different sectors in Zhang, Tsui, & Wang, 2011), as were their members (sales teams in Gilson, Lim, Luciano, & Choi, 2013).

Internal-Exploitation learning also supports continuous improvement or incremental innovation, such as improving quality or current products or services and considering alternative work methods and procedures. For instance, we found this in several studies, including one with 96 R&D teams from a large IT company (Cheung, Gong, Wang, Zhou, & Shi, 2016), one with 31 global teams representing a common functional area or a phase in the production process at a multinational mining and minerals processing firm (Gibson, Dunlop, & Cordery, 2019), another with 219 stable work teams across the hierarchy operating in various industries (i.e., software, manufacturing, telecom, biotech food processing) (Hu & Randel, 2014), and finally a study of work teams responsible for management and operational tasks in the public (87) and private health sectors (69) (Madrid, Totterdell, Niven, & Barros, 2016). Fall risk reduction teams from small rural hospitals were able to reduce inpatient fall rates by implementing best practices at the end of projects (Reiter-Palmon, Kennel, Allen, & Jones, 2018); self-managing production teams in a large truck manufacturing plant of the Volvo Company improved output quality (zero-defect percentage) (Van der Vegt, Bunderson, & Kuipers, 2010b); and primary health care teams continuously improved through enriched working practices, enhanced services for patients, updated administrative systems, and more (Schippers, Hartog, Koopman, & Van Knippenberg, 2008). This stream of research thus offers considerable support for the positive effects of Internal-Exploitation team learning on performance improvement across numerous industry contexts.

Examples also include Jiang and Chen (2016, Study 2), who examined innovativeness in the form of manufacturing process improvement and the introduction of new management policies in 72 stable teams from various functional areas in various industries (i.e., chemical

products, electronic and electrical equipment and components, medical and optical devices, banking, and information technology) and found improvements attributable to Internal-Exploitation learning. Li, Lin, and Liu (2019) also found that this team learning routine boosted incremental creativity—adaptations to existing processes/products already used by the firm—in 135 work teams from diverse high-tech industries (i.e., computer systems, electronics, communications, optoelectronics, semiconductors, and integrated circuit design), and Shin (2014) found that it enabled 98 works teams from the finance, service, and manufacturing sectors to be more creative at improving their performance. For their part, Liang, Shu, and Farh (2018) showed that this form of learning supported 78 pharmaceutical R&D teams in improving the quality of products and services. Whether the teams in this cluster of studies are more innovative and creative than those in the prior cluster, or whether the researchers perceived the improvements studied in this way, is difficult to determine. The evidence linking team learning to valued performance improvements is striking in its consistency.

The results are mixed in the context of teams that support dynamic capabilities. In their study of 44 project teams (business development and new product and application development) at a biopharmaceutical firm, Jiang and Chen (2016, Study 1) found that teams that enacted Internal-Exploitation learning were more innovative. Bresman's (2010) study of 62 teams in the R&D department of large pharmaceutical firms also finds a positive effect of this learning. However, in other studies of teams supporting dynamic capabilities, null effects on performance outcomes were reported. Notably, this type of team learning did not influence software quality or project efficiency in Gopal and Gosain's (2010) study of 96 product development teams. It also did not boost the innovativeness of the 61 R&D teams that Litchfield, Karakitapoğlu-Aygün, Gumusluoglu, Carter, and Hirst (2018) studied in manufacturing, software, and electronics companies. Also, studies of 45 and 25 R&D project

teams at a telecommunications company (Huang, Hsieh, & He, 2014) found no direct relationships between this learning routine and individual members' ability to come up with creative ideas, and Huang (2009) found no effect of this team learning routine on the overall project performance of 60 high-tech R&D teams. Finally, focusing on performance of individuals nested in 21 software development teams, Urbach, Fay, and Goral (2010) found that this team learning routine supported implementing new working methods and techniques in the pursuit of current goals—but not in the generation of new goals. Overall, evidence between this learning routine and the performance of teams supporting dynamic capabilities is relatively weak. Part of the explanation for this may be that Internal-Exploitation learning is more directly related to improved operational capabilities than to development of dynamic capabilities. Still, it's also possible that dynamic capabilities are difficult to measure in the short term and may take months or years to take shape and yield results.

External-Exploitation learning in support of operational capabilities. The simple shift from an internal to an external learning emphasis creates a second form of team learning. It captures a team's capacity to gather knowledge from non-members who have had similar experiences in the past. In this way, teams can learn *vicariously* through the experience of teams working on a similar project or in other organizations. By learning from others' experiences, teams help the organization avoid past mistakes or skip unnecessary steps to complete the team task. It has been studied extensively as an outcome (e.g., Epple et al., 1991; Darr et al., 1995), but less as a team process. External-Exploitation learning has been shown to support operational capabilities. For instance, Haas (2010) studied 100 project teams at an international development agency and found that this learning routine predicted, albeit weakly, the projects' ability to meet objectives (a form of effectiveness). In another study of 135 information systems development project teams from two large IT companies (IT manufacturing and IT outsourcing businesses), Park and Lee (2014) found that this

learning routine predicted overall performance in terms of productivity, adherence to schedule and budget, quality of deliverables, and goal achievement. Bresman (2010) studied teams supporting dynamic capabilities—teams in the R&D department of large pharmaceutical firms—but found no direct relationship between this type of learning and team performance. Overall, potentially due to the small number of studies that include it, this form of team learning has shown some evidence in direct support of teams' performance enabling operational capabilities, but not in the context of dynamic capabilities.

Internal-Balanced learning in support of both operational and dynamic capabilities. Some team learning is internal and encompasses both exploration and exploitation. Most of the studies that assess this learning routine drew from van Knippenberg and his colleagues' work, which identifies the elaboration of task-relevant information and perspectives as a key mechanism through which team diversity pays off (Van Knippenberg, De Dreu, & Homan, 2004; Van Knippenberg & Schippers, 2007). It presents teams as information processors, and focuses on the exchange of information and perspectives between team members, as well as on the consideration and integration of the latter by team members in relation to the team task. The scales developed to assess this learning routine (e.g., Kearney et al., 2009) include exploitation-oriented items such as considering all viewpoints to narrow down options and come to an optimal solution or decision, which is similar to the previous form of learning as measured by Carter and West (1998). However, Internal-Balanced scales emphasize the uniqueness of the information or viewpoints shared and considered and thus comprise idea generation activities akin to exploration. We therefore use the term "balanced" to imply that teams that scored high on such scales both explore and exploit to a great extent, whereas those that scored low engage in little exploration and little exploitation.

Internal-Balanced learning has been shown to boost the performance of teams that support operational capabilities. Leroy, Hoever, Vangronsvelt, and Van den Broeck (2020) found that goal achievement by 37 teams from a large retail company was positively influenced by this learning routine, while Maynard, Mathieu, Gilson, Sanchez, and Dean (2019) showed that it enhanced output quality and timeliness of 63 global virtual supply chain teams (responsible for all software, hardware, and retail store solutions). Kearney, Gebert, and Voelpel (2009) showed that this kind of learning heightened overall effectiveness (efficiency, outcome quality, goal achievement) of 83 work teams from various functions in eight different organizations from various industries (i.e., software development, pharmaceuticals, insurance, telecommunications, manufacturing, media and entertainment, food and energy). Savelsbergh and colleagues found similar results in the banking (Savelsbergh, Heijden, & Poell, 2009) and construction (Savelsbergh, Gevers, Heijden, & Poell, 2012) industries. Also, in their study of 145 work teams from various industries (i.e., telecommunication, heavy equipment, and banking), Chun and Choi (2014) found that Internal-Balanced learning increased task conflict and decreased relationship conflict, which respectively increased and decreased effectiveness in teams. It can also spur continuous improvement in production teams (Friedrich et al., 2016), lead to more creativity in stable work teams from various industries (i.e., manufacturing, financial services, trading, retailing, education/training, and IT) (Lu et al., 2017), and more innovativeness from project teams tasked with quality control, consulting service, or process improvement (Huang, Liu, Cheung, & Sun, 2021).

Internal-Balanced learning has also been shown to boost the performance of teams supporting dynamic capabilities. Four studies—Gong et al. (2013) in their study of 100 R&D teams in the telecommunication, electronics, chemical, aerospace, information technology, and pharmaceutical industries; Dong et al. (2017) in their study of 43 R&D teams from eight

high-tech companies; Chi and Lam (2021) in their study of 43 teams involved in the development and launch of new products in the high-tech industry; and Huang and Liu (2021) in their study of 106 special project teams from various industries—found that this learning routine boosted both the team's and/or the individual members' creativity. Similarly, Stephens and Carmeli (2016) found that this learning routine heightened product performance (delivery time, functionality, quality) and adherence to the budget for 122 technological innovation project teams (i.e., antenna transmission technology, guided weapons). Others found that it heightened the overall performance of 53 innovation teams developing new consumer goods at industrial R&D companies (Eisenberg et al., 2019) as well as of 52 project teams developing technological products in various industries (Carmeli, Levi, & Peccei, 2021). Finally, across two studies—one of 139 innovation project teams from two IT and pharmaceutical industries, and another of 995 inter-organizational R&D project teams—Kostopoulos et al. (2011) found that Internal-Balanced learning positively influences the team performance.

Contrary to the two previous forms of team learning (Internal-Exploitation and External-Exploitation), evidence from the past 15 years indicates that Internal-Balanced offers strategic benefits in varied contexts. Indeed, its link with valued performance of teams working in support of both operational and dynamic capabilities is salient and consistent across studies.

Balanced-Exploitation learning in support of both operational and dynamic capabilities. This inclusive form of learning includes most of the team learning behaviors discussed above—taking place inside and outside the team and oriented mostly towards exploitation, but with some exploration. It thus encompasses various team learning behaviors—in terms of the location of information acquired and discussed by team members and the target of the learning efforts. It is largely influenced by Edmondson's (1999) seminal

work on team learning, which was conceptualized and measured in a way that included acquiring and sharing information, asking for help and seeking feedback, and disclosing and analyzing errors. As described earlier, we use the term "balanced" to imply that teams that scored high on such scales learn from both inside and outside the team, whereas those that scored low engage in little learning either inside or outside the team.

Strong performance benefits have been associated with this encompassing form of team learning in the context of teams supporting operational capabilities. For instance, Popaitoon and Siengthai (2014) found that among 198 project teams in multinational companies in the automotive industry, those most engaged in such learning achieved higher short-run performance in terms of efficiency, impact on current users, and current business. Similarly, both Brueller and Carmeli (2011)—who studied 178 work teams from various industries (i.e., insurance, telecommunications, consumer good, software, and hotel)—and van Woerkom and van Engen, 2009 (2009)—who studied 84 work teams from 38 different organizations from other industries (i.e., public sector such as healthcare, education, police, and private sector such as retail, banking, food, and administration)—found that Balanced-Exploitation team learning boosted teams' overall effectiveness in terms of efficiency and output quality. This has also been found in a study of 61 work teams from other industries such as tourism, manufacturing, and food and beverage (Abrantes et al., 2018), and in a study of healthcare teams (Parker & du Plooy, 2021).

Balanced-Exploitation learning can also make teams more effective at updating how they achieve their goals in support of operational capabilities. For instance, Schaubroeck et al. (2016) and Walter and Van der Vegt (2012) found that stable work teams in various industries—82 from IT, healthcare, finance, higher education, and energy, and 27 from service, manufacturing, sales, and finance—were not only more effective, but also pursued incremental innovation more effectively and continuously improved their performance when

they most enacted this learning routine. Other research on neonatal care teams' ability to implement best practices in the context of technological improvement found that this type of experiential team learning predicted implementation success, whereas team learning focused on obtaining codified external knowledge did not (Tucker et al., 2007).

This type of team learning has also been shown to positively influence the performance of teams supporting dynamic capabilities. It was shown to improve the quality of strategic decisions such as penetrating occupied or new markets, launching a competitive attack or responding to a rival's competitive attack, and choosing core capability, technology, and products to pursue for 77 top management teams from diverse industries (i.e., food and beverages, medical equipment and pharmaceuticals, computers, infrastructure and construction, and finance) (Carmeli et al., 2012). Moreover, Hirst et al. (2009) studied 25 R&D teams and found that it pushed team members to be good role models for creativity and generate ground-breaking ideas as well as solve particularly complex problems. Therefore, as shown with the previous form of team learning, there is evidence of support of Balanced-Exploitation learning for the performance of teams enabling both operational and dynamic capabilities in organizations.

External-Exploration learning in support of dynamic capabilities. This type of learning is external and primarily oriented towards exploration. Most of this research traces its inspiration back to Ancona and Caldwell's measure of scouting (1992), which built on the work of Allen and colleagues (e.g., Allen, 1970, 1977; Allen & Cohen, 1969). These scholars showed that teams engage in "general scanning for ideas and information about the competition, the market, or the technology" (Ancona and Cladwell, 1992: 641) and that by doing so, they access new knowledge that can be recombined with existing knowledge to generate ideas and open up new opportunities.

Few studies of teams in the context of operational capabilities have considered External-Exploration learning, and the ones that did found no direct effect on performance (e.g., neonatal care teams in Tucker et al., 2007; new product development teams in Jiang and Chen, 2016). However, it has shown positive performance benefits for teams supporting dynamic capabilities. Indeed, in their study of 140 new product development project teams from manufacturing firms in high- and medium-high-technology sectors, Carbonell and Escudero (2019) found that External-Exploration learning enabled teams to develop superior products (beating the market). Bresman (2010) found a similar relationship in his study of 62 R&D teams, and Drach-Zahavy (2011) found that 49 interorganizational teams tasked with changing the health habits of the members of a community were more effective the more they enacted this learning routine. Beyond immediate performance, Popaitoon and Siengthai (2014) found that project teams could achieve better long-run performance—open a new market or a new line of products, or develop a new technology—if they engaged in this type of learning. Similarly, Brion et al. (2012) studied 73 new product development teams in manufacturing firms. They found that teams that most often enacted this learning routine contributed the most new technological competencies for future products for their organization. However, this did not consistently lead the new products to have greater commercial impact.

Finally, some research suggests that External-Exploration learning must be adopted judiciously. Gibson and Dibble (2013) studied 140 humanitarian documentary film-making teams and evaluated whether team learning predicted the film's impact and quality as evaluated by film festival viewers. This can be compared to users or customers evaluating the performance of a new product or service. The authors found that this form of learning had a curvilinear effect on performance, where moderate amounts of External-Exploration learning were associated with the highest performance levels. While this caveat is important to

consider in our analysis of this form of team learning, evidence from the past 15 years broadly indicates that it translates into valued performance benefits for teams supporting dynamic capabilities, but less so for teams supporting operational capabilities.

Balanced-Exploration learning in support of both operational and dynamic capabilities. This type of learning routine takes place both inside and outside the team and is oriented towards exploration. The scale behind Balanced-Exploration learning includes behaviors such as environmental scanning, idea generation and evaluation, experimentation, and improvisation. It has been shown to enhance the performance of teams that support dynamic capabilities. In their study of 142 innovation project teams from two the IT and pharmaceutical industries, Kostopoulos and Bozionelos (2011) showed that the degrees of innovativeness, quality, and work excellence were higher for teams that most enacted this learning routine. Zhang and Min (2019) showed similar results in their study of 92 new product development teams. In another study, Li et al. (2019) found that it boosted the radical creativity—discoveries of entirely new processes/products than what the firm currently does—in work teams from various high-tech industries.

This form of learning has also been shown to support teams supporting operational capabilities—it has been associated with teams' overall efficiency and output quality in a study of 71 information technology project teams delivering solutions to business clients (Magni et al., 2013). In another study, Magni and Maruping found similar results for customer-facing teams in the retail and financial industries. Therefore, while relatively limited in number, evidence from the papers included in our review indicates that Balanced-Exploration offers performance benefits for teams supporting both operational and dynamic capabilities.

Summary. Our review shows that research over the past 15 years has explored several different types of learning routines that can support operational or dynamic capabilities. We

find that five forms of team learning—Internal-Exploitation, External-Exploitation, Internal-Balanced, Balanced-Exploitation, and Balanced-Exploration—can produce performance benefits in support of operational capabilities, whereas research has shown that dynamic capabilities can be supported by four forms of team learning: Internal-Balanced, Balanced-Exploitation, Balanced-Exploration, and External-Exploration. It is worthwhile to note that three forms of learning from our typology did not emerge from our review: Internal-Exploration, External-Balanced, and Balanced-Balanced. We consider each of them later on as we reflect on the findings from the review and the opportunities they create for future research.

Managerial Decisions and Team Learning

Now that we have explored the range of routines through which team learning occurs, we turn to factors that form the context that shapes those routines. Research suggests that decisions senior managers make related to design profoundly impact team learning and performance, often in ways that are not entirely straightforward (Edmondson, 1999). We therefore draw from our review to help identify a set of managerial decisions that shape learning routines in teams through shaping team design. Team design is typically seen as having three aspects: structure, composition, and task (Stewart, 2006). We consider each in turn.

Team and Organizational Structure. Structure has been defined as the function and status of positions (Thompson, 1967), a system of constraints limiting appropriate behavior (Buck, 1966), and internal patterning of relationships (Thompson, 1967). Definitions of structure tend to emphasize the shaping of actions of organizational members. According to this view, entities are more structured when they shape more activities and constrain more action (Davis, Eisenhardt, & Bingham, 2009). Researchers typically consider structure as manifested in three core dimensions: specialization, hierarchy, and formalization (Montanari,

1979; Weber, 1947). Specialization is the horizontal division of labor (e.g., into tasks and roles), hierarchy is the vertical division of labor (e.g., into leaders and subordinates), and formalization is the explicit articulation of objectives, priorities, and procedures.

Given that structure constrains action, classic theory might imply that more team structure is likely to discourage team learning. Yet, empirical research suggests the opposite. In a study of production teams in a large high-tech firm, Bunderson and Boumgarden (2010) found that team structure helped facilitate Internal-Exploitation learning because it provided clarity about each team member's expertise and responsibilities, furthering the development of a transactive memory system within the team (Liang et al., 1995) and promoting a climate of psychological safety in which team members felt safe to take interpersonal risks (Edmondson, 1999). Several other studies found a similar relationship between this form of learning and elements of team structure, namely formalization with regards to team membership and the conduct of teamwork (Gibson et al., 2019; Li et al., 2019), group-level performance feedback (Van der Vegt et al., 2010a), and extrinsic incentives (Hu and Randel, 2014).

Bresman and Zellmer-Bruhn (2013) pushed further by investigating the combined effects of team- and organizational-level structure, and included two forms of team learning (Internal-Exploitation and External-Exploration) in their study of pharmaceutical drug development teams. They found that team-level structure stimulated both forms of learning (see also Li et al., 2019, who found similarly with regards to formalization). However, they also found that organizational-level structure was negatively associated with both forms of learning. Task autonomy constraints mediated the negative relationship between organizational structure and both forms of team learning. Importantly, investigating the interaction effect between team and organizational structure, the study found that organizational structure supported External-Exploration learning under conditions of less

team structure. Specifically, when teams had less team structure, the relationship between organizational structure and External-Exploration learning was positive. This suggests that although more organizational structure seems to hurt this form of learning in general, there are situations in which it helps.

Van der Vegt et al. (2010a) found similar dynamics with regards to power asymmetry and performance feedback. Their study showed that power asymmetry between team members is detrimental to Internal-Exploitation learning when individual performance feedback is high or when group performance feedback is low. On the contrary, power asymmetry boosts Internal-Exploitation learning when individual performance feedback is low or when group performance feedback is high.

Overall, we can conclude that structure is a blunt tool, in part because it encompasses numerous elements and thus eludes straightforward effects. Managers may wish to take multiple levels of structure and their interactions into consideration when making decisions about structures to support different forms of team learning, but more research is needed to identify reliable levers for action.

***Team Composition*.** Composition refers to how the team is staffed, such as how many individuals are on the team and how different or similar they are on a given individual attribute (e.g., experience, expertise, demographic) or situational feature (e.g., work location, functional affiliation) (Bell et al., 2018; Kerrissey et al., 2020). Despite efforts to push the field forward with diverse approaches to team composition (Mathieu et al., 2014), the studies in our review that considered team composition largely relied on compositional models that aggregate members' attributes or features (Kozlowski & Klein, 2000). Team composition variables can be summed up by the sheer size of the team and its boundedness, the tenure of team members and membership changes, and generic team members' attributes and their diversity. Synergies or process losses can occur when team members score similarly or

differently on a given attribute (Edmondson & Harvey, 2018). Team composition factors thus influence team behaviors, such as the ones at the center of team learning routines, and also influence performance (Mathieu et al., 2008). We consider these factors of team composition below.

Team size and boundedness. The size of the team—the number of team members—is one of the most common design decisions that managers make. This is reflected in our review, with 46 studies that include team size, most often as a control variable. Past research suggests that larger teams can accomplish more tasks, and thus are more effective than smaller teams (Hulsheger et al., 2009). Yet, larger teams may not be better at learning. In fact, only four studies showed that team size predicts—with small effects—different forms of learning, namely Internal-Exploitation learning (Haas & Cummings, 2015) and Internal-Balanced learning (Chi & Lam, 2021; Huang et al., 2021; van Woerkom & van Engen, 2009). For each of these forms of learning, the great majority of studies found no effect. Therefore, evidence is lacking with which to conclude that team size is a predictor on any form of team learning.

One study showed that larger teams benefited more from Internal-Exploitation learning than smaller teams (Schmutz et al., 2018). Indeed, small teams experienced no performance benefits from their learning, whereas average-sized and large teams improved significantly. Given the insights developed previously about this form of learning, managers should be mindful of the size of the teams they design to support operational capabilities.

Beyond the number of team members on a team, their degree of boundedness is an increasingly important variable in many organizations. First, individuals are increasingly part of multiple teams at once (Edmondson, 2012; Mortensen & Haas, 2018); teams have shifting membership (Kerrissey et al., 2020), and many teams span organizational boundaries (Edmondson & Harvey, 2017; Kerrissey et al., 2020). Among the studies we reviewed, few

considered these design elements or their influence on team learning; yet they appeared significant in those that did. Drach-Zahavy (2011) showed that health promotion project teams engage in more External-Exploration learning stimulated by part-time or peripheral members. In other words, when all team members were highly bounded—namely higher proportions of members who served for the full cycle of the project, worked full-time on the project, and contributed equally to the project—they engage in less learning. Pushing this perspective further, Chan et al. (2021) studied project teams and found that teams engage in more External-Exploration learning when team members are immersed in various inter-organizational project teams or intra-organizational project teams. However, when variety is high on both counts, the learning suffers. Overall, this design factor must be used with some caution by managers. Teams may benefit from having members who participate in multiple projects simultaneously, but their learning can suffer when their members are overly extended. Boundary-spanning behaviors such as the ones involved in External-Exploration learning are demanding for team members (Marrone et al., 2007), so aiming for balance may be the best solution for managers who want their teams to engage in such a learning routine.

Team tenure and membership change. The average time individuals have been on a team—team tenure—is another frequently considered design factor in the studies we reviewed. Twenty-nine studies—involving all forms of team learning—included tenure as a predictor of team learning or control variable, and no direct relationship was significant. However, membership changes were shown to affect some forms of team learning.

While it has been argued that stable teams can develop habitual routines that hinder their engagement in learning (Gersick & Hackman, 1990; Katz, 1982), team learning research has shown the opposite. In a study of cardiac surgery teams, membership stability was found to affect Internal-Exploitation learning but not External-Exploitation learning (Edmondson et al., 2003). The studies we reviewed go in the same direction. For instance, one study of self-

managing production teams considered the proportion of team members who voluntarily left the team over a one-year time period and found that it significantly hampered Internal-Exploitation learning (Van der Vegt et al., 2010b). In the same vein, Savelsbergh Poell, and Heijden (2015) found that membership stability over a year of teamwork positively influenced Internal-Balanced learning in project teams from various industries. Furthermore, a study of R&D teams showed that a change in membership stimulated this latter form of learning only for newly formed teams, whereas it hindered learning in long-serving teams (Hirst, 2009). In other words, the newcomers can stimulate Internal-Balanced learning compared to other newly formed teams that remain stable in their membership. Finally, both personal and professional familiarity promoted this form of learning in highly virtual settings (Maynard et al., 2019).

Membership stability may strengthen the benefits of team learning. In particular, Gibson and Dibble (2013) found that teams' External-Exploration learning turned into performance benefits when they counted on a consistent core set of members. In contrast, it hurt performance when most members had short-term and varied involvement. Put differently, temporary project teams' membership stability made it easier to integrate outside knowledge into their functioning so as to profit from External-Exploration learning.

Team generic attributes and diversity. The individual attributes of team members also can shape team learning and its performance benefits, so they are another key design factor that managers may account for (Mathieu et al., 2014). Team member attributes (i.e., team members' average industry experience) and their distributions (i.e., team educational diversity) can either serve as the boon or bane of team learning (Edmondson & Harvey, 2018), and several of the studies included in our review considered such design factors. We try to make sense of this vast territory of investigation here.

Regarding generic team attributes, the average age or gender of team members was assessed across several studies and showed no or inconsistent effects on the team learning routines. Similar null or inconsistent effects were found with leader gender and leader industry experience. More interestingly, the average industry experience of team members was not associated with Internal-Exploitation learning (Bresman, 2010; Bresman & Zellmer-Bruhn, 2013), but was positively linked to External-Exploration learning (Bresman & Zellmer-Bruhn, 2013). We can assume that more experienced individuals have developed more relationships over time; extra-team links that can serve as a springboard for this form of learning routine (Drach-Zahavy, 2011). Surprisingly, however, team-generic education level was rarely assessed and showed inconsistent influence when it was (Carmeli et al., 2021; van Woerkom & van Engen, 2009).

We now turn to diversity, which was operationalized in three different ways depending on the attribute (see Harrison & Klein, 2007 for a full discussion). Some studies considered degrees of separation, that is, the number of differences among team members on continuous attributes such as age, education, tenure, and experience, each ranging from high to low and operationalized using the standard deviation or mean Euclidean distance (e.g., Chan et al., 2021; Gilson et al., 2013; Harvey, 2015; Huang & Liu, 2021; Shemla & Wegge, 2019). Many studies considered degrees of variety to emphasize variety or the clashes or complementarities between categorical attributes (i.e., 25-30 years old, rather than the age number itself). Age, education level, tenure, experience, but also gender, education domain, functional affiliation, ethnicity, and nationality were then operationalized using the Blau or Teachman index (e.g., Cheung et al., 2016; Drach-Zahavy, 2011; Eisenberg et al., 2019; Greer et al., 2012; Jiang & Chen, 2016; Kearney et al., 2009; Kostopoulos & Bozionelos, 2011; Shemla & Wegge, 2019; Shemla et al., 2020; Van der Vegt et al., 2010a; Zhang et al., 2011). Finally, some studies considered degrees of disparity, that is, the proportion of

differences on attributes such as age, education, and tenure, which was operationalized using the coefficient of variation (standard deviation divided by mean) (e.g., Bunderson & Boumgarden, 2010; Jiang & Chen, 2016; Van der Vegt et al., 2010b; Zhang et al., 2011). Gender was also considered a disparity in one study that operationalized it with the proportion of female members on the team (Jiang & Chen, 2016).

From this extensive review, we can conclude that team learning research has looked at the influence of team diversity on team learning and performance in sophisticated ways. However, our ability to draw firm conclusions from this research is relatively weak with respect to learning routines within the team. Insignificant and inconsistent effects are the norm with both Internal-Exploitation learning and Internal-Balanced learning. The practical implication of these results is, essentially, that diversity is a difficult design factor for managers to manipulate as a way to influence the learning that occurs inside a team. What matters is not so much the objective measure of diversity, but rather how team members react to it, which is contingent on factors that fall outside the realm of managerial decisions, such as team members' perception of their differences (Harvey, 2015; Mehta & Bharadwaj, 2015), their levels of trust (Cheung et al., 2016), their collective identification with the team (Shemla & Wegge, 2019), other personality factors (Kearney et al., 2009), and their leader's visionary behaviors and categorization tendencies (Greer et al., 2012).

We arrive at different conclusions for external learning. Although the evidence is much more limited, the studies we reviewed showed some patterns. Although Jiang and Chen found no relationship between gender, age, or education disparities in work teams supporting operational capabilities and External-Exploration learning, research on special interorganizational project teams in the health sector (Drach-Zahavy, 2011), and temporary project teams tackling engineering challenges (Chan et al., 2021) found that External-Exploration learning was stimulated by deep-level diversity in teams, whether that meant

members with high degrees of separation between their levels of education (Chan et al., 2020) or high degrees of variety in their functional affiliations (Drach-Zahavy, 2011). Overall, the interpersonal and technical challenges that make it difficult to profit from diversity through internal learning (Edmondson & Harvey, 2018) are likely outweighed when it comes to external learning fueled by the outgroup relationships team members develop with others (Ancona & Caldwell, 1998). Managers may be able to integrate this facet of team design in decisions when setting up teams to engage in External-Exploration learning.

Team Task. The final aspect of team design is task design, consisting of guidelines and task-driven prescriptions for coordinating work tasks (Campion et al., 1993; Cohen & Bailey, 1997). Four task-related factors emerged from the review: resources, autonomy, interdependence, and complexity.

Resources. We consider resources broadly as a source of supply or support that can be drawn on by a team to function more effectively. A study of 98 primary healthcare teams found that the physical work environment (spaciousness, quality of the working area, facilities, and general condition of the building) negatively moderated the relationship between Internal-Exploitation learning and team performance, but the team's workload positively moderated that relationship (Schippers et al., 2012). Others have found no relationship between team workload (De Dreu, 2007), work hours (Tucker et al., 2007), or resources (the availability of equipment, personnel, and financial resources) and team learning routines (Bresman, 2010; Bresman & Zellmer-Bruhn, 2013). And overloaded teams engaged in less Internal-Balanced learning (Savelsberg et al., 2012). Overall, the influence of resources on team learning, according to the review, was not well established. However, we are hesitant to draw conclusions from this finding. Resources were rarely a focus in the reviewed studies, and the weak relationships may be a function of low variance rather than the importance of resources *per se*.

Autonomy. Teams enjoy varying degrees of task autonomy, with more or less freedom to make decisions and adapt to changing conditions. Autonomy is typically achieved by empowering team members with more information and decision-making authority to experience more self-determination (Spreitzer, 1995). Some research suggests that autonomy may be a hindrance when teams clearly understand their tasks (Manz & Stewart, 1997). In this context, clear hierarchical direction can increase efficiency (Adler & Cole, 1993). However, most studies find that autonomy improves internal motivation (Cohen & Ledford, 1994) and allows teams to improve through adaptation to changes in work environments and demands (Manz & Stewart, 1997; Pearce & Ravlin, 1987). Autonomy helps effective intrateam processes develop, making the team as a whole, rather than a leader, responsible for performance (Beekun, 1989). Most studies focused on team learning take place in contexts where team adaptation to contextual demands is helpful, making it unsurprising that our review found a largely positive influence on team learning from task autonomy. Indeed, it has been found to promote team learning routines directly for Internal-Exploitation (Bresman & Zellmer-Bruhn, 2013; Jiang & Cheng, 2016) and External-Exploration learning (Bresman & Zellmer-Bruhn, 2013), and to positively moderate the relationship between team learning and performance for Internal-Exploitation (Urbach et al., 2010) and External-Exploitation learning (Haas, 2010).

Interdependence. With a few exceptions (e.g., Park & Lee, 2014), research on interdependence in teams focuses on within-team relationships. This is in contrast to autonomy, which focuses on the relationship between the team and the outside. In a highly interdependent team, members depend on each other for materials, knowledge, and inputs (Campion et al., 1993). Designing teams with high interdependence motivates team members to develop shared expectations about roles, processes, and norms (Stewart & Barrick, 2000). Research has found that interdependence among members can have a curvilinear relationship

with performance (Stewart & Barrick, 2000; Wageman, 1995). High and low levels of interdependence are associated with higher performance than moderate levels of interdependence. Interdependence thus ranges from low (members function as individuals) to moderate (some member interaction) to high (extensive interaction among members). This curvilinear relationship possibly explains our inconclusive finding about the relationship between interdependence and team learning routines. Several studies found no significant relationship (Chuang et al., 2013; De Dreu, 2007; Dong et al., 2017; Gong et al., 2013; Hirst, 2009; Jiang & Chen, 2016; Magni & Maruping, 2013; Magni et al., 2013). Only for Internal-Exploitation learning have researchers found a significant and positive relationship between interdependence and team learning (Haas & Cummings, 2015; Van der Vegt et al., 2010a). Furthermore, one study found that an interdependent relationship with clients promoted External-Exploitation learning (Park & Lee, 2014).

*Complexity***.** Task complexity is commonly defined as a task's demand for planning, decision-making, and thinking (Hacker, 2003). It describes the degree to which there is a need to integrate complicated interactions among different mental and physical aspects of a task. The opposite of a complex task is a routine task. More complexity requires more learning, almost by definition, and other reviews have noted a strong relationship between task complexity and team learning (Edmondson et al., 2007). A closer look at the studies included in our review reveals some nuance to this general finding.

While some studies found no relationship between team learning and task complexity (e.g., Jiang & Chen, 2016; Chun & Choi, 2014; Kearney et al., 2009), a number of studies reported a strong positive relationship. Teams in one study (Schmutz et al., 2018) engaged in more Internal-Exploitation learning when their tasks were more complex, and a similar result was found for Internal-Balanced learning (Friedrich, Sjöberg, & Friedrich, 2016). Significant correlations are also found for both Balanced-Exploitation and External-Exploitation learning

in a study by Popaitoon and Stiengthai (2014). However, performance benefits from team learning may be more difficult to reap when a task is highly complex (Haas, 2010; Urbach et al., 2010). Indeed, learning may be more demanding and thus take more time when the task is highly complex.

Summary. Together this synthesis allows a more detailed framework than our baseline model, presented in Figure 2. We can now distinguish between different forms of team learning and link them to different kinds of organizational capabilities and to managerial decisions that influence team learning to promote performance benefits.

------ Insert Figure 2 about here ------

A RESEARCH AGENDA FOR A STRATEGIC VIEW OF TEAM LEARNING

This review surfaced important insights about reliable patterned behaviors as the source of learning in organizations: team learning routines. It organizes the insights into a model of capability development by linking six team learning routines with organizational design decisions that senior managers can make to shape the long-term performance of organizations. These decisions relate to structure, composition, or task, and they can influence both the team learning routines and their performance benefits. In doing so, the model introduces a strategic view of team learning, helping move strategy scholars' locus of attention from market structure to the organizational ability to integrate, build, and reconfigure competencies (Teece et al., 1997).

The review specifies meso-level activities that contribute to a strategy perspective that emphasizes the importance of the resource base of organizations in adapting to and shaping the external environment (Helfat et al., 2007). Over time, organizations rely on both operational and dynamic capabilities (Helfat & Winter, 2011; Martin, 2011), which encompass bundles of routines—that is, action patterns that are recurring, selectable, and set in an organizational context (Cohen et al., 1996; Nelson & Winter, 1982). Through these

bundles, organizations can move from intention to outcome in a regular and somewhat predictable manner. To understand how this works, strategy scholars have suggested deconstructing organizational capabilities at the micro-level of individuals; this led to significant research on the strategic agency of senior managers (Helfat & Martin, 2015; Helfat & Peteraf, 2015). Managerial decisions have been shown to explain the superior performance of organizations (Adner & Helfat, 2003; Schilke et al., 2018). At the same time, the dynamic capabilities framework allows for multilevel activities, which can take place on the factory floor, in the R&D lab, or the boardroom, but which must be integrated – because only through the interlocking activities of multiple participants can organizations achieve long-term performance (Teece & Pisano, 1994; Teece et al., 1997). Juxtaposing research on organizational capabilities and the associated abilities of managers with a review of the team learning literature allowed us to build a conceptual model that highlights the importance of team learning routines in developing organizational capabilities.

Several new insights emerge from our synthesis of the literature, which help leverage team learning to a strategic level. We believe that the typology of team-learning routines we discerned in the body of studies of team learning serves as a valuable tool for analyzing the literature and for conducting future research to add to what is known about the activities that comprise work-relevant learning in organizations. Our work thus benefits both the fields of strategy and organizational behavior. It offers avenues for cross-boundary research that frame team learning as a strategic issue, identifies missing categories or knowledge that deserve more attention, and helps further our understanding of organizations as multi-team systems. The model shown in Figure 2 is necessarily complex: no individual research project could or should take it on in its entirety. The best way forward is to examine parts of the whole. To this end, the model helps surface the complexity of the entire system and what parts have yet to be thoroughly examined.

Team Learning Types and their Relationship with Organizational Capabilities

Overall, our review of team learning research provides new insight into how teams can be considered the repositories of learning routines in organizations (Argote, 1999; Edmondson, 2002). This question has been at the center of evolutionary economics for decades (Dosi et al., 2000; Nelson & Winter, 1982), but the location and features of learning routines have largely remained a black box (Cohen et al., 1996; Zahra et al., 2020). Strategy research has viewed routines for communication and coordination as necessary to develop and transfer knowledge throughout the organization, enabling it to learn and adapt (Helfat & Raubitschek, 2000; Teece & Pisano, 1994; Teece et al., 1997; Winter, 2003). However, the actual activities that underpin learning have been left untouched as "complex patterns of interactions" (Grant, 1996: 115; Zahra et al., 2020). As our review shows, research in organizational behavior has developed a broad and deep appreciation of how work teams acquire, process, share, and consolidate knowledge through a set of activities that form learning routines. Those routines represent a realistic, empirically informed account of multi-person action—essential for building useful theory about organizations and their routines (Cohen et al., 1996). Organizational capabilities are said to "rest on accumulated learning that can atrophy if not exercised" (Helfat & Campo-Rembado, 2016: 254), and our review shows that team learning research enables a fine-grained understanding of the activities involved in that exercise.

Some of the value of our review lies in the appreciation of the differences in form that team learning can take and how these may support different kinds of organizational capabilities. Notably, identifying these differences may force future researchers (and ultimately practitioners) to consider trade-offs related to adopting different types of team learning routines. Over the years, dynamic capabilities scholars have emphasized learning as a recipe for superior organizational performance, suggesting that organizations must learn to survive and assuming that more learning is always better. As a result, most theory

development in that stream of research has neglected strategic choices or trade-offs (Pisano, 2017). Our review shows that organizational learning involves strategic choices, and implies that organizations may fail if they make the wrong ones.

Organizational behavior scholars tend to equate team performance across studies (e.g., Wiese, Burke, Hernandez, & Howell, 2021). However, despite sharing the same label, performance outcomes predicted by team learning in one study (e.g., sales teams) do not necessarily equate to those predicted in another (e.g., new product development teams); performance can mean many things, including quality, efficiency, innovation, and growth. A learning routine's impact does not emerge solely from the *extent* to which it is performed (Stadler et al., 2013); some learning routines may generate more valuable knowledge and support different performance benefits depending on the context, and others may work best when practiced not too infrequently nor too frequently. Lack of clarity about the relationship between types of team-learning routines and types of task contexts—or, as we argue in our review, types of organizational capabilities supported by the studied teams—hinders our understanding of the consequences of the learning. This lack of specificity can lead to confusing findings—potentially contradictory empirical results that could be explained by overlooked contextual characteristics such as the ones typically provided in the strategy literature. Future research on team learning can therefore benefit from our typology because it sets parameters that can help contextualize the effectiveness of teams and the organizational (capability) benefits of their learning. By explicitly linking team learning with organizational capabilities, future research can contribute to a more sophisticated understanding of when a certain type of team learning is valuable.

Missing in Action: Managerial Decisions and Team Learning Routines

Our review of the literature shows that balanced learning—in location or focus—seems to produce broader benefits for organizations. Balanced learning routines were shown to

stimulate the performance of teams working to support both operational and dynamic capabilities. The opportunity to reflect on an extensive collection of studies of team learning in real organizations sheds new light on these dynamics. Engaging in both external and internal learning allows teams to bring in new information and also to find ways to apply and improve its application in their context. The same is true for the focus of learning: exploitation, with continuous improvement, can be inadequate when teams confront dramatic changes in their environment; exploration without developing ways to streamline and exploit new ideas and practices may fail to produce performance results.

Yet, our review also shows that we know very little about the managerial decisions that stimulate the balanced forms of team learning. Prior research offers ideas about which kinds of decisions may affect balanced team learning routines – notably those related to structure, composition, and task – but few studies have tested these ideas in empirical settings. There is ample room to develop a more comprehensive understanding of how senior managers can help shape balanced learning routines in teams.

In addition, more knowledge is needed about how managerial decisions influence external learning routines aimed at exploitation. It seems many researchers, at least implicitly, equate external learning routines with exploration. While intuitively appealing, this mental model has created a blind spot. In fast-moving environments, efficiency can be critical to success for teams, and they cannot afford to repeat mistakes or reinvent the wheel. Therefore, learning routines to exploit knowledge generated by other teams can be crucial (Bresman, 2010). Research on how senior managers can help facilitate such learning is thus an essential direction for future research.

Our review also shows that team learning research has neglected three forms of team learning. First, research has largely ignored Internal-Exploration learning. This is surprising given its relevance in today's organizations: consider agile methodologies (Beck et al., 2001),

design thinking (Brown, 2008), and the lean start-up approach (Ries, 2011). Of course, there is a risk of spending too much time thinking deeply, so as to reduce the uncertainty of a new opportunity, rather than experimenting quickly to learn through action. For example, 3M is noted for profiting from this kind of learning (e.g., von Hippel, Thomke, & Sonnack, 1999). Its teams' many discoveries through Internal-Exploration learning, including the infamous Post-It Note and its many derivative products, support dynamic capabilities by directing managers' attention towards particular opportunities they can scrutinize further and potentially invest resources to seize (Teece, 2007).

Internal-Exploration learning is also valuable when opportunities are being seized. Research has shown that products or services take longer to launch and are less successful when the teams developing them do not actively engage in this form of learning (Brown & Eisenhardt, 1995; Wheelwright & Clark, 1992). The routine enables teams to generate new insights into problems where critical information is lacking (Thomke, 1998). Teams can better assess the feasibility of their ideas because problems reveal themselves through fast failures, which can then be fixed to achieve better performance on projects (e.g., Thomke & Bell, 2001). And it is not just about technology. New products or services must be supported by an adequate business model, for instance, using a set of resources for activities that make the product or service reasonably priced, allowing for scalable, recurring sales and sustained profitability and customer satisfaction (Teece, 2010). In short, Internal-Exploration learning is at the heart of most strategic endeavors today.

We thus found it surprising that no scale in the studies that we reviewed focused on Internal-Exploration learning, especially given that its activities are clear. It seems feasible to develop a scale that adequately captures this form of routine. Indeed, Internal-Exploration learning allows teams to learn based on members' direct experiences of working together on problems through experimentation and trial and error, such as when they develop digital

mock-ups, carry out computer simulations, or build physical prototypes. We urge future research to include this team learning routine. We need to know more about the managerial decisions that affect this form of learning, because it does not come naturally to many teams (Lee et al., 2004). In many organizations, intense demand for quick execution and stellar results may create detrimental conditions to Internal-Exploration learning. Management research can help by providing knowledge that senior managers can use to stimulate this form of learning in parts of the organization, to leverage its benefits.

The second form of team learning missing from the team learning routines reviewed in the literature is External-Balanced learning. Despite its absence, this form of learning clearly takes place in organizations. For instance, the External Innovation unit at BT Group, a British multinational telecommunications holding company, includes a global scouting team tasked with gaining insights into new business models, market opportunities and technologies, in addition to accompanying customer-facing units that generate incremental innovation based on current market needs and customer feedback (Edmondson, Harvey, & Cromwell, 2018). Operating in various cities, this team of experts builds relationships with start-ups and with other large telecommunication firms like Verizon and Bell, as well as with corporations in adjacent sectors, including Google and Netflix, and finally they reach out to well-established companies to understand best practices, such as Walmart's procurement capabilities. Given that it exists in the real world, it could be useful to study this type of team learning routine.

The final form of learning that our review failed to surface is Balanced-Balanced learning. To continue the BT Group example, project teams are sometimes composed of personnel from both an external innovation unit and internal customer-facing units to develop new products and services, and to implement best practices. In such cases, learning is likely to occur both inside and outside the team and to involve exploration and exploitation.

However, this learning is also likely to occur *over time*. Progress in research on team learning will be hampered by overly comprehensive measures of team learning. Covering multiple facets of team learning in one measure was useful, we believe, as the field developed (Edmondson & McManus, 2007), but now team learning research may be best served with more specificity and precision. This can help assess different team learning dynamics, for instance, which we discuss further in the limitations of our model.

Organizations as Multi-Team Learning Systems

Our review sheds light on the missing link between senior managers' decisions and the organization's capabilities. Strategy scholars generally agree that senior managers must leverage knowledge generated by teams to gain and maintain competitive advantage, but they often mention teams only in passing (e.g., Eisenhardt & Martin, 2000; Helfat & Raubitschek, 2000; Stadler, Helfat, & Verona, 2013; Teece et al., 1997). Connecting levels of analysis helps strengthen the dynamic capabilities framework's contribution to our understanding of how organizations achieve long-term performance, and it emphasizes underexplored dynamic managerial capabilities stemming from team and organizational design. Senior managers would gain from developing a holistic understanding of the organization to design teams that adequately direct their learning efforts. Indeed, the knowledge generated by teams carrying out learning routines can support both operational and dynamic capabilities. So different teams should engage in different kinds of learning if organizations are to thrive over time. Some teams must promote strategic foresight and original inquiry, whereas others must facilitate shared understanding and continuous improvement (Edmondson, 2002).

This insight has implications for the growing body of research on multiteam systems (MTSs), that is, systems in which multiple teams pursue different short-term goals but share at least one common long-term goal and thus exhibit interdependence with other teams in the system (Mathieu et al., 2001, p. 290). An organization is a multi-team learning system. For

instance, some teams across an organization may look to gain production efficiency, others may look to excel at customer relations, whereas others may aim to develop ground-breaking technologies or to set sound pricing strategies for products and services. The list of short-term goals is manifold, and these different teams can be more or less interdependent. Yet they all share a common goal: they all work towards making sure the organization achieves long-term performance. The model developed from our review contributes to the view of strategic leadership developed by Finkelstein and colleagues (2009, p. 5), in that it "implies substantive decision-making responsibilities, beyond the interpersonal and relational aspects usually associated with leadership."

However, for a strategic view of team learning to gain traction and have an impact beyond organizational behavior, future team learning research must continue to provide detail about the nature of the teams studied, beyond the outcome measures and how they are operationalized. Ideally, future research would start distinguishing between teams with different types of short-term goals when various teams are examined in a same study. Full data availability, or at least an appendix that includes correlations tables and models for teams with different goals, can help build a strategic view of team learning, facilitating future reviews or meta-analyses.

Developing a strategic view of team learning also places significant demands on future strategy research because it requires a detailed picture of common features and subtle differences across multiple organizations, which make empirical research particularly demanding. For instance, future research could study samples of organizations in which most teams are surveyed about their learning routines to develop learning diversity indices or learning archetypes reflecting the various forms of learning pursued by each organization's teams. It may then be possible to assess the influence of design factors on which senior managers made decisions in the organizations or to predict long-term organizational

performance, and make significant contributions. This is a goal for strategy and team learning researchers, promising to further develop a strategic view of team learning.

Limitations

As noted earlier, the concept of team learning is an umbrella term for many related concepts (Argote, 1999). To ensure that we advance our understanding, researchers need to be precise about definitions and approaches. For the purposes of this article, we focus on processes related to team learning, which we termed team learning routines. Others have conceptualized team learning as an outcome or as task mastery (see the review by Edmondson et al., 2007). It is important to bear this boundary condition in mind when interpreting the our review's findings.

We focus on managerial decisions, or design factors, in association with team learning. However, there are emergent states or climate factors that can directly influence how learning occurs across an organization. For instance, future research could look at the role of senior managers in shaping a robust holding environment (Petriglieri & Petriglieri, 2018), characterized by psychological safety, where teams can resolve challenging dilemmas and disagreements. Nurturing the learning climate of teams involves more than just making design decisions (see Harvey, Leblanc, and Cronin, 2019). Senior managers' capacity to create a robust holding environment where team learning can emerge is an important direction for future research.

Also, in this review, we do not fully account for the role of the external context (Malone et al., 2016). For example, seminal work in the strategy literature points to two dimensions of newness—technology and market—that have critical implications for how to approach the innovation process (Abernathy & Clark, 1985). These authors argued that an inability to identify where a project is positioned in relation to these dimensions, and to analyze the organizational and competitive implications of this position, was an important

cause of project failure. Suppose the technology associated with an innovation is characterized by a high degree of newness. In that case, it is likely to not fit within the established operations, requiring an investment in new systems and knowledge to support the new technology. Similarly, if market newness is high, then the innovation is likely to disrupt linkages to existing markets, and customer needs may not be well understood, such that investments must be made in building new customer relationships. Such external contextual factors will necessarily matter for team learning and are an important focus of future research. To be precise and practical, team learning research requires theory that identifies a typology of essential team learning routines comprehensively and formulates testable propositions about how these routines affect outcomes that fit the specific task context.

Finally, our model reflects the static, cross-sectional nature of the studies that we reviewed. A lot has been said about the need to include dynamics in team research (e.g., Cronin et al., 2011) and team learning in particular (Argote et al., 2020). At the individual level, learning involves both action (trying new things) and reflection (thinking about new things) in dynamic, often alternating, phases. While a team that only acts will not learn, there is a risk that a team that only reflects creates merely the illusion of learning (members incorrectly think they learn because they equate learning to reflection). But that illusion will be punctured eventually, as no progress occurs. It is in the back and forth between action and reflection that team learning, and through it, organizational learning occurs (Edmondson, 2002). Our review, especially in its coverage of the balanced forms of learning, suggests an analogous insight about both exploiting and exploring, and staying within and going outside the team to learn. This perspective is consistent with March's original (1991) thinking about organizational learning, in which he described the ease of failing to balance exploitation with exploration, and with Argyris' work (1977) on the need for a balance of advocacy with inquiry, for managers to learn and better shape organizational strategy in a changing world.

However, the balanced forms of learning have seldom been studied with longitudinal methods (i.e., latent change score or latent growth modelling) and the dynamic nature of team learning has therefore not been fully captured. Indeed, studies rarely include more than one kind of team learning routine. Findings from studies that do include multiple kinds of team learning at times suggest that different forms of learning are complements (e.g., Bresman, 2010; Jansen, Kostopoulos, Michalache, & Papalexandris, 2016; Kostopoulos & Bozionelos, 2011) and at times that they are substitutes (Wong, 2004). These seemingly contradictory findings are, at least in part, explained by the measures and context of the specific studies. For example, Wong's (2004) study focuses on team efficiency in a relatively stable setting whereas Bresman's study (2010) takes a broader view of performance in an unambiguously innovation-driven setting. In particular, longitudinal approaches promise to increase our understanding of how different team learning routines interact in different settings and, perhaps more importantly, identify the ideal sequencing or growth potential of different forms of team learning. Much more research is needed to further our understanding of learning over time in teams.

CONCLUSION

The purpose of this review was to examine the bridging role of team learning between senior managers' decisions and organizational capabilities, using the dynamic capabilities framework as a conceptual springboard (Teece et al., 1997). The model that emerged includes connections between six distinct team learning routines and the development of organizational capabilities. Furthermore, it identifies a set of design levers related to structure, composition, and task that senior managers can use to shape team learning routines for strategic outcomes. While the role of team learning in building organizational capabilities has been noted by scholars, how senior managers can shape team learning routines is a question that has been overlooked. We believe that complementing the manager-focused

analysis of microfoundations in strategy with a team-based approach helps extend our understanding of capabilities as they unfold to support the superior performance of organizations. Attention to the role of team learning routines as a link between managerial capabilities and strategic outcomes should help build the foundation for a strategic view of team learning, opening up important paths for future research in the fields of strategic management and organizational behavior.

REFERENCES

Abernathy, W. J., & Clark, K. B. 1985. Innovation: Mapping the winds of creative destruction. ***Research Policy***, 14: 3-22.

Abrantes, A. C. M., Passos, A. M., Cunha, M. P. e., & Santos, C. M. 2018. Bringing team improvisation to team adaptation: The combined role of shared temporal cognitions and team learning behaviors fostering team performance. ***Journal of Business Research***, 84: 59-71.

Adner, R., & Helfat, C. E. 2003. Corporate Effects And Dynamic Managerial Capabilities. ***Strategic Management Journal***, 24(10): 1011-1025.

Allen, T. J. 1977. ***Managing the flow of technology: Technology transfer and the dissemination of technological information within the R&D organization***. Cambridge, MA: MIT Press.

Allen, T. J., & Cohen, S. I. 1969. Information flows in research and development laboratories. ***Administrative Science Quarterly***, 14: 12-19.

Ancona, D. G., & Caldwell, D. F. 1992. Bridging the boundary: External activity and performance in organizational teams. ***Administrative Science Quarterly***, 37: 634-665.

Ancona, D. G., & Caldwell, D. F. 1998. Rethinking team composition from the outside in. In D. H. Gruenfeld (Ed.), ***Research on Managing Groups and Teams***, Vol. 1. Stamford, CT: JAI Press.

Argote, L. 1999. ***Organizational learning: Creating, retaining and transferring knowledge***. Kluwer Academic Publishers.

Argote, L., & Levine, J. M. 2020. ***The Oxford Handbook of Group and Organizational Learning***. Oxford University Press.

Argote, L., & Miron-Spektor, E. 2011. Organizational Learning: From Experience to Knowledge. ***Organization Science***, 22(5): 1123-1137.

Argote, L., & Ren, Y. 2012. Transactive Memory Systems: A Microfoundation of Dynamic Capabilities. ***Journal of Management Studies***, 49:8: 1375-1382.

Argyris, C. 1977. Double loop learning in organizations. ***Harvard Business Review***, 55(5), 115-125.

Aubé, C., Francoeur, C., Sponem, S., & Séguin, M. 2021. Ethical leadership and corporate board effectiveness: The role of team reflexivity and environmental dynamism. ***Group Dynamics: Theory, Research, and Practice***.

Beekun, R. I. 1989. Assessing the Effectiveness of Sociotechnical Interventions: Antidote or Fad? ***Human Relations***, 42(10): 877-897.

Bell, S. T., Brown, S. G., Colaneri, A., & Outland, N. 2018. Team composition and the ABCs of teamwork. ***American Psychologist***, 73(4): 349–362.

Bingham, C. B., Heimeriks, K. H., Schijven, M., & Gates, S. 2015. Concurrent Learning: How Firms Develop. Multiple Dynamic Capabilities In Parallel. ***Strategic Management Journal***, 36: 1802-1825.

Bresman, H. 2010. External Learning Activities and Team Performance: A Multimethod Field Study. ***Organization Science***, 21(1): 81-96.

Bresman, H., & Zellmer-Bruhn, M. 2012. The Structural Context of Team Learning: Effects of Organizational and Team Structure on Internal and External Learning. ***Organization Science***, 24(4): 1120-1139.

Brion, S., Chauvet, V., Chollet, B., & Mothe, C. 2012. Project leaders as boundary spanners: Relational antecedents and performance outcomes. ***International Journal of Project Management***, 30(6), 708-722.

Brown, S. L., & Eisenhardt, K. M. 1995. Product development: Past research, present findings and future directions. ***Academy of Management Review***, 20(2): 343-378.

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: 1-34.

Brown, T. 2008. Design thinking. ***Harvard Business Review***, 86(6).

Brueller, D., & Carmeli, A. 2011. Linking capacities of high-quality relationships to team learning and performance in service organizations. ***Human Resource Management***, 50(4): 455-477.

Brykman, K. M., & King, D. D. 2021. A resource model of team resilience capacity and learning. ***Group & Organization Management***.

Buck, V. E. 1966. A model for viewing an organization as a system of constraints. In J. D. Thompson (Ed.), ***Approaches to Organizational Design***: 103-172: University of Pittsburgh Press.

Bunderson, J. S., & Boumgarden, P. 2010. Structure and Learning in Self-Managed Teams: Why "Bureaucratic" Teams Can Be Better Learners. ***Organization Science***, 21(3): 609-624.

Bunderson, J. S., & Reagans, R. E. 2011. Power, Status, and Learning in Organizations. ***Organization Science***, 22(5): 1182-1194.

Campion, M. A., Medsker, G. J., & Higgs, A. C. 1993. Relations between work group characteristics and effectiveness: Implications for designing effective work groups. ***Personnel Psychology***, 46: 821-850.

Carbonell, P., & Escudero, A. I. R. 2018. The Dark Side of Team Social Cohesion in NPD Team Boundary Spanning. ***Journal of Product Innovation Management***, 36(2): 149-171.

Carmeli, A., Tishler, A., & Edmondson, A. C. 2012. CEO relational leadership and strategic decision quality in top management teams: The role of team trust and learning from failure. ***Strategic Organization***, 10(1): 31-54.

Carmeli, A., Levi, A., & Peccei, R. 2021. Resilience and creative problem-solving capacities in project teams: A relational view. ***International Journal of Project Management***, 39: 546-556.

Carter, S. M., & West, M. A. 1998. Reflexivity, Effectiveness and Mental Health in BBC-TV Production Teams. ***Small Group Research***, 29(5): 583-601.

Chan, K.-Y., Oerlemans, L., & Meslec, N. 2021. The impact of multiple project team membership on individual and team learning: A micro-meso multi-level empirical study. ***International Journal of Project Management***, 39(3): 308-320.

Cheung, S. Y., Gong, Y., Wang, M., Zhou, L. B., & Shi, J. 2016. When and how does functional diversity influence team innovation? The mediating role of knowledge

sharing and the moderation role of affect-based trust in a team. ***Human Relations***, 69(7): 1507-1531.
Chi, N. W., & Lam, L. W. 2021. Is negative group affective tone always bad for team creativity? Team trait learning goal orientation as the boundary condition. ***Group & Organization Management***.
Choi, S. Y., Lee, H., & Yoo, Y. 2010. The Impact of Information Technology and Transactive Memory Systems on Knowledge Sharing, Application, and Team Performance: A Field Study. ***MIS Quarterly***, 34(4): 855-870.
Chuang, C.-H., Jackson, S. E., & Jiang, Y. 2013. Can Knowledge-Intensive Teamwork Be Managed? Examining the Roles of HRM Systems, Leadership, and Tacit Knowledge. ***Journal of Management***, 42(2): 524-554.
Chun, J. S., & Choi, J. N. 2014. Members' needs, intragroup conflict, and group performance. ***Journal of Applied Psychology***, 99(3).
Cohen, M. D., Burkhart, R., Dosi, G., Egidi, M., Marengo, L., Warglien, M., & Winter, S. G. 1996. Routines and other recurring action patterns of organizations: Contemporary research issues. ***Industrial and Corporate Change***, 5(3): 653-698.
Cohen, S. G., & Bailey, D. E. 1997. What makes teams work: Group effectiveness research from the shop floor to the executive suite. ***Journal of Management***, 23(3): 239-290.
Cohen, S. G., & Ledford, G. E. 1994. The effectiveness of self-managing teams: A quasi-experiment. ***Human Relations***, 47: 13-43.
Cooke, N. J., Salas, E., Cannon-Bowers, J. A., & Stout, R. J. 2000. Measuring Team Knowledge. ***Human Factors***, 42(1): 151-173.
Darr, E. D., Argote, L., & Epple, D. 1995. The acquisition, transfer, and depreciation of knowledge in service organizations: Productivity in franchises. ***Management Science***, 41(11): 1750-1762.
Davis, J. P., Eisenhardt, K. M., & Bingham, C. B. 2009. Optimal structure, market dynamism, and the strategy of simple rules. ***Administrative Science Quarterly***, 54: 413-452.
De Dreu, C. K. W. 2007. Cooperative outcome interdependence, task reflexivity, and team effectiveness: A motivated information processing perspective. ***Journal of Applied Psychology***, 92(3): 628–638.
Delbridge, R., & Fiss, P. C. 2013. Editors' Comments: Styles of Theorizing and the Social Organization of Knowledge. Academy of Management Review, 38(3): 325-331.
Dimas, I. D., Lourenço, P. R., Rebelo, T., & Rocha, H. 2021. Maximizing learning through cohesion: Contributions from a nonlinear approach. ***Small Group Research***, 52(2), 162-188.
Dong, Y., Bartol, K. M., Zhang, Z.-X., & Li, C. 2017. Enhancing employee creativity via individual skill development and team knowledge sharing: Influences of dual-focused transformational leadership. ***Journal of Organizational Behavior***, 38(3): 439-458.
Dosi, G., Nelson, R. R., & Winter, S. G. 2000. The nature and dynamics of organizational capabilities. In G. Dosi, R. R. Nelson, & S. G. Winter (Eds.), ***The nature and dynamics of organizational capabilities***: 1-24. Oxford: Oxford University Press.
Doty, D. H., & Glick, W. H. 1994. Typologies As a Unique Form Of Theory Building: Toward Improved Understanding and Modeling. ***Academy of Management Review***, 19(2).
Drach-Zahavy, A. 2011. Interorganizational teams as boundary spanners: The role of team diversity, boundedness, and extrateam links. ***European Journal of Work and Organizational Psychology***, 20(1): 89-118.
Edmondson, A. C. 1999. Psychological safety and learning behavior in work teams. ***Administrative Science Quarterly***, 44: 350-383.

Edmondson, A. C. 2002. The local and variegated nature of learning in organizations: A group-level perspective. ***Organization Science***, 13(2): 128-146.
Edmondson, A. C. 2012. ***Teaming: How Organizations Learn, Innovate, and Compete in the Knowledge Economy***. John Wiley & Sons.
Edmondson, A. C., Dillon, J. R., & Roloff, K. S. 2007. Three perspecives on team learning: Outcome improvement, task mastery, and group process. In J. P. Walsh, & A. P. Brief (Eds.), ***Academy of Management Annals***: 269-314. New York: Routledge.
Edmondson, A. C., & Harvey, J.-F. 2016. Open innovation at Fujitsu (A). ***Harvard Business School Case*** 616-034.
Edmondson, A. C., & Harvey, J.-F., Cromwell, J. R. 2018. Leading Open innovation at BT. ***Harvard Business School Case*** 619-013.
Edmondson, A. C., & Harvey, J.-F. 2017. ***Extreme Teaming: Lessons in Complex, Cross-Sector Leadership***. Emerald Publishing Limited.
Edmondson, A. C., & Harvey, J.-F. 2018. Cross-boundary teaming for innovation: Integrating research on teams and knowledge in organizations. ***Human Resource Management Review***, 28(4): 347-360.
Edmondson, A. C., & McManus, S. E. 2007. Methodological fit in management field research. ***Academy of Management Review***, 32(4): 1246-1264.
Edmondson, A. C., Winslow, A. B., Bohmer, R. M., & Pisano, G. P. 2003. Learning how and learning what: Effects of tacit and codified knowledge on performance improvement following technology adoption. ***Decision Sciences***, 34(2): 197-223.
Eisenberg, J., Post, C., & DiTomaso, N. 2019. Team Dispersion and Performance: The Role of Team Communication and Transformational Leadership. ***Small Group Research***, 50(3): 348-380.
Eisenhardt, K. M., & Martin, J. A. 2000. Dynamic Capabilities: What Are They? ***Strategic Management Journal***, 21(10/11): 1105-1121.
Epple, D., Argote, L., & Devadas, R. 1991. Organizational learning curves: A method for investigating intra-plant transfer of knowledge acquired through learning by doing. ***Organization Science***, 2: 558-570.
Epple, D., Argote, L., & Murphy, K. 1996. An empirical investigation of the micro structure of knowledge acquisition and transfer through learning by doing. ***Operations Research***, 44(1): 77-86.
Faraj, S., & Sproull, L. S. 2000. Coordinating expertise in software development teams. ***Management Science***, 46(12): 1554-1568.
Feldman, M. S. 2000. Organizational Routines as a Source of Continuous Change. ***Organization Science***, 11(6): 611-629.
Finkelstein, S., Hambrick, D. C., & Cannella, A. A. 2009. ***Strategic Leadership: Theory and Research on Executives, Top Management Teams, and Boards***. New York, NY: Oxford University Press.
Friedrich, A. L., Sjöberg, A., & Friedrich, P. 2016. Leaned teamwork fattens workplace innovation: the relationship between task complexity, team learning and team proactivity. ***European Journal of Work and Organizational Psychology***, 25(4): 561-569.
Fu, N., Flood, P. C., Rousseau, D. M., & Morris, T. 2021. Resolving the individual helping and objective job performance dilemma: The moderating effect of team reflexivity. ***Journal of Business Research***, 129, 236-243.
Gebert, D., Boerner, S., & Kearney, E. 2010. Fostering team innovation: Why is it important to combine opposing action strategies? ***Organization Science***, 21(3): 593-608.
Gersick, C. J. G., & Hackman, J. R. 1990. Habitual routines in task-performing groups. ***Organizational Behavior and Human Decision Processes***, 47: 65-97.

Gibson, C. B., & Dibble, R. 2013. Excess May Do Harm: Investigating the Effect of Team External Environment on External Activities in Teams. ***Organization Science***, 24(3): 697-715.

Gibson, C. B., Dunlop, P. D., & Cordery, J. L. 2019. Managing formalization to increase global team effectiveness and meaningfulness of work in multinational organizations. ***Journal of International Business Studies***: 1021–1052.

Gilson, L. L., Lim, H. S., Luciano, M. M., & Choi, J. N. 2013. Unpacking the cross-level effects of tenure diversity, explicit knowledge, and knowledge sharing on individual creativity. ***Journal of Occupational and Organizational Psychology***, 86(2), 203-222.

Gladwell, M. 2011. Creation myth: Xerox, PARC, Apple, and the truth about innovation., ***The New Yorker***, Vol. 87.

Gong, Y., Kim, T.-Y., Lee, D.-R., & Zhu, J. 2013. A Multilevel Model of Team Goal Orientation, Information Exchange, and Creativity. ***Academy of Management Journal***, 56(3).

Gopal, A., & Gosain, S. 2010. Research Note—The Role of Organizational Controls and Boundary Spanning in Software Development Outsourcing: Implications for Project Performance. ***Information Systems Research***, 21(4): 960-982.

Grant, R. M. 1996. Prospering in dynamically-competitive environments: Organizational capability as knowledge integration. ***Organization Science***, 7(4): 375-387.

Greer, Homan, Hoogh, D., & Hartog, D. 2012. Tainted visions: The effect of visionary leader behaviors and leader categorization tendencies on the financial performance of ethnically diverse teams. ***Journal of Applied Psychology***, 97(1): 203–213.

Haas, M. R. 2010. The double-edged sword of autonomy and external knowledge: Analyzing team effectiveness in a multinational organization. ***Academy of Management Journal***, 53(5): 989-1008.

Haas, M. R., & Cummings, J. N. 2015. Barriers to knowledge seeking within MNC teams: Which differences matter most? ***Journal of International Business Studies***: 36–62.

Hackman, J. R., & Morris, C. G. 1975. Group Tasks, Group Interaction Process, and Group Performance Effectiveness: A Review and Proposed Integration. ***Advances in Experimental Social Psychology***, 8: 45-99.

Harrison, D. A., & Klein, K. J. 2007. What's the difference? Diversity constructs as separation, variety, or disparity in organizations. ***Academy of Management Review***, 32(4).

Hartmann, S., Weiss, M., Hoegl, M., & Carmeli, A. 2021. How does an emotional culture of joy cultivate team resilience? A sociocognitive perspective. ***Journal of Organizational Behavior***, 42(3): 313-331.

Harvey, S. 2015. When accuracy isn't everything: The value of demographic differences to information elaboration in teams. ***Group & Organization Management***, 40(1): 35-61.

Harvey, J. F., Johnson, K. J., Roloff, K. S., & Edmondson, A. C. 2019. From orientation to behavior: The interplay between learning orientation, open-mindedness, and psychological safety in team learning. ***Human Relations***, 72(11): 1726-1751.

Helfat, C., & Martin, J. 2015. Dynamic Managerial Capabilities: Review and Assessment of Managerial Impact on Strategic Change. ***Journal of Management***, 41(5): 1281-1312.

Helfat, C., & Peteraf, M. 2015. Managerial cognitive capabilities and the microfoundations of dynamic capabilities. ***Strategic Management Journal***, 36(6): 831-850.

Helfat, C. E., & Campo-Rembado, M. A. 2016. Integrative Capabilities, Vertical Integration, and Innovation Over Successive Technology Lifecycles. ***Organization Science***, 27(2): 249-264.

Helfat, C. E., Finkelstein, S., Mitchell, W., Peteraf, M., Singh, H., Teece, D., & Winter, S. G. 2009. ***Dynamic capabilities: Understanding strategic change in organizations***. Blackwell.

Helfat, C. E., & Raubitschek, R. S. 2000. Product sequencing: co-evolution of knowledge, capabilities and products. ***Strategic Management Journal***(21): 961–979.

Helfat, C. E., & Winter, S. G. 2011. Untangling Dynamic and Operational Capabilities: Strategy for the (N)ever-Changing World. ***Strategic Management Journal***, 32(11): 1243-1250.

Helfat, C. E., Finkelstein, S., Mitchell, W., Peteraf, M., Singh, H., Teece, D., & Winter, S. G. (2009). ***Dynamic Capabilities: Understanding Strategic Change in Organizations***. John Wiley & Sons.

Hirst, G. 2009. Effects of membership change on open discussion and team performance: The moderating role of team tenure. ***European Journal of Work and Organizational Psychology***, 18(2): 231-249.

Hirst, G., Knippenberg, D. V., & Zhou, J. 2009. A Cross-Level Perspective on Employee Creativity: Goal Orientation, Team Learning Behavior, and Individual Creativity. ***Academy of Management Journal***, 52(2).

Hodgkinson, G. P., & Healey, M. P. 2011. Psychological foundations of dynamic capabilities: Reflexion and reflection in strategic management. ***Strategic Management Journal***, 32(13): 1500-1516.

Hoogeboom, M. A., & Wilderom, C. P. 2020. A Complex Adaptive Systems Approach to Real-Life Team Interaction Patterns, Task Context, Information Sharing, and Effectiveness. ***Group & Organization Management***, 45(1): 3-42.

Hu, J., Erdogan, B., Jiang, K., Bauer, T. N., & Liu, S. 2018. Leader humility and team creativity: The role of team information sharing, psychological safety, and power distance. ***Journal of Applied Psychology***, 103(3): 313–323.

Hu, L., & Randel, A. E. 2014. Knowledge Sharing in Teams: Social Capital, Extrinsic Incentives, and Team Innovation. ***Group & Organization Management***, 39(2): 213-243.

Huang, C. C. 2009. Knowledge sharing and group cohesiveness on performance: An empirical study of technology R&D teams in Taiwan. ***Technovation***, 29(11): 786-797.

Huang, X., Hsieh, J. P.-A., & He, W. 2014. Expertise dissimilarity and creativity: The contingent roles of tacit and explicit knowledge sharing. ***Journal of Applied Psychology***, 99(5): 816–830.

Huang, C. Y., & Liu, Y. C. 2021. Influence of need for cognition and psychological safety climate on information elaboration and team creativity. ***European Journal of Work and Organizational Psychology***.

Huang, L. C., Liu, Y., Cheung, G. W. H., & Sun, J. M. 2021. A multilevel study of group affective tone and team innovation: A moderated mediation model. ***Group & Organization Management***.

Hülsheger, U. R., Anderson, N., & Salgado, J. F. 2009. Team-level predictors of innovation at work: a comprehensive meta-analysis spanning three decades of research. ***Journal of Applied Psychology***, 94(5): 1128–1145.

Imam, H., & Zaheer, M. K. 2021. Shared leadership and project success: The roles of knowledge sharing, cohesion and trust in the team. ***International Journal of Project Management***, 39: 463-473.

Ingram, P., & Simons, T. 2002. The transfer of experience in groups of organizations: Implications for performance and competition. ***Management Science***, 48(12): 1517-1533.

Jansen, J. J., Kostopoulos, K. C., Mihalache, O. R., & Papalexandris, A. 2016. A socio-psychological perspective on team ambidexterity: The contingency role of supportive leadership behaviours. ***Journal of Management Studies***, 53(6), 939-965.

Jiang, Y., & Chen, C. C. 2016. Integrating knowledge activities for team innovation: Effects of transformational leadership. ***Journal of Management***, 44(5): 1819-1847.

John A. Pearce, I., & Ravlin, E. C. 1987. The Design and Activation of Self-Regulating Work Groups. ***Human Relations***, 40(11): 751-782.

Jong, B. A. d., & Elfring, T. 2010. How Does Trust Affect the Performance of Ongoing Teams? The Mediating Role of Reflexivity, Monitoring, and Effort. ***Academy of Management Journal***, 53(3).

Katz, R. 1982. The effects of group longevity on project communication and performance. ***Administrative Science Quarterly***, 27: 81-104.

Kearney, E., Gebert, D., & Voelpel, S. C. 2009. When And How Diversity Benefits Teams: The Importance Of Team Members' Need For Cognition. ***Academy of Management Journal***, 52(3).

Kerrissey, M., Satterstrom, P., & DiBenigno, J. 2020a. The Voice Cultivation Process: How Team Members Can Help Upward Voice Live on to Implementation. ***Administrative Science Quarterly***: 1-46.

Kerrissey, M. J., Satterstrom, P., & Edmondson, A. C. 2020b. Into the fray: Adaptive approaches to studying novel teamwork forms. ***Organizational Psychology Review***, 10(2): 62-86.

Knippenberg, D. v., & Schippers, M. C. 2007. Work Group Diversity. ***Annual Review of Psychology***, 58: 515-541.

Kor, Y. Y., & Mesko, A. 2013. Dynamic Managerial Capabilities: Configuration and Orchestration of the Top Executives' Capabilities and the Firm's Dominant Logic. ***Strategic Management Journal***, 34(2): 233-244.

Kostopoulos, K. C., & Bozionelos, N. 2011. Team Exploratory and Exploitative Learning: Psychological Safety, Task Conflict, and Team Performance. ***Group & Organization Management***, 36(3): 385-415.

Kostopoulos, K. C., Spanos, Y. E., & Prastacos, G. P. 2011. Structure and Function of Team Learning Emergence: A Multilevel Empirical Validation. ***Journal of Management***, 39(6): 1430-1461.

Kozlowski, S. W. J., & Klein, K. J. 2000. A multilevel approach to theory and research in organizations: Contextual, temporal and emergent processes. In S. W. J. Kozlowski, & K. J. Klein (Eds.), ***Multilevel theory, research, and methods in organizations: Foundations, extensions and new directions***: 3-90. San Francisco, CA: Jossey Bass.

Lee, F., Edmondson, A. C., Thomke, S., Worline, M. 2004. The mixed effects of inconsistency on experimentation in organizations. ***Organization Science*** 15(3): 310-326.

Leroy, H., Hoever, I. J., Vangronsvelt, K., & Van den Broeck, A. 2020. How team averages in authentic living and perspective-taking personalities relate to team information elaboration and team performance. ***Journal of Applied Psychology***, 106(3): 364–376.

Lewis, K. 2004. Knowledge and performance in knowledge-worker teams: A longitudinal study of transactive memory systems. ***Management Science***, 50: 1519-1533.

Li, C. R., Lin, C. J., & Liu, J. 2019. The role of team regulatory focus and team learning in team radical and incremental creativity. ***Group & Organization Management***, 44(6): 1036-1066.

Liang, D. W., Moreland, R. L., & Argote, L. 1995. Group versus individual training and group performance. ***Personality and Social Psychology Bulletin***, 21(4): 384-393.

Liang, J., Shu, R., & Farh, C. I. C. 2018. Differential implications of team member promotive and prohibitive voice on innovation performance in research and development project teams: A dialectic perspective. ***Journal of Organizational Behavior***, 40(1): 91-104.

Litchfield, R. C., Karakitapoğlu-Aygün, Z., Gumusluoglu, L., Carter, M., & Hirst, G. 2018. When Team Identity Helps Innovation and When It Hurts: Team Identity and Its Relationship to Team and Cross-Team Innovative Behavior. ***Journal of Product Innovation Management***, 35(3): 350-366.

Lu, L., Li, F., Leung, K., Savani, K., & Morris, M. W. 2017. When can culturally diverse teams be more creative? The role of leaders' benevolent paternalism. ***Journal of Organizational Behavior***, 39(4): 402-415.

Luciano, M. M., Nahrgang, J. D., & Shropshire, C. 2020. Strategic leadership systems: Viewing top management teams and boards of directors from a multiteam systems perspective. ***Academy of Management Review***, 45(3): 675-701.

Madrid, H. P., Totterdell, P., Niven, K., & Barros, E. 2016. Leader affective presence and innovation in teams. ***Journal of Applied Psychology***, 101(5): 673–686.

Magni, M., & Maruping, L. M. 2013. Sink or Swim: Empowering Leadership and Overload in Teams' Ability to Deal with the Unexpected. ***Human Resource Management***, 52(5): 715-739.

Magni, M., Maruping, L. M., Hoegl, M., & Proserpio, L. 2013. Managing the Unexpected Across Space: Improvisation, Dispersion, and Performance in NPD Teams. ***Journal of Product Innovation Management***, 30(5): 1009-1026.

Maloney, M. M., Bresman, H., Zellmer-Bruhn, M. E., & Beaver, G. R. 2016. Contextualization and Context Theorizing in Teams Research. ***Academy of Management Annals***, 10(1), 891-942.

Manz, C. C., & Stewart, G. L. 1997. Attaining Flexible Stability by Integrating Total Quality Management and Socio-Technical Systems Theory. ***Organization Science***, 8(1): 59-70.

March, J. G. 1991. Exploration and exploitation in organizational learning. ***Organization Science***, 2(1): 71-87.

Marks, M. A., Mathieu, J. E., & Zaccaro, S. J. 2001. A Temporally Based Framework and Taxonomy Of Team Processes. ***Academy of Management Review***, 26(3): 356-376.

Marrone, J. A., Tesluk, P. E., & Carson, J. B. 2007. A multilevel investigation of antecedents and consequences of team member boundary-spanning behavior. ***Academy of Management Journal***, 50(6): 1423-1439.

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.

Mathieu, J., Maynard, M. T., Rapp, T., & Gilson, L. 2008. Team effectiveness 1997-2007: A review of recent advancements and a glimpse into the future. ***Journal of Management***, 34(3): 410-476.

Mathieu, J. E., Tannenbaum, S. I., Donsbach, J. S., & Alliger, G. M. 2014. A review and integration of team composition models: Moving toward a dynamic and temporal framework. ***Journal of Management***, 40(1): 130-160.

Maynard, M. T., Mathieu, J. E., Gilson, L. L., Sanchez, D. R., & Dean, M. D. 2019. Do I Really Know You and Does It Matter? Unpacking the Relationship Between Familiarity and Information Elaboration in Global Virtual Teams. ***Group & Organization Management***, 44(1): 3-37.

McGrath, J. E. 1964. ***Social psychology: A brief introduction***. Holt, Rinehart, & Winston.

Mehta, N., & Bharadwaj, A. 2015. Knowledge integration in outsourced software development: The role of sentry and guard processes. ***Journal of Management Information Systems***, 32(1): 82-115.
Montanari, J. R. 1979. Strategic choice: A theoretical analysis. Jou***rnal of Management Studies***, 16(2): 202-221.
Mortensen, M., & Haas, M. R. 2018. Perspective—Rethinking Teams: From Bounded Membership to Dynamic Participation. ***Organization Science***, 29(2): 191-355.
Nelson, R. R., & Winter, S. G. 1982. ***An Evolutionary Theory of Economic Change***. Cambridge, MA: The Belknap Press of Harvard University Press.
Neuendorf, K. A. 2002. ***The content analysis guidebook***: Sage.
O'Neill, T. A., Allen, N. J., & Hastings, S. E. 2013. Examining the "pros" and "cons" of team con flict: A team-level meta-analysis of task, relationship, and process conflict. ***Human Performance***, 26(3): 236-260.
Park, J. G., & Lee, J. 2014. Knowledge sharing in information systems development projects: Explicating the role of dependence and trust. ***International Journal of Project Management***, 32(1): 153-165.
Parker, H., & du Plooy, E. 2021. Team-based games: Catalysts for developing psychological safety, learning and performance. ***Journal of Business Research***, 125: 45-51.
Penrose, E. T. 1959. ***The Theory of the Growth of the Firm***. Oxford: Basil Blackwell.
Petriglieri, G., & Petriglieri, J. L. 2018. The return of the oppressed: A systems psychodynamic approach to organization studies. ***Academy of Management Annals***, 14(1): 411-449.
Pisano, G., & Shulman, J. 2018. Flying into the Future: Honda Aircraft Corporation. ***Harvard Business School Case*** 618-012
Pisano, G. P. 1994. Knowledge, Integration, and the Locus of Learning: An Empirical Analysis of Process Development. ***Strategic Management Journal***, 15(S1): 85-100.
Pisano, G. P. 2017. Toward a prescriptive theory of dynamic capabilities: connecting strategic choice, learning, and competition. ***Industrial and Corporate Change***, 26(5): 747–762.
Pisano, G. P. 2019. ***Creative construction: The DNA of sustained innovation***. PublicAffairs.
Popaitoon, S., & Siengthai, S. 2014. The moderating effect of human resource management practices on the relationship between knowledge absorptive capacity and project performance in project-oriented companies. ***International Journal of Project Management***, 32(6): 908-920.
Rapp, T. L., Bachrach, D. G., Rapp, A. A., & Mullins, R. 2014. The role of team goal monitoring in the curvilinear relationship between team efficacy and team performance. ***Journal of Applied Psychology***, 99(5): 976.
Reiter-Palmon, R., Kennel, V., Allen, J., & Jones, K. J. 2018. Good catch! using interdisciplinary teams and team reflexivity to improve patient safety. ***Group & Organization Management***, 43(3): 414-439.
Ries, E. 2011. ***The lean startup: How today's entrepreneurs use continuous innovation to create radically successful businesses***. Crown Business.
Romanow, D., Rai, A., & Keil, M. 2018. CPOE-enabled coordination: Appropriation for deep structure use and impacts on patient outcomes. ***MIS Quarterly***, 42(1): 189-212.
Savelsbergh, C., Gevers, J. M. P., Heijden, B. I. J. M. v. d., & Poell, R. F. 2012. Team Role Stress: Relationships With Team Learning and Performance in Project Teams. ***Group & Organization Management***, 37(1): 67-100.
Savelsbergh, C. M. J. H., Heijden, B. I. J. M. v. d., & Poell, R. F. 2009. The Development and Empirical Validation of a Multidimensional Measurement Instrument for Team Learning Behaviors. ***Small Group Research***, 40(5): 578-607.

Savelsbergh, C. M. J. H., Poell, R. F., & Heijden, B. I. J. M. V. d. 2015. Does team stability mediate the relationship between leadership and team learning? An empirical study among Dutch project teams. ***International Journal of Project Management***, 33(2): 406-418.

Schaubroeck, J., Carmeli, A., Bhatia, S., & Paz, E. 2016. Enabling team learning when members are prone to contentious communication: The role of team leader coaching. ***Human Relations***, 69(8): 1709-1727.

Schilke, O., Hu, S., & Helfat, C. E. 2018. Quo Vadis, Dynamic Capabilities? A Content-Analytic Review of the Current State of Knowledge and Recommendations for Future Research. ***Academy of Management Annals***, 12(1): 390-439.

Schippers, M. C., Hartog, D. N. D., Koopman, P. L., & Van Knippenberg, D. 2008. The role of transformational leadership in enhancing team reflexivity. ***Human Relations***, 61(11): 1593-1616.

Schippers, M. C., West, M. A., & Dawson, J. F. 2012. Team reflexivity and innovation: The moderating role of team context. ***Journal of Management***, 41(3): 769-788.

Schippers, M., Edmondson, A.C. & West, M.A. 2014. Team reflexivity as an antidote to team information processing failures. ***Small Group Research***, 45(6): 731-769

Schmutz, J. B., Lei, Z., Eppich, W. J., & Manser, T. 2018. Reflection in the heat of the moment: The role of in-action team reflexivity in health care emergency teams. ***Journal of Organizational Behavior***, 39(6): 749-765.

Shemla, M., Kearney, E., Wegge, J., & Stegmann, S. 2020. Unlocking the performance potential of functionally diverse teams: The paradoxical role of leader mood. ***Journal of Occupational and Organizational Psychology***, 93(3): 530-555.

Shemla, M., & Wegge, J. 2019. Managing diverse teams by enhancing team identification: The mediating role of perceived diversity. ***Human Relations***, 72(4): 755-777.

Shin, Y. 2014. Positive group affect and team creativity: Mediation of team reflexivity and promotion focus. ***Small Group Research***, 45(3): 337-364.

Shuffler, M. L., & Cronin, M. A. 2021. The challenges of working with "real" teams: Challenges, needs, and opportunities. ***Organizational Psychology Review***, 9(4): 211-218.

Spreitzer, G. M. 1995. Psychological Empowerment in the Workplace: Dimensions, Measurement, and Validation. ***Academy of Management Journal***, 38(5): 1442-1465.

Stadler, C., Helfat, C. E., & Verona, G. 2013. The Impact of Dynamic Capabilities on Resource Access and Development. ***Organization Science***, 24(6): 1782-1804.

Stephens, J. P., & Carmeli, A. 2016. The positive effect of expressing negative emotions on knowledge creation capability and performance of project teams. ***International Journal of Project Management***, 34(5): 862-873.

Stewart, G. L. 2006. A meta-analytic review of relationships between team design features and team performance. ***Journal of Management***, 32(1): 29-55.

Stewart, G. L., & Barrick, M. R. 2000. Team structure and performance: Assessing the mediating role of intrateam process and the moderating role of task type. ***Academy of Management Journal***, 43(2): 135-148.

Stouten, J., Rousseau, D. m., & Cremer, D. d. 2018. Successful Organizational Change: Integrating The Management Practice And Scholarly Literatures. ***Academy of Management Annals***, 12(2): 772.

Sung, S. Y., & Choi, J. N. 2012. Effects of team knowledge management on the creativity and financial performance of organizational teams. ***Organizational Behavior and Human Decision Processes***, 118(1): 4-13.

Taylor, A., & Greve, H. R. 2006. Superman or the Fantastic Four? Knowledge Combination and Experience in Innovative Teams. ***Academy of Management Journal***, 49(4): 723-740.
Teece, D. J. 2007. Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance. ***Strategic Management Journal***, 28(13): 1319-1350.
Teece, D. J. 2010. Business models, business strategy and innovation. ***Long Range Planning***, 43(2-3): 172-194.
Teece, D. J., & Pisano, G. P. 1994. Dynamic capabilities: An introduction. ***Industrial and Corporate Change***, 3(3): 538-556.
Teece, D. J., Pisano, G. P., & Shuen, A. 1997. Dynamic capabilities and strategic management. ***Strategic Management Journal***, 18(7).
Thomke, S., & Bell, D. E. 2001. Sequential testing in product development. ***Management Science***, 47(2): 308-323.
Thomke, S. H. 1998. Managing Experimentation in the Design of New Products. ***Management Science***, 44(6): 743-762.
Thompson, J. D. 1967. ***Organizations in Action***. McGraw-Hill.
Tucker, A. L., Nembhard, I. M., & Edmondson, A. C. 2007. Implementing new practices: An empirical study of organizational learning in hospital intensive care units. ***Management Science***, 53(6): 894-907.
Tushman, M. L., & Anderson, P. 1986. Technological discontinuities and organizational environments. ***Administrative Science Quarterly***, 31: 439-465.
Urbach, T., Fay, D., & Goral, A. 2010. Extending the job design perspective on individual innovation: Exploring the effect of group reflexivity. ***Journal of Occupational and Organizational Psychology***, 83(4): 1053-1064.
Van der Vegt, G. S., de Jong, S. B., Bunderson, J. S., & Molleman, E. 2010a. Power Asymmetry and Learning in Teams: The Moderating Role of Performance Feedback. ***Organization Science***, 21(2): 347-361.
Van der Vegt, G. S., Bunderson, S., & Kuipers, B. 2010b. Why turnover matters in self-managing work teams: Learning, social integration, and task flexibility. ***Journal of Management***, 36(5), 1168-1191.
van Knippenberg, D., De Dreu, C. K. W., & Homan, A. C. 2004. Work Group Diversity and Group Performance: An Integrative Model and Research Agenda. ***Journal of Applied Psychology***, 89(6): 1008–1022.
van Woerkom, M., & van Engen, M. L. 2009. Learning from conflicts? The relations between task and relationship conflicts, team learning and team performance. ***European Journal of Work and Organizational Psychology***, 18(4): 381-404.
von Hippel, E., Thomke, S., & Sonnak, M. 1999. Creating breakthroughs at 3M. ***Harvard Business Review***(September-October): 47-57.
Vera, D., Nemanich, L., Vélez-Castrillón, S., & Werner, S. 2016. Knowledge-based and contextual factors associated with R&D teams' improvisation capability. ***Journal of Management***, 42(7), 1874-1903.
Wageman, R. 1995. Interdependence and group effectiveness. ***Administrative Science Quarterly***, 40: 145-180.
Walter, F., & Van der Vegt, G. S. 2012. Harnessing members' positive mood for team-directed learning behaviour and team innovation: The moderating role of perceived team feedback. ***European Journal of Work and Organizational Psychology***, 22(2): 235-248.
Weber, M. 1947. ***The Theory of Social and Economic Organizations***. New York: Free Press.

Wegner, D. W. 1987. Transactive memory: A contemporary analysis of the group mind. In B. Mullen, & G. R. Goethals (Eds.), ***Theories of group behavior***: 185-208. New York: Springer-Verlag.
Wernerfelt, B. 1984. A resource based view of the firm. ***Strategic Management Journal***, 5: 171-180.
Wheelwright, S. C., & Clark, K. B. 1992. ***Revolutionizing product development***. New York: Free Press.
Wiese, C. W., Burke, C. S., Tang, Y., Hernandez, C., & Howell, R. 2021. Team learning behaviors and performance: A meta-analysis of direct effects and moderators. ***Group & Organization Management***.
Winter, S. G. 2003. Understanding dynamic capabilities. ***Strategic Management Journal***, 24(10): 991-995.
Wong, S.-S. 2004. Distal and local group learning: Performance trade-offs and tensions. ***Organization Science***, 15(6): 645-656.
Wright, T. P. 1936. Factors affecting the costs of airplanes. ***Journal of Aeronautical Science***, 3: 122-128.
Zahra, S. A., Neubaum, D. O., & Hayton, J. 2020. What do we know about knowledge integration: Fusing micro-and macro-organizational perspectives. ***Academy of Management Annals***, 14(1): 160-194.
Zhang, A. Y., Tsui, A. S., & Wang, D. X. 2011. Leadership behaviors and group creativity in Chinese organizations: The role of group processes. ***The Leadership Quarterly***, 22(5): 851-862.
Zhang, Z., & Min, M. 2019. The negative consequences of knowledge hiding in NPD project teams: The roles of project work attributes. ***International Journal of Project Management***, 37(2): 225-238.
Zhao, G., Chiu, H. H., Jiao, H., Cheng, M. Y., & Chen, Y. 2021. The effect of person-team conscientiousness fit on knowledge sharing: The moderating role of internal team environment. ***Group & Organization Management***.

TABLES

Table 1. Scope of Review and Inclusion Criteria

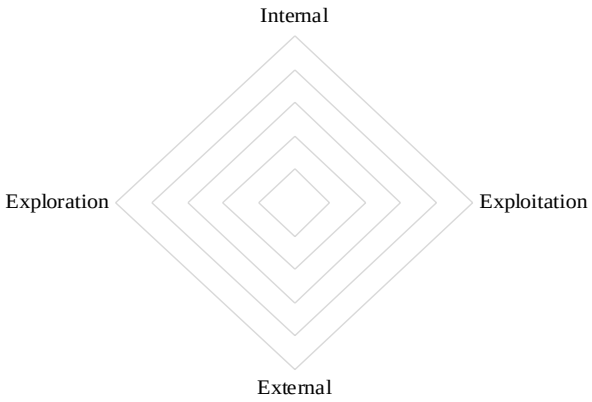
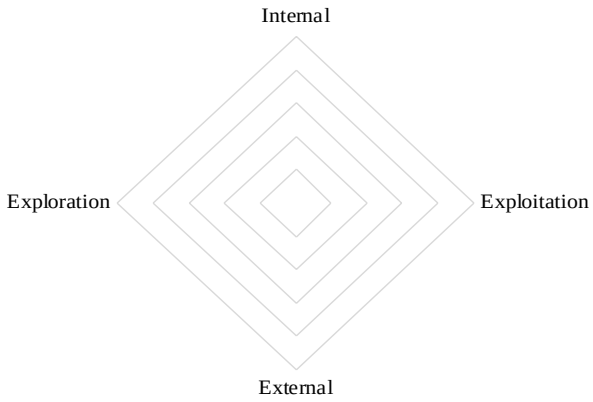
Database	PsycINFO / Business Source Premier / ABI/INFORM (ProQuest) / Web of Science
Search Terms	"team learning" / "group learning" / "team reflexivity" / "group reflexivity" / "team knowledge" / "group knowledge" / "team boundary spanning" / "group boundary spanning" / "team cross-boundary" / "group cross-boundary" / "team information" / "group information" / "team experimentation" / "group experimentation" / "team improvisation" / "group improvisation" / "team communication" / "group communication" / "communication routine" / "communication routine" / "team" AND "information

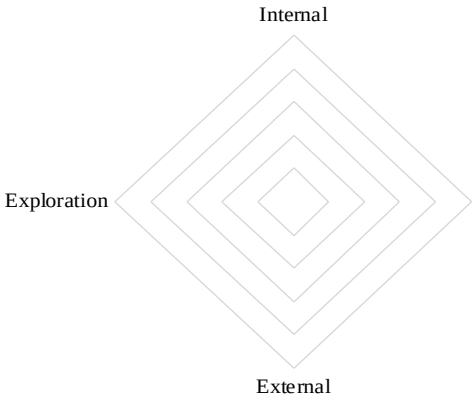
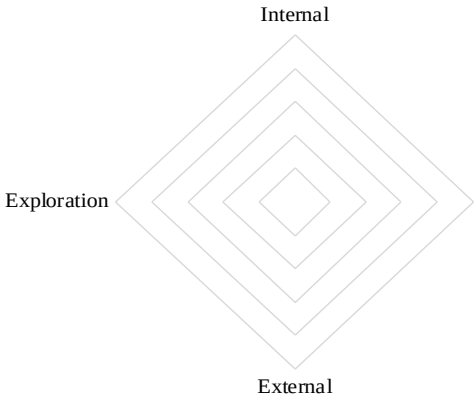
	elaboration" / "group" AND "information elaboration" / "team" AND "knowledge transfer" / "group" AND "knowledge transfer" / "team" AND "knowledge sharing" / "group" AND "knowledge sharing" / "team" AND "knowledge creation" / "group" AND "knowledge creation" / "team" AND "learning routine" / "group" AND "learning routine"
Journals FT50 Journals in Management and Select Journals in OB and Strategy or on Teams	*Academy of Management Discoveries; Academy of Management Journals; Administrative Science Quarterly; Entrepreneurship Theory and Practice; European Journal of Work and Organizational Psychology; Global Strategy Journal; Group Dynamics: Theory, Research, and Practice; Group & Organization Management; Human Resource Management; Human Resource Management Journal; Industrial and Corporate Change; Information Systems Research; International Journal of Project Management; Journal of Applied Psychology; Journal of Business Research; Journal of Business Venturing; Journal of International Business Studies; Journal of Management; Journal of Management Information Systems; Journal of Management Studies; Journal of Occupational and Organizational Psychology; Journal of Operations Management; Journal of Organizational Behavior; Journal of Product Innovation Management; Journal of World Business; Leadership Quarterly; Long Range Planning; Management Science; Manufacturing and Service Operations Management; MIS Quarterly; Organization Science; Organization Studies; Organizational Behavior and Human Decision Processes; Personnel Psychology; Production and Operations Management; Research Policy; Small Group Research; Strategic Entrepreneurship Journal; Strategic Management Journal; Strategic Organization; Strategy Science; Technovation*
Years	2007-2021
Type of Research	Empirical; real teams in real organizations.
Conceptual Clarity	Study includes team learning measures and performance outcomes (i.e., quality, efficiency, innovation, etc.) and/or managerial decisions (i.e., size, structure, interdependence, etc.).

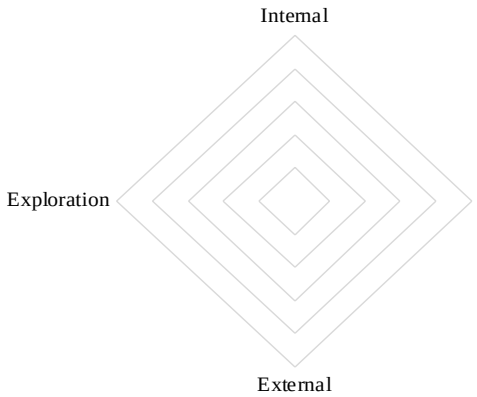
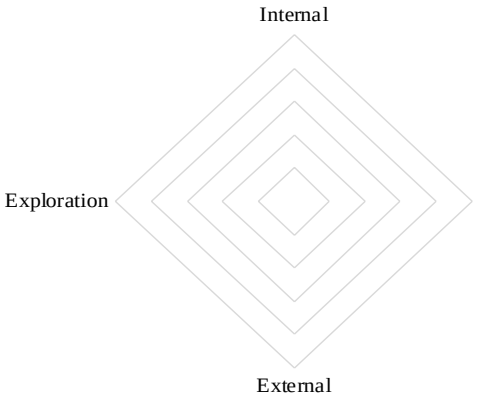
Table 2. Article Selection for Review

Journals	Articles extracted with simple keyword (ex: "team learning")	Articles extracted with complexe keyword (ex: "team" AND "knowledge sharing")	Number of articles considered for review	Number of articles included in review
Academy of Management Discoveries	1	0	1	0
Academy of Management Journal	14	10	24	5
Administrative Science Quarterly	5	2	7	0
Entrepreneurship Theory and Practice	0	1	1	0
European Journal of Work and Organizational Psychology	12	4	16	6
Global Strategy Journal	0	4	4	0
Group & Organization Management	19	7	26	13
Group Dynamics: Theory, Research, and Practice	16	1	17	1
Human Relations	13	7	20	5
Human Resource Management	7	5	11	2
Human Resource Management Journal	0	2	2	0
Industrial and Corporate Change	1	2	3	0
Information Systems Research	2	4	6	1
International Journal of Project Management	16	20	36	11
Journal of Applied Psychology	16	9	25	9
Journal of Business Research	16	21	37	3
Journal of Business Venturing	0	1	1	0
Journal of International Business Studies	2	5	7	2
Journal of Management	11	3	14	7
Journal of Management Information Systems	7	2	9	1
Journal of Management Studies	3	2	5	1
Journal of Occupational and Organizational Psychology	4	3	7	3
Journal of Operations Management	2	1	3	0
Journal of Organizational Behavior	13	9	22	5
Journal of Product Innovation Management	14	13	27	3
Journal of World Business	2	5	7	0
Leadership Quarterly	4	2	6	1
Long Range Planning	1	3	4	0
Management Science	5	8	13	1
Manufacturing and Service Operations Management	2	0	2	0
MIS Quarterly	2	3	5	2
Organization Science	15	11	26	6
Organization Studies	4	1	5	0
Organizational Behavior and Human Decision Processes	12	5	17	1
Personnel Psychology	1	0	1	0
Production and Operations Management	0	2	2	0
Research Policy	1	11	12	0
Small Group Research	52	8	60	5
Strategic Entrepreneurship Journal	1	0	1	0
Strategic Management Journal	1	5	6	0
Strategic Organization	4	0	4	1
Strategy Science	1	0	1	0
Technovation	4	5	9	1
Total	306	207	512	96

Table 3. Typology of Team Learning Routines found in the Literature

Team Learning Routine	Empirical Studies	Example of Scale
Internal-Exploitation 	Aubé et al., 2021; Bresman, 2010; Bresman & Zellmer-Bruhn, 2013; Bunderson & Boumgarden, 2010; Chan et al., 2020; Cheung et al., 2016; Choi et al., 2010; Chuang et al., 2013; De Dreu, 2007; De Jong & Elfring, 2010; Flu et al., 2021; Gibson et al., 2019; Gilson et al., 2013; Gopal & Gosain, 2010; Greer et al., 2012; Haas & Cummings, 2015; Hartmann et al., 2020; Harvey et al., 2019; Hoogeboom & Wilderom, 2020; Hu & Randel, 2014; Hu et al., 2017; Huang, 2009; Huang et al., 2014; Imam & Zaheer, 2021; Jiang & Chen, 2016; Li et al., 2019; Liang et al., 2018; Litchfield et al., 2018; Madrid et al., 2016; Rapp et al., 2014; Reiter-Palmon et al., 2018; Romanow et al., 2018; Schippers et al., 2008; Schippers et al., 2012; Schmutz et al., 2018; Shin, 2014; Sung & Choi, 2012; Urbach et al., 2010; Van der Vegt et al., 2010a; Van der Vegt et al., 2010b; Zhang et al., 2011; Zhao et al., 2021	Carter & West (1998) 1. In this team we often review the feasibility of our objectives. 2. In this team we often discuss the methods used to get the job done. 3. In this team we regularly discuss whether we are working effectively together. 4. In this team we modify our objectives in light of changing circumstances. 5. In our team we often review our approach to getting the job done.
External-Exploitation 	Bresman, 2010; Chueng et al., 2013; Haas, 2010; Park & Lee, 2014	Bresman (2010) 1. Going out to gather information regarding who to contact for advice about how to complete the task. 2. Observing the work of others outside the team to extract lessons to be applied to the task. 3. Inviting people from outside the team to discuss how to avoid repeating past mistakes. 4. Talking to people outside the team about past failures to determine ways of improving the work process. 5. Reflecting on what has worked in the past together with people outside the team with experience from similar tasks.

Team Learning Routine	Empirical Studies	Example of Scale
Internal-Balanced 	Brykman & King, 2021; Carmeli et al., 2021; Chi & Lam, 2021; Chun & Choi, 2014; Dong et al., 2017; Eisenberg et al., 2019; Friedrich et al., 2016; Gong et al., 2013; Harvey, 2015; Hirst, 2009; Huang & Liu, 2021; Huang et al., 2021; Kearney et al., 2009; Kostopoulos et al., 2011; Leroy et al., 2020; Lu et al., 2017; Maynard et al., 2019; Mehta & Bharadwaj, 2015; Savelsbergh et al., 2009; Savelsbergh et al., 2012; Savelsbergh et al., 2015; Shemla & Wegge, 2019; Shemla et al., 2020; Stephens & Carmeli, 2016	Kearney et al. (2009) 1. The members of this team complement each other by openly sharing their knowledge. 2. The members of this team carefully consider all perspectives in an effort to generate optimal solutions. 3. The members of this team carefully consider the unique information provided by each individual team member. 4. As a team, we generate ideas and solutions that are much better than those we could develop as individuals.
Balanced-Exploitation 	Abrantes et al., 2018; Brykman & King, 2021; Brueller & Carmeli, 2011; Carmeli et al., 2012; Dimas et al., 2020; Hirst et al., 2009; Parker & du Plooy, 2021; Popaitoon & Siengthai, 2014; Schaubroeck et al., 2016; Tucker et al., 2007; van Woerkom & van Engen, 2009; Walter & Van der Vegt, 2012	Edmondson (1999) 1. We regularly take time to figure out ways to improve our team's work processes. 2. This team tends to handle differences of opinion privately or off-line, rather than addressing them directly as a group. 3. Team members go out and get all the information they possibly can from others-such as customers, or other parts of the organization. 4. This team frequently seeks new information that leads us to make important changes. 5. In this team, someone always makes sure that we stop to reflect on the team's work process. 6. People in this team often speak up to test assumptions about issues under discussion. 7. We invite people from outside the team to present information or have discussions with us.

Team Learning Routine	Empirical Studies	Example of Scale
External-Exploration 	Bresman, 2010; Bresman & Zellmer-Bruhn, 2013; Brion et al., 2012; Carbonell & Escudero, 2019; Chan et al., 2021; Drach-Zahavy, 2011; Gibson & Dibble, 2013; Jiang & Chen, 2016; Popaitoon & Siengthai, 2014; Tucker et al., 2007; Vera et al., 2016	Ancona & Caldwell (1992) 1. Finding out what competing firms or teams are doing on similar projects. 2. Scanning the environment inside or outside the organization for marketing ideas/expertise. 3. Collecting technical information/ideas from individuals outside the team. 4. Scanning the environment inside or outside the organization for technical ideas/expertise.
Balanced-Exploration 	Kostopoulos & Bozionelos, 2011; Li et al., 2019; Magni & Maruping, 2013; Magni et al., 2013; Zhang & Min, 2019	Kostopoulos and Bozionelos (2011) 1. Team members were systematically searching for new possibilities. 2. Team members offered new ideas and solutions to complicated problems. 3. Team members experimented with new and creative ways for accomplishing work. 4. Team members evaluated diverse options regarding the course of their work. 5. The members of our team developed many new skills while performing their tasks.

FIGURES

Figure 1. Baseline Model

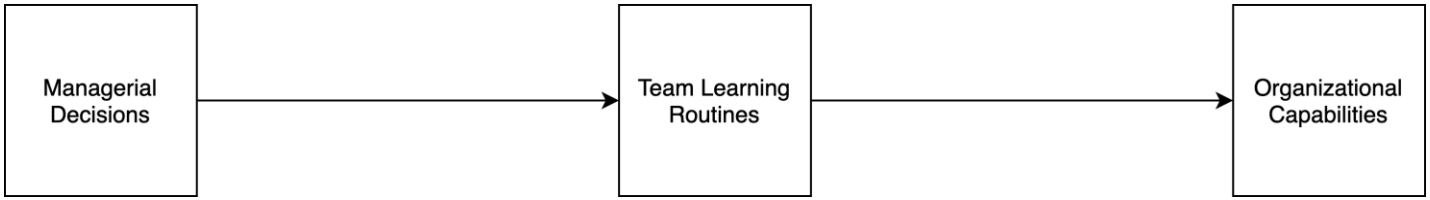
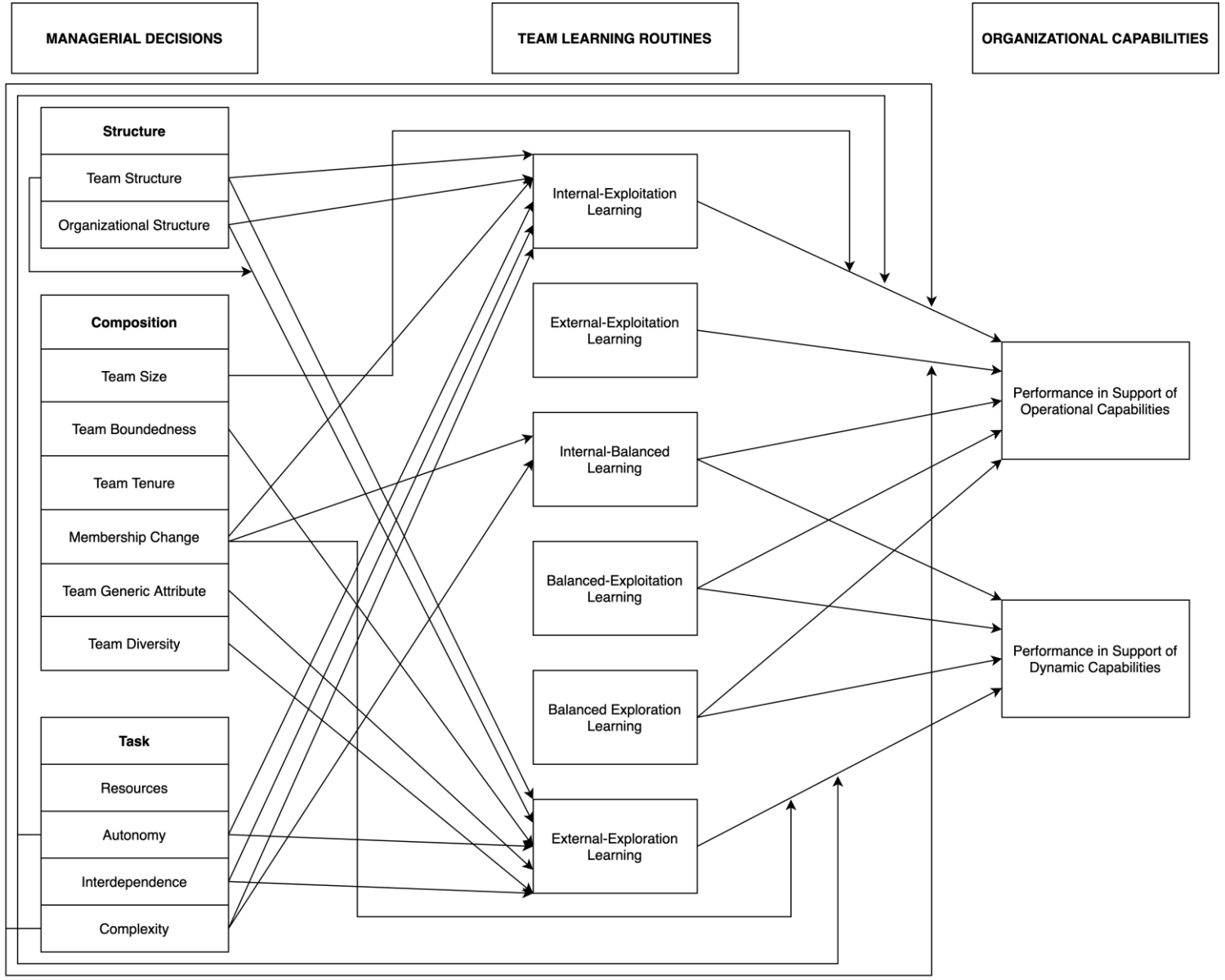


Figure 2. Detailed Model Emerging from Review



Jean-François Harvey is an associate professor in the Department of Entrepreneurship and Innovation at HEC Montréal. His research focuses on how individuals, teams and organizations learn and adapt, in particular in uncertain and ambiguous contexts. Harvey received his Ph.D. from HEC Montréal, was a visiting scholar at the University of California, Berkeley, and completed a two-year postdoc at Harvard Business School.

Henrik Bresman is an associate professor of organizational behavior at INSEAD. His research focuses on learning and change in complex organizations, with particular emphasis on teams, and has been published in scholarly journals such as Academy of Management Journal and Organization Science. He received his Ph.D. from the Massachusetts Institute of Technology.

Amy C. Edmondson is the Novartis Professor of Leadership and Management at Harvard Business School. Her research examines psychological safety and teamwork in complex organizations and has been published in scholarly journals including AMJ, AMR, and AMD. Edmondson received her PhD in organizational behavior, AM in psychology and AB in engineering and design from Harvard University.

Gary P. Pisano is the Harry E. Figgie, Jr. Professor of Business Administration and Senior Associate Dean at the Harvard Business School. His research explores how organizations innovate, learn, compete, and grow, and has been published in such scholarly journals as Administrative Science Quarterly, Management Science, American Economic Review-Insights, Decision Sciences, and Strategy Science. Pisano received his Ph.D. from the University of California, Berkeley and a B.A. in economics from Yale.