Team adaptation and the changing nature of work: Lessons from practice, evidence from research, and challenges for the road ahead

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Abstract
As the fabric of modern organizations, teams provide capacity to handle the ongoing adaptation demanded by contexts that characterize the future of work. While scholars have studied how team composition and structural characteristics facilitate team adaptation, both research and practice will benefit from also explicating the process of adapting—how a team’s active coping determines team adaptation over time. To move in this direction, we integrate perspectives on team adaptation which emphasize how teams understand complex environments and combine coordination processes to reach adaptive outcomes. This clarifies when, why, and how teams adapt, yielding performance benefits for organizations. Our goal is to offer evidence-based insights and theoretical reasoning to foster future research explaining the team adaptation–performance connection in current complex and changing work environments.

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1. Introduction

Organizational effectiveness depends more than ever on how promptly teams adapt to unexpected problems and devise solutions to dynamic task and situational demands (Burke et al., 2006). At the dawn of the so-called fourth industrial revolution (Schwab, 2017), we live in a world of increasing multifaceted, technologically driven, and accelerated change. This yields unprecedented levels of complexity (a multiplicity of interacting elements composing a system, which are also highly interdependent and diverse—Sargut and McGrath, 2011) that challenge contemporary organizations.

As a response, progressive use of automation can free humans from performing routine work, augmenting organizational capability to adapt to evolving problems innovatively and sustainably (World Economic Forum, 2018). To operate in these complex environments, organizations are using self-managing principles to build team-based structures (Bernstein et al., 2016), such as agile teams (defined as self-organized, cross-functional, and continuously adaptive teams; Lee and Xia, 2010) used by companies such as Spotify (Kniberg, 2014). These changes to how work is accomplished explain why team adaptation has gained increasing attention in team effectiveness literature, including the extension of theory beyond adaptation antecedents and outcomes to the adaptative process itself, including how teams perform in complex, changing, novel, unpredictable, and unstable circumstances (Baard et al., 2014; Rico et al., 2019).

Over the last 15 years, the bulk of this research has focused on triggers to adaptation, and how certain compositional team features (e.g. team member expertise) and configurational team properties (e.g. team structure) articulate the potential adaptability of a team, which facilitate the team adaptive processes (e.g. role adaptations), and subsequently influence team adaptive outcomes (e.g. performance level reacquisition). To date, research has devoted more effort to studying antecedents, the nature of changes demanding adaptation, and the consequences of team adaptation, rather than the adaptive process itself.

Certainly, such efforts have provided valuable knowledge about how to increase teams’ capability to respond to changes of different nature, duration, intensity and origin in their task environment (Baard et al., 2014; Christian et al., 2017). In addition, nearly all these studies render a consistent picture of a positive relationship between team-level adaptation and outcomes (Maynard et al., 2015). However, rather than capturing the team adaptive process, most studies have simply inferred its occurrence because changes were observed in team performance (Burke et al., 2006), thwarting our understanding of what was actually adjusted when teams adapt.

Thus, to better understand how team adaptation contributes to team and organizational effectiveness in complex environments, we argue for a more comprehensive and integrated perspective that considers a detailed team adaptive process. This focus is needed to discern cues for team adaptation emanating from how the team understands task changes, the role of coordination processes, and both the positive and adverse effects of team adaptation over time. Acknowledging properties of contextual cues, the active coping of teams and potential disadvantages of team adaptation are of paramount importance because team maladaptation could be disastrous in complex environments (Baard et al., 2014).

In this article, we summarize and integrate discoveries about team adaptation in the complex environments characterizing the changing nature of work, including a team adaptive process explained in Rico et al. (2019). Drawing from recent reviews on the field (Baard et al., 2014; Maynard et al., 2015), we focus on four key areas of team adaptation research (see Figure 1): (1) Prompts for adaptation, sometimes termed “triggers” demanding teams to adapt, such as alterations in the task context or the team composition. (2) Team adaptability, that is, the team characteristics that enable
readiness to adapt, like team member flexibility or the type of leadership existing on the team. (3) Team adaptive process, that is, which team processes are adjusted to cope with team changes, such as role restructuring. (4) Team adaptive outcomes, that is, the consequences either positive or negative of the adaptive process, such as better decision quality or overconsumption of team resources.

Following recent developments, our review complements the literature of team adaptation by explaining the team adaptive process considering team cognition, coordination processes in team adaptive processes (Rico et al., 2019), and the role of feedback in enhancing team adaptability over time. Importantly, our framework helps to organize extant empirical and practical evidence, clarifying what teams react to in complex environments, when teams are better able to adapt, how the adaptive process initiates, why teams adapt through different coordination processes, and how they are able to maintain their adaptability over time. Team adaptation is essential for every team but crucial for action teams (specialists cooperating on well-learned and highly interdependent tasks, which often must promptly respond to unexpected events—Sundstrom et al., 1990; Waller and Uitdewilligen, 2013), such as operating room teams. Consequently, most team adaptation theory and research has been developed for action teams. Our review may be best applied to such teams, although it is relevant to any team facing task changes.

Our goal is to offer evidence-based insights and theoretical reasoning that will foster research on team adaptation in the changing complex environments surrounding the future of work, guiding both researchers and practitioners in analyzing the role of contextual complexity in team adaptive processes. Further research in this area is critical for scholars and practitioners alike to understand the connection of team adaptation to performance and member well-being to be prepared for the changing nature of work that confronts organizations and their teams.

2. Definition of team adaptation and a framework to integrate prior research

The study of team adaptation coincides with efforts by teamwork researchers to address mediating processes that explain how antecedent variables affect team outcomes (Mathieu et al., 2008). This research distinguishes among team processes, which describe interactions focused toward task accomplishment (e.g. team conflict; Ilgen et al., 2005); emergent states, which constitute affective, motivational, or cognitive states that vary as a function of the team task environment (e.g. team climate; Marks et al., 2001); and blended mediators, composed of a mix of both processes and emergent states (e.g. team learning; Mathieu et al., 2008). Based on this approach, in accordance with recent theoretical models, team adaptation is defined as a team process triggered to cope with relevant changes in the team task environment, through which adaptability variables affect team adaptive mechanisms, yielding team adaptive outcomes (Burke et al., 2006; Christian et al., 2017; Maynard et al., 2015).

Although underrepresented in extant research, team adaptive process is the core of team adaptation, blending of team processes (i.e. coordination) and emergent states (i.e. team knowledge). This blended mediator—team adaptive process driven by team adaptability and task changes as inputs and resulting in team adaptive outputs—has the advantage of capturing the complexity of team adaptation, while avoiding reductionism and incomplete understanding. Accordingly, this consideration may be helpful in explaining the dispersion of results thwarting an integrative view (Baard et al., 2014), justifying recent efforts for clarifying the construct and synthesizing extant research on team adaptation (Maynard et al., 2015). We propose further integration across Burke et al. (2006), Maynard et al. (2015), and Baard et al. (2014) to summarize current knowledge of how team adaptation in complex environments occurs by incorporating a detailed characterization of team adaptive process (see Figure 1).
2.1. Prompts for adaptation

Figure 1 shows that understanding team adaptation first requires considering the precise nature of the cues that prompt teams to adapt. Prior research indicates it is not enough to simply consider the magnitude of change, rather team adaptation occurs because a specific alteration in the team environment modifies task demands such that the team must alter how it performs (Morgeson et al., 2015). For example, based on Wood’s (1986) taxonomy of task complexity (stating that all tasks have three components: products, appropriate behaviors, and informational cues), Baard et al. (2014) proposed a conceptual framework to specify three types of task complexity requiring an adaptive response: component complexity (the number of discrete cues and actions triggered by cues composing the task), coordinative complexity (linkages among cues, actions, and their sequencing), and dynamic complexity (degree of flux inherent in component and coordinative complexity). This implies volatility in the rate of change, which is directly relevant to team adaptation.

Another development conceptualizes team tasks as a network of events (actions performed in entities of members, teams, or organizations) interconnected by information cues (Hærem et al., 2015). A simple team task could be two events: actor “x” requesting information and actor “y” providing information, which generate information cues to connect the events, making them amenable to interpretation by other actors. Accordingly, the complexity of a task is an exponential function of network nodes (in this case, actions performed) and the ties among the nodes (connections, in this case of information cues). Such task nodes may be of different intensity, duration, and origin (e.g. task context alterations, new actors entering or leaving permanently or temporarily—Christian et al., 2017) altering the potential number of information cues and ties among events, altering task complexity in a nonlinear way. Hence, teams adapt to a network of events and information cues within a complex environment. Hærem et al. (2015) have suggested the use of a logarithmic scale (such as decibels or the Richter scale for earthquakes) to understand these sometimes-minute variations in task complexity.
Determining the impact of changing complexity on team adaptative process requires more than considering the nature and magnitude of change and the associated cues. Teams actively interact with and process information about any changes in the task context (Hinsz et al., 1997), such as adaptive automation, which considers task complexity increments, allocation of tasks in the team, team capabilities, and system performance requirements to dynamically adjust automation (Goh et al., 2019). Accordingly, it is also necessary to consider team adaptability (Maynard et al., 2015) and the adaptive process itself, through which different team processes and emergent states are adjusted to cope with changes in environmental complexity and to apply automation adaptively across industries. Hence, Figure 1 depicts team adaptability as both moderating the relationship between task complexity and team adaptive process, while also directly influencing the team adaptive process.

2.2. Team adaptability

Team adaptability reflects the capacity to change in response to variations in task complexity (Maynard et al., 2015). Several sources have been identified as the components of team adaptability: member characteristics (e.g. cognitive ability, individual expertise), task features (e.g. task interdependence), and organizational characteristics (e.g. cooperative reward structure). Essentially, configurations of such attributes create conditions that influence team effectiveness in the adaptive process (Zaccaro and Bader, 2003). From an individual-level antecedent perspective, several team composition variables, including member flexibility, task expertise, team expertise, and individual adaptability, have been conceptually linked to team adaptability. For example, member flexibility has been evidenced as relevant for achieving team responses to contextual changes, complexity, and other outcomes (De Jong et al., 2004; Lee and Xia, 2010; McComb et al., 2010). Therefore, teams with more highly flexible members may be better able to adapt. Task expertise also contributes to team adaptability by providing members with accurate knowledge needed to adequately understand the situational changes, thus deciding what to do, how to do it, and why (Tschan et al., 2000). A team which includes highly expert members in a decentralized organization may show better readiness to adapt than teams composed of novice members in a centralized organization (Bonner et al., 2015).

Team expertise is also relevant for building team adaptability. Team members who have worked together longer, especially under different circumstances, may be more likely than members of newly formed teams to pick up on internal cues. This may be because they are more cognizant of how their teammates work together (e.g. understanding when others need behavioral assistance to perform) and, thus, are able to adjust their activities toward team adaptation (Burke et al., 2006). Individual adaptability, an eight-factor construct predicting adaptive performance (Pulakos et al., 2000), has been offered as an essential ingredient of team adaptability (Ployhart and Bliese, 2006). It may be that teams composed of members who are individually more capable of adapting are able to adjust processes in the face of disruptions. Future empirical work is needed to clarify the potential effects of all these individual-level inputs on team adaptability, ascertaining whether and how the variables aggregate to the team level.

Our knowledge of team-level antecedents of adaptability, while relatively scarce, shows promise. One factor, team self-management, has been suggested as a key input shaping team adaptability (Burke et al., 2006). Self-managed teams have more behavioral discretion, autonomy, and freedom to make decisions over key team issues, including roles and task distribution, goals, rewards, leadership, and input coordination (Hackman and Oldham, 1980; Mohrman et al., 1995). Therefore, self-managed teams are expected to better match their activities to the specific contingencies faced, enhancing adaptation via the effectiveness of plans and actions (Burke et al., 2006). In contrast,
when team members are given little autonomy, they may fail to experience a sense of responsibility for their performance and are less likely to engage in critical processes (Hackman and Oldham, 1980), such as altering team processes and strategies when necessary. Hence, self-management may enable team adaptability when facing disruptions or unforeseen changes.

At an organizational level, another factor that enhances team adaptability is external direction received from leadership outside the team, as leaders may choose particular moments to help teams to review their manner of performing work (Hackman and Wageman, 2005). Specifically, leader briefings may facilitate reflective activities which develop team expertise and team knowledge, supporting team adaptation in dynamic environments (Marks et al., 2000; Zaccaro et al., 2001). Thus, the key role of external leadership in enabling team adaptation has been situated as sense-making and sense-giving processes through which leaders make available relevant change cues, and frame them to be understood, and addressed with proper actions.

However, Morgeson’s (2005) field study found that leaders’ sense-making behaviors, despite fostering team adaptation, may be perceived as intrusive and manipulative in self-managing teams that are not functionally connected to an external leader. Along these lines, as organizations increasingly structure as self-managing teams without formal leaders (Morgeson, 2005), researchers have pointed out that teams with distributed leadership may be able to better adapt to unexpected changes (Burke et al., 2006). Although this question has been indirectly tackled by comparing how teams adapt to downsizing and restructuring involving changes in team leadership positions (DeRue et al., 2008), the extent to which shared leadership is conductive to team adaptation remains unknown.

Also at the organizational level, studies have revealed the importance of information systems (i.e. the common way in which information is managed within the organization) for teams performing in high-risk environments such as nuclear power plants, hospitals, airlines, and disaster response teams (Carroll et al., 2002; Ren et al., 2008).

In summary, each of these factors is likely to enhance or hinder the quantity and quality of the changes a team can undertake to cope with task complexity variations, exerting a moderating role in the task change–team adaptation link.

2.3. Team adaptive process

The team adaptive process was characterized by Burke et al. (2006) as a recursive multilevel process involving four steps: situation assessment, plan formulation, plan execution, and team learning, together which allow team members to change their actions when coping with unexpected events (Kozlowski et al., 1999). Recent theoretical developments offer a more parsimonious explanation of the sequence proposed by Burke et al. (2006) emphasizing that by comparing team knowledge representations (i.e. networks of knowledge shared and acknowledged by at least two team members, Fiore et al., 2010), teams must notice and understand the variations in task complexity if they are to change their coordination processes to adapt (Rico et al., 2019). Accordingly, changes in team knowledge representations will ground situation assessment and team learning, and plan formulation and execution will be driven by a mix of coordination processes (implicit and explicit).

Variations in task complexity can be understood through comparing two types of team knowledge representations. The first is what the team expects to happen while performing the task, termed team mental models (TMMs), defined as members’ knowledge representation of key elements of the team’s task environment, which vary in terms of the extent to which they are shared and accurate (Mohammed and Dumville, 2001). The second includes what is actually happening while performing the task, called team situational models (TSMs), defined as the dynamic mental
model that provides in-the-moment understanding of the situation in which a team performs (Rico et al., 2008). Thus, team members understand changes in their tasks by comparing what they expected to happen (TMMs) with what is currently happening (TSMs), while performing a particular task. Based on that understanding, team members engage in combinations of explicit and implicit coordination activities to adjust their functioning. Consequently, team cognitive representations and team coordination processes support the team adaptive process; please see Figure 1 under the label “Team Adaptive Process.”

As a case in point, consider an emergency room (ER) medical team. The team’s TMMs likely include knowledge about procedures to triage patients quickly, supported by an automated expert system. Although TMMs enable teams to store and use a repertoire of alternative procedures or team functioning networks (i.e. roles connected by workflow transactions—Kozlowski et al., 1999), the modification of such procedures in the event of changes would not be possible unless we consider TSMs, which allow real-time reactions and updates over extant procedures. For example, the ER team might develop a TSM regarding a specific kind of allergic reaction when a patient goes into a particular anaphylactic shock not anticipated by the triage expert system.

Recent research suggests that sometimes a new TSM (such as the example of the allergic reaction) will match an existing TMM in many respects. However, when the team has never faced this type of situation, there is a mismatch between the new TSM and the old TMM. Rico et al. (2019) proposed the concept of TMM–TSM correspondence to indicate the degree to which the TMM and TSM contents are similar regarding what, whom, and when the team acts. In other words, the TMM–TSM correspondence is the cognitive base enabling team members to understand what is changing in the task context and what to adapt to, allowing the team to assess, modify, and create procedures or functioning networks to address variations in task complexity as contingencies occur (Kozlowski et al., 1999). Thus, TMM–TSM correspondence is key for team adaptation, as it determines the extent to which the adaptive process can occur through implicit coordination (i.e. using shared knowledge structures to anticipate and adapt to other members’ behaviors) or explicit coordination (i.e. using communication and planning processes, Rico et al., 2008).

When TMM–TSM correspondence is high, the team can be effective by engaging in implicit coordination relative to explicit coordination to operate a particular procedure or functioning network. That is, if the team perceives that task alterations (captured in the TSM) can be understood using the extant TMM, then a quick explanation (and its associated sequence of expected events connected by information cues) is formed. This means that the team’s functioning network is appropriate (perhaps with minor tuning) to the current circumstances. Alternatively, when the TMM–TSM correspondence is low, the use of explicit coordination through extensive communication and ad hoc planning will be necessary to be effective (Rico et al., 2019). Hence, the extant team functioning network would require major modifications, its replacement by another existing or newly created network. For example, if a patient in this ER scenario presents an unexpected respiratory and cardiovascular problem, this new TSM would not correspond to the existing TMM and the team would have to engage in explicit coordination to stabilize the patient. However, when there is a moderate to high TMM–TSM correspondence, the ER team can coordinate implicitly in treating the patient.

2.4. Team adaptive outcomes

Figure 1 shows important influences on the outcomes achieved by teams reported in prior research. Studies in this domain are fairly consistent in their findings, supporting positive team adaptation-adaptive outcome linkages, such as between team adaptation and task performance (e.g. DeChurch and Haas, 2008; DeRue et al., 2008; Gorman et al., 2010; Hollenbeck et al., 2011; Johnson et al.,
2006; Waller, 1999), mission effectiveness (Diedrich et al., 2005), decision-making effectiveness (LePine, 2005; Randall et al., 2011; Resick et al., 2010), and innovation (Vera and Crossan, 2005). The operational definitions of team performance in these studies have been diverse, from reduction of errors (Waller, 1999) to time for task completion (DeChurch and Haas, 2008) and decision-making accuracy (LePine, 2003). However, we observe that the consistent relationship between adaptive process and performance outcomes may be in large part due to how scholars have conceptualized team adaptation—as being an essentially positive change in outcomes.

For that reason, it is also important to acknowledge that, contrary to conventional beliefs that team adaptation necessarily produces positive team outcomes, adaptation may also entail negative outcomes. For instance, Denrell and March (2001) suggest that imprecise adaptation may have adverse impacts on individual outcomes. This may provide a more balanced and realistic picture of how adaptation impacts team outcomes. For example, when team adaptation is driven by explicit coordination, it consumes substantial team resources (e.g. cognitive processing, communication opportunities). Thus, after an adaptive effort, a team may be unable to reach an effective and timely solution. This idea was captured as flux in coordination (Summers et al., 2012), described as the hassle teams experience when changing performance strategies to cope with unexpected changes.

Even when teams coordinate implicitly, which is more efficient and quicker, there can be negative consequences. The team may arrive at a solution that apparently addresses task complexity changes but does not produce the expected results (Landon et al., 2015) because the team has not adequately processed the cues revealing unforeseen changes in the task environment. The exploration of the dysfunctions and maladaptive adaptive outcomes is an uncharted territory that has just begun to be explored (Frick et al., 2018; Maynard et al., 2015). We develop this point in more detail in our final section.

As a final step in our model, Figure 1 includes consideration of how team adaptive outcomes will recursively influence team adaptability and adaptive processes. This turns our attention to structured reflections (e.g. after-event reviews; Villado and Arthur, 2013) or other interventions that help teams to understand how their process leads to outcomes and how incorporating such reflections could increase their adaptability over time. Thus, team structured reflective processes will help teams to regulate their adaptive efforts. There is something paradoxical in reaching either positive or negative adaptation outcomes. On one hand, although it is desirable to achieve positive adaptive outcomes, it reduces the likelihood that members will review their performance and explore new functioning networks in the face of future changes (Ellis et al., 2006). On the other hand, negative outcomes may increase members’ motivation to review team processes, yielding potential positive team outcomes in the future (Levinthal and Rerup, 2006).

To reconcile this paradox, prior literature recommends that structured reflective activities should be properly introduced and conducted, whether the team obtains either positive or negative adaptive outcomes (Ellis et al., 2006; Smith-Jentsch et al., 2008). This structured reflection will enrich the team’s functioning network repertoire and help to develop shared, accurate TMMs, which should increase the team’s adaptability to cope with future unforeseen circumstances (Kozlowski et al., 1999). Further, these structured reflective activities will enhance team adaptation by providing insight that better identifies cues related to escalation of changes in task complexity, which requires revised processes to manage the network of actions and information cues. Finally, team leaders’ (Marks et al., 2000) and members’ perception of their transformational role (Charbonnier-Voirin et al., 2010) will play a key role in challenging teams after an adaptive performance to improve future adaptation.

We also note that this area has seen progress regarding longitudinal designs. Some studies have used aggregated performance scores across time to investigate the positive effects of individual differences related to adaptability (cognitive ability, openness to experience), processes (mental
models, role structure adaptation), and training inductions (goal manipulation) on higher team-level adaptive performance (LePine, 2003; LePine et al., 2000), such as communication breakdowns or increased complexity. Further, LePine (2005) investigated how a gradual task change (i.e. a degraded communications channel) influenced team performance adaptation. He found that teams composed of performance-oriented members were slower to adapt their role structure when given a more difficult performance goal than teams composed of learning-oriented members. This approach to exploiting the richness of the data suggests avenues for improved longitudinal investigation as we elaborate below.

3. The road ahead: what we do not know about team adaptation in complex environments

Following the team adaptation framework detailed above, we next identify the future research opportunities and current gaps in team adaptation in complex environments. These have not yet been addressed by extant literature, despite their undeniable relevance for the future of work. Overall, the study of team adaptation offers a clear opportunity to scaffold industries in what the World Economic Forum (2018) identified as the primary future of work challenge: upskilling the workforce. We argue that an upskilling strategy should be approached from a team lens, capable of handling complexity from a multifunctional perspective.

In this regard, one of the most studied practical consequences of complexity for organizations is how operating in complex environments increases organizational decision-making interdependence (Siggelkow and Rivkin, 2005). Such effect results in tightly coupled firms where minor changes may swiftly and randomly disseminate with unpredictable consequences. For example, the music service company Spotify struggled with service interruptions and synchronization failures because their desktop client updates required a tightly coupled articulation of many organizational units. To solve the problem, their desktop client was decoupled in separate areas and each assigned to different teams. Thus, leading software companies are formulating their business transformation and strategies from a team lens, as a way to reconcile their adaptability and reliability needs, to excel in the Fourth Industrial Revolution.

3.1. Team adaptability future research

As reviewed earlier, research has identified the relevance of inputs at different levels of analysis in shaping team adaptability (Burke et al., 2006; Maynard et al., 2015). However, empirical research examining antecedents at multiple levels in the same environment is scarce. We anticipate that antecedents across levels interact in important ways. For example, even if members have flexibility and task expertise, if they do not have the discretion afforded by self-management, it may be that the team is less adaptable.

Also, we know very little about the role of team interdependence in team adaptation. Although team interdependence is recognized as an essential characteristic of teams (Kozlowski and Bell, 2003; Wageman, 1995) and an intrinsic characteristic of emerging industrial and organizational productive schemas (Saucedo-Martínez et al., 2018), it has not been considered in relation to team adaptation. Future research may examine whether the different types of interdependence (task or outcome) have differential effects on team adaptability.

Another research gap is the extent to which team resilience (the capacity to rebound from a challenge and withstand setbacks—Sutcliffe and Vogus, 2003) is important for team adaptability. Given the implications that resilience has in situations where team members face unexpected changes and that the future of work will be rife with them, team resilience may broaden our
understanding of team adaptation. It is likely that teams consisting of individuals with high levels of resilience are better equipped to deal effectively with changes, especially if these changes lead to negative outcomes or failures. Thus, this is a relevant area of inquiry for future research on team adaptation.

From an organizational-level antecedent perspective, many contextual factors, such as climate, culture, information systems, and resource availability have yet to be explored in relation to team adaptability (Maynard et al., 2015). These organizational inputs may influence the capacity of work teams to adapt by shaping where team members should make the adjustments. While information systems have been shown to facilitate team adaptability, there are many other factors which could contribute. For example, Harrison et al. (2000) showed that national context (i.e. Taiwan vs. Australia) plays a role in the propensity of individuals to adapt to fluid work structures, but we know little about how this might operate at the team level, nor do we understand what features of the national context (e.g. cultural values, economic system, political system) might be implicated in these relationships. Moreover, the extent to which teams have easy access to proper resources (e.g. financial, temporal, human) in their organizations may significantly shape their adaptability. Overall, little is known about the organizational factors that promote or support team adaptability, although this is a critical issue for managers aiming to build highly adaptable work teams.

3.2. Team adaptive process future research

Our knowledge of the team adaptive process is quite limited because researchers do not typically measure it, but rather infer adaptive processes based on outcomes achieved. For instance, studies have manipulated team structures to shift from functional (where each member has unique resources and must coordinate with others) to divisional (where members have all resources and can act autonomously), showing that differences in the order of structural change have asymmetrical effects on how well the team can adapt (Hollenbeck et al., 2011; Johnson et al., 2006). In another study, researchers presented teams with a challenging task and then assessed the differences between high- and low-performance teams (Waller, 1999). These studies discuss team adaptive process, for example, suggesting that coordination facilitates adaptive processes, but coordination itself is not measured. Hence, team adaptive process remains the proverbial unexplored “black box.”

Thus, the main gap and future research opportunity is the need to develop a sound empirical measure of team adaptation and adaptive processes to bolster advancement in this area (Rosen et al., 2011). In the few cases where researchers have directly assessed team adaptive process, they have typically defined them as adjustments of team action processes. For example, LePine (2003) examined the extent to which roles within the team were altered following a communication breakdown, finding that role structure adaptations mediated the relationship between several team adaptation antecedents (e.g. members’ cognitive ability and openness to experience) and post-change performance. However, a large remaining research gap is the role of both team transitional and interpersonal processes in team adaptation. Maynard et al. (2015) suggest a way to address such a gap by identifying the factors shaping which team process category should be adjusted (i.e. action, interpersonal, and/or transition), as well as the type and severity of the trigger that gives rise to the need for adaptation. Depending on the type of the adaptation trigger (related to taskwork or teamwork issues), the team may need to focus the bulk of its adaptation attention on either its action (e.g. coordination, communication) or interpersonal (e.g. conflict management) processes, respectively. Focusing on the way effective adaptive processes are applied by team members, the model identifies three main mediators: communication and information sharing (Johnson et al., 2006; Stachowski et al., 2009), coordination (Burtscher et al., 2010; DeChurch and Haas, 2008; Rico et al., 2008; Waller, 1999), and cognition (Burke et al.,
Combining the insights above, we compensate for the lack of attention given to the adaptive process that accounts for extant findings. Measuring both team cognition structures and changes in coordination processes may capture the process of how teams adapt (including communication as an explicit coordination mechanism—Rico et al., 2008). Accordingly, there is a long tradition in the team cognition literature regarding TMM measurement (for a detailed review, see Mohammed et al., 2017), and some promising studies measuring TSMs (e.g. Hamilton et al., 2010). TMMs and TSMs can be interrelated through polynomial regression (Rico et al., 2019). Both explicit and implicit coordination, meanwhile, may be gauged either through observational measures, self-reported scales, or team member interviews following adaptive episodes (Grote et al., 2010; Rico et al., 2016; Lewis, 2003). The differential occurrence of coordination processes may be considered through their inclusion as mediators in regression models, which also consider the amount of TMM–TSM correspondence or the influence of team adaptability variables (Rico et al., 2019). This quantitative approach will be easier in team-based organizations, particularly, in those mainly composed by action and project teams articulating new organizational structures which already cope with the complexities of the future of work, such as technology or health care firms, financial services, or automotive and aerospace industries.

In any case, these efforts for mapping the adaptive process from a cognitive (team knowledge) and behavioral (coordination) perspective should likely need to be completed with motivational and affective perspectives to completely portray all specific adjustments teams must make to adapt successfully. For example, despite whether a team notices a change and knows how to coordinate in response to events, it may lack proper motivation to implement the changes. Also, a strong negative emotion may block their actions, jeopardizing team adaptation outcomes. Thus, following recent theoretical developments (e.g. Gardner and Quigley, 2015), we surmise that motivational and affective factors are likely shaping the way the adaptive process unfolds and ends.

Another important research opportunity is the nature of the triggers initiating team adaptive processes. This research is mostly vague in its description of what elements of the task changed and how that change creates a need for adaptation, demonstrating a need to know more about why a team engages in adaptation efforts. For example, Waller (1999) suggests that the speed with which environmental changes are recognized and appropriate responses are enacted is related to subsequent adaptive team performance. We also lack understanding about which characteristics of the changing condition are most relevant and powerful for triggering team adaptation processes. As discussed earlier, several characteristics of the changing condition or trigger have been suggested, including speed, magnitude, severity, frequency, duration, type, or perceived importance (LePine, 2003; Maynard et al., 2015). Christian et al. (2017) specify the way researchers have treated changes or triggers of team adaptation, which is a promising departure point for understanding the types of adaptive change. We encourage researchers to continue this path, but urge recognition of teams’ active role in understanding their task environments. Understanding team complexity is a key collective skill to be nurtured if teams are to fuel the capacity of our industries to thrive.

A final area in need of further examination is how team temporal factors affect team adaptive process. Despite longitudinal research involving both individual- and team-level adaptation (Maynard et al., 2015), there are many opportunities for longitudinal research to fully understand the effects of temporal factors. For example, what is the role of prior team performance on subsequent team adaptive process? Past success may lead to persistence and solidification of well-known routines, which is effective under stable conditions, but it may lead the team to repeat the same behavioral pattern even when the situation requires a change within the team (Audia et al., 2000;
Uitdewilligen et al., 2018). Thus, prior high team performance may not ensure high performance in the future when the team is faced with important disruptions. This should be carefully considered to avoid excessive reliance on automation. Adaptive automation, in which automation levels are managed by teams, may be the key.

These relevant observations are only possible if team adaptive processes are examined from a true longitudinal perspective (i.e. at least three time points). Collins et al. (2016) clearly show the relevance of the questions that may be addressed from this standpoint, such as revealing differential patterns in the adaptive process. For example, the type of trigger may mean that adaptive coordination is sustained or incurs inflections (revealing nonlinear dynamics) right after a task change (i.e. reacquisition phase—Lang and Bliese, 2009). The use of growth modeling for empirically testing these ideas is clearly a way forward (Collins et al., 2016).

Finally, the examination of team temporal factors in the study of team adaptive process will benefit from the incorporation of the Marks et al. (2001) team processes episodic approach. By acknowledging that teams iteratively move through transition (i.e. preparing for the task) and action (i.e. executing the task) phases in performing their duties, we can obtain a more complete perspective regarding the underlying micro-processes of team adaptation. For example, we gain understanding of the extent to which action and transition phases require different types of coordination activities to ensure effective adaptive outcomes (Rico et al., 2019).

3.3. Team adaptive outcomes future research

While acknowledging the variety of adaptive outcomes in literature described earlier, there remain numerous opportunities for continuing research. We join with others (Frick et al., 2018; Maynard et al., 2015) in stressing the need for considering the possible “dark side” of adaptation. While no empirical research yet addresses this area, it may be very useful to consider the potential negative outcomes linked to team adaptation, including conditions in which adaptive outcomes may negatively influence team performance. To question our current overtly positive view of team adaptation, Frick et al.’s (2018) recent work identifies four sources of team maladaptation: (1) lack of identification and meaning adscription of cues signaling a need to adapt, (2) failure to craft a plan to respond to the need to adapt, (3) inability to take action and implement the plan to adapt, and (4) inattention to debrief the adaptive process and take advantage of the learnings in future adaptation attempts. The longitudinal articulation of these maladaptation sources reveals several potential negative outcomes along the adaptive process that account for the “dark side” of team adaptation. Training and development initiatives should tackle such potential negative outcomes to help teams to better shape their response to the future of work challenges.

In addition, extant research has been mainly conducted at the team level of analysis. Thus, we do not know the real impact that team-level adaptation may have on organizational or individual-level outcomes (Baard et al., 2014). Future research on team adaptation should consider the cross-level implications of team adaptive outcomes by adopting multi-level research designs. For instance, how does working for an organization that is more or less able to adapt in the face of changes impact constituent work teams, in terms of both performance outcomes and affective reactions? If an organization has a strong capability to adapt, this may increase team efficacy and potency and teams’ propensity to make efforts to adapt to change in contrast to teams working for organizations showing less adaptability.

Like others, we argue that if we want the concept of adaptation to be useful in organizational science, it must span all levels of the system, including individuals, multi-team systems, and organizational levels (Kozlowski and Klein, 2000). The exclusion of levels other than the team level is problematic because teams are embedded in nested systems of context and are thus influenced by,
and exert influence on, their environment (Burke et al., 2006). Thus, bottom-up and top-down processes should be considered simultaneously as they both contribute to team adaptive outcomes. There is a clear need to bridge levels, but this integration has to be explicit about what is changing, what levels are implicated, and what adaptive mechanisms are involved (Baard et al., 2014).

In addition, our understanding of team adaptation could benefit from inclusion of dynamic trajectories in team adaptive performance outcomes (Collins et al., 2016). As we reviewed earlier, although some empirical work uses longitudinal assessment of performance adaptation, studies differ on the analysis employed. Some have aggregated performance scores across multiple adaptive trials (LePine, 2003; LePine et al., 2000), whereas others have used longitudinal analyses to investigate fluctuations in adaptive performance over time (LePine, 2005). When longitudinal data are aggregated, dynamics in adaptive outcomes are obscured. Research panel designs where both processes and performance are measured at least three times and analyzed longitudinally (Collins et al., 2016; Ployhart and Vandenberg, 2010) are necessary for investigating these trajectories. Another research gap resides in the consideration of other possible outcomes or by-products of team adaptation. For example, how does team adaptation affect team creativity? The construct of team creativity has gained great popularity in the last decades. Vera and Crossan (2005) examined team improvisation, a similar construct that was found to be trainable and positively related to team innovation moderated by various team and contextual factors (expertise, teamwork quality, culture, and so on) in field-based teams. We view this line of inquiry as a promising extension of existing research.

Despite decades of research on both team adaptation and self-organizing teams, the focus remains on creating organizational structures for control and alignment. This impedes progress on many issues highlighted in our review. Thus, collaborative research efforts (between practitioners and scholars) in corporations interested in achieving both alignment and adaptation will help to address key questions such as what organizational forms are best to support the kind of team adaptation required in future work settings.

4. Implications for practice

Managers and team members alike seek increased understanding of the factors and processes which improve team adaptability, adaptive process, and performance to successfully respond to the demands imposed by complex environments. At the individual level, current research recommends selecting members for their flexibility, task expertise, team expertise, and individual adaptability. These can be assessed with situational and scenario-based interview techniques, as well as targeted interviewing that asks individuals to describe past situations that required adaptation, how they adapted, and what outcomes were achieved. Alternatively, members’ adaptability characteristics could be developed through training programs involving initial diagnostics and reflection, particularly promising through 360-degree assessment formats, change-and-response role-playing, and repeated diagnostics and reflection.

Coupled with developing members’ adaptability characteristics, and considering a team level of analysis, managers might also reflect on whether they give teams the opportunity (and latitude) to adapt. Research suggests organizations make trade-offs between alignment and adaptability (Gibson and Birkinshaw, 2004). That is, in the interest of coordination, integration, and combination of efforts, bureaucratic structures may reduce the flexibility teams need to make changes (Zellmer-Bruhn and Gibson, 2006). Developing adaptive automation contexts that offer teams support and trust alongside discipline and stretch goals could be one path toward enabling a happy medium across alignment and adaptability.

At the organizational level, the centrality of technology in the future of work is well captured in the Industry 4.0 concept (Lasi et al., 2014). Industry 4.0 advocates for designing smart working
environments, with a strong interconnection between productive tools and people, incorporating physical cyber systems (i.e. systems operating with computer-based algorithms, connected with the Internet and its users) that offer clear information to ease human decision-making, assisting performance of unpleasant and risky tasks, and even autonomously assuming low-level operative tasks and decisions. As such, professionals experience these information systems as a set of tools simultaneously enhancing and reducing complexity, thus providing a mixed set of cues on the former alignment-adaptability continuum that will make them struggle to find the right balance. Structured reflective activities may facilitate team adaptation by helping members to better identify cues about technology demands and cycle between different coordination processes to match task complexity demands.

However, these steps address only the inputs into team adaptation. Managers and teams might also attend to the adaptive process itself. As reviewed, conceptual work highlights several promising team processes in the adaptive process, including communication, coordination, and cognition (i.e. information processes). This represents a good place to start to improve team adaptation. In this regard, we offered a measurement strategy to gauge these processes, that may be combined with practices such as recording audio-based meetings (i.e. teleconferences) or video-taping face-to-face interactions, then reviewing the communication and coordination that occurred. This practice can reveal breakdowns and weaknesses, as well as the instances in which team processes worked well.

On that note, earlier, we mentioned how critical it is for teams to engage in after-event reviews and other reflexive processes, even when things go well. This underscores what the team is doing right, for example, highlighting that they are using a proper mix of implicit and explicit coordination, and attending to the cues in their particular environment that signal a need to shift from one to the other. If teams fail to do so, key aspects of emergent situations may never be incorporated into the team’s situational models, and therefore, an overreliance on implicit coordination may develop. As we argued, accurate situational models are critical for sustaining team adaptation over time.

These implications are readily applicable to agile teams, articulated as a response to the accelerated rate of change in technologies and business, impossible to address with traditional planned and heavily documented approaches (Nerur and Balijepally, 2007). Agile teams emphasize adaptation by encouraging ongoing delivery of technological solutions, under constant communication and collaboration with users that will likely change requirements on their side. Extant research reports mixed evidence on the extent to which adopting agile practices improves the ability of teams and organizations to perform under changing circumstances (Dybå and Dingsøyr, 2008; Lee and Xia, 2010). However, we speculate that systematic interventions considering team staffing and structuring activities (balancing alignment with adaptability), and encouraging reflective and review activities for key team adaptation processes (e.g. information sharing, coordination), will enhance agile team effectiveness.

5. Adapting teams for the future of work

The future of work challenges organizations now, and teams can be an important part of moving forward. Teams have two complementary characteristics: a great capacity to operate in contexts with increased complexity and ability to counteract the unexpected. Thus, adapting our teams for the future of work means enabling them to cope with both ongoing microchanges and acute, sudden macrochanges. To that end, we offer three main takeaways (summarized in Table 1) which will help both practitioners and scholars progress relevant organizational practices and collaborative research.
First, for adaptability, organizations may need to create conditions for teams to be adaptive (Hackman, 2011). Extant findings reveal how culture, reward, and organizational structures affect the capacity of teams to transition and work in fluid organizational structures (e.g. Harrison et al., 2000; Johnson et al., 2006; Moon et al., 2004). Thus, scholars and practitioners could discover how to create agile and self-managing organizational structures around teams, accompanied by strong teamwork cultures where mistakes are embraced to enable team adaptability (Bernstein et al., 2016). Regarding organizational structures, the current trend is applying the logic of self-management at the organizational level. For instance, structures such as holacracy build the organization around teams that hold decision-making processes as well as the authority to govern the organization through a constitution developed by the teams themselves (Bernstein et al., 2016). Approaches like holacracy show a clear path to create conditions for teams to be both maximally adaptable and reliable, which addresses the main paradox that the future of work imposes on current organizational teams.

Second, focused on the adaptive process, teams could develop the capacity to understand changes and react to them. To do so, we should craft training strategies with a balanced attention to cognition (team cognitive representations), actions (ability to use a mix of coordination processes), and emotional and motivational facets (autonomous motivation and self-regulation). Training strategies based on perturbation, where team members’ coordination patterns are challenged to trigger greater team flexibility and adaptability (Gorman et al., 2010), are particularly promising. We suggest that this approach may be more effective for the future of work than procedural or cross-training, where team members are reinforced to follow a procedure when a particular stimulus appears, or are exposed to and practice other team members’ roles, respectively. Perturbation training incorporating a strategic use of technology will support team development of algorithms and routines to perform regular actions, freeing their capacity to better counteract the unexpected. For example, a soccer team training under a perturbation condition (e.g. losing a teammate) may get information through Global Positioning Satellite vests that allow the team to understand which defense and attacking configurations will maximize its performance, considering the new situation. This helps the team to reduce readjustment efforts and focus on developing its game, to ensure a victory.

Finally, focused on team adaptive outcomes, teams may benefit from incorporating an ongoing procedure for structured reflective activities. These activities will feedback and reinforce the former two recommendations: by helping teams to identify which conditions enhance their adaptability and by supporting the above-mentioned operative capacity of teams. Structured reflective activities will refine TMMs and improve team identification of cues signaling the need for change, team timely and efficient response to changes (such as shifting coordination processes), and the emotional regulation required for adaptation. For example, to cope with the accelerated pace of change the future of work impose on teams, structured reflective activities will increase team awareness and flexibility in the usage of different emotional regulatory strategies (e.g. reappraisal and suppression; Bonanno and Burton, 2013). For team adaptation to be effective, the strategic use of emotion regulation would be contingent to the origin, duration, and intensity of the task changes.
In addition, structured reflective activities develop team resilience, and psychological team climates that nurture teams after adapting and recovering from maladaptation (Frick et al., 2018). Overall, these reflective activities increase team awareness of the dark side of adaptation, but also the cost of not adapting, creating a proactive and strategic stance to foresee ongoing changes and quickly recover from the unexpected. In this way, teams will be on more solid ground to respond to the future of work demanding innovation, new services, and products development.

6. Conclusion

The changing nature of work has fueled the progress made over the course of the last two decades in theorizing and examining team adaptation. We are encouraged by the inclusion of environmental complexity into recent models, and the awareness of the need to fully understand team adaptive processes, rather than simply the outcomes teams achieved through change. Further, we see much promise in continuing to examine these issues and exploring with greater precision team adaptation over time, with special attention to team knowledge representations and coordination, by using more comprehensive longitudinal designs. Our expectation is that ongoing efforts in this area will improve upon and further develop our readiness for the future of work through the better understanding and management of team adaptation for team managers and members alike.

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References


