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Teamwork Situated in Multiteam Systems: Key Lessons Learned and Future Opportunities

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Many important contexts requiring teamwork, including health care, space exploration, national defense, and scientific discovery, present important challenges that cannot be addressed by a single team working independently. Instead, the complex goals these contexts present often require effectively coordinated efforts of multiple specialized teams working together as a multiteam system (MTS). For almost 2 decades, researchers have endeavored to understand the novelties and nuances for teamwork and collaboration that ensue when teams operate together as "component teams" in these interdependent systems. In this special issue on the settings of teamwork, we aim to synthesize what is known thus far regarding teamwork situated in MTS contexts and offer new directions and considerations for developing, maintaining, and sustaining effective collaboration in MTSs. Our review of extant research on MTSs reveals 7 key lessons learned regarding teamwork situated in MTSs, but also reveals that much is left to learn about the science and practice of ensuring effective multiteam functioning. We elaborate these lessons and delineate 4 major opportunities for advancing the science of MTSs as a critical embedding context for collaboration and teamwork, now and in the future.

Keywords: multiteam systems, intergroup dynamics, teamwork, collaboration, superordinate goals

The survival of the human species has stemmed, in part, from our ability to specialize and collaborate in large groups (Horan, Bulte, & Shogren, 2005). This capacity for specialization and large-scale collaboration continues to be necessary as we attempt to respond to pressing challenges in domains such as cybersecurity, health care, space exploration, disease prevention, or disaster response. Such contexts present important overarching "superordinate" goals that require the coordinated efforts of multiple specialized teams that address subfacets of the larger problem. Referred to as *multiteam systems* (MTSs; Mathieu, Marks, & Zaccaro, 2001) in the organizational sciences, these organizational forms protect us, save lives, produce cutting-edge scientific breakthroughs, and maintain our daily functioning as a society. MTSs may even propel us into the new territories of deep space, as the National Aeronautics and Space Administration (NASA) aims to send a team of humans to distant destinations such as Mars (Vessey, 2014).

Although MTSs have existed for quite some time in organizations, their recognition, or notoriety, as an important, yet challenging, organizational form has received increasing attention from organizational researchers over the past two decades. Unfortunately, MTSs often struggle to achieve their superordinate goals due to the coordination and collaboration challenges unique to working across multiple component teams. Many of these struggles can be successfully overcome. However, critical breakdowns have resulted in major failures, such as the costly loss of the Mars

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Climate Orbiter satellite almost two decades ago (See Figure 1).

Members of this MTS—including a systems development team that created the necessary equipment and software, an operations team that oversaw the launch and flight of the Orbiter once in space, and a project management team providing leadership—were committed to the goal of launching a robotic space probe to better understand the climate and surface characteristics of Mars. Moreover, if examined in isolation, each of the teams comprising the Mars Climate Orbiter system achieved their own successes: The Orbiter was built and launched, costs and activities were managed, and the Orbiter was carefully monitored and tracked.

However, key differences arose in the teams regarding psychological norms and processes—differences that were not necessarily problematic within teams but created major issues between teams. Perhaps most critically, software created by the U.S.-based systems development team relied on miles, a measurement unit customary to the United States, whereas the operations team navigating the Orbiter after launch relied on monitoring software using metric units (i.e., meters). Further, these teams were not very familiar with the details of the others' roles, nor did they have adequate mechanisms in place to coordinate, monitor, and troubleshoot the Orbiter together, all of which would have aided in ensuring a more efficient way to handle this error once identified. Ultimately, these breakdowns of communication, coordination, and management processes between teams brought the Mars Climate Orbiter too close to the upper atmosphere of the planet, causing its destruction and resulting in the loss of a $500 million multiyear effort, including the $125 million lost on the Orbiter and failures in subsequent missions that relied on data which was never received (Mars Climate Orbiter, 1999).

The Mars Climate Orbiter disaster grounds the importance of acknowledging the unique considerations for teamwork situated within a system of interdependent teams. Our primary objective is to advance the science and practice of facilitating teamwork in these types of critical MTS contexts by synthesizing what is known thus far regarding the novelties and nuances brought forth when teams are closely linked with other teams in pursuit of superordinate goals, and identifying opportunities for future advancement. Toward these ends, we offer an integrative reflection on the

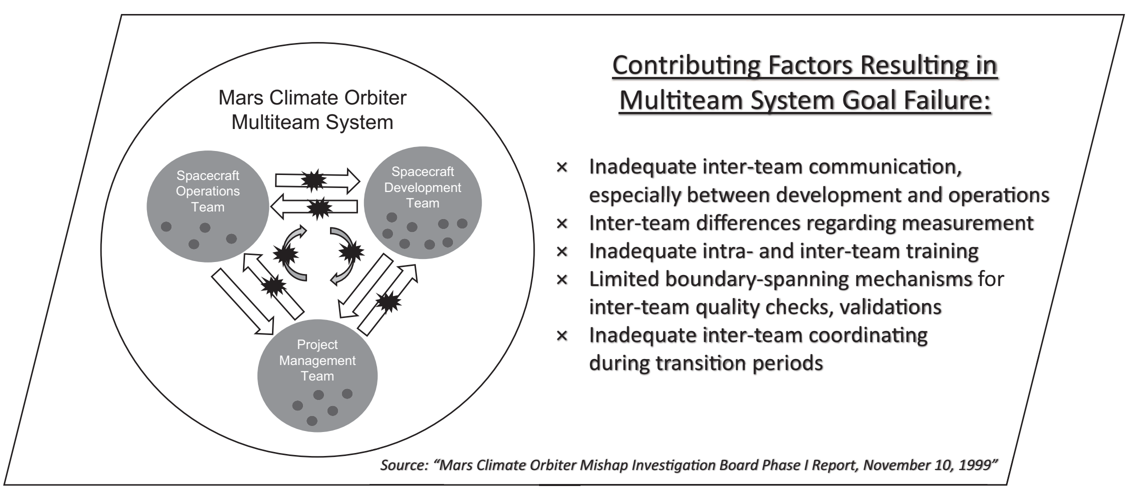

Figure 1. Mars Climate Orbiter multiteam system (MTS). This figure provides a structural representation of an exemplar MTS and outlines the major contributing factors impacting its failure to achieve overarching superordinate goals.

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existing body of MTS research, summarized in the form of seven key lessons learned. We end by identifying four opportunities that must be seized in order to best advance the future science and practice of ensuring effective MTS functioning.

Review Approach and Resulting Organizing Framework

To uncover key lessons learned from MTS research to date and clarify opportunities for future advancement, we conducted a literature search of empirical, qualitative, and quantitative research on MTS functioning. Guided by suggestions for a systematic approach to reviewing academic literature (Tranfield, Denyer, & Smart, 2003), we searched scholarly databases (e.g., Web of Science, PsycInfo) that include publications in fields such as industrial and organizational (I/O) psychology, management, social psychology, communications, human factors, computer science, health care, aviation, and industrial engineering using the keywords "multiteam systems," "multiteam projects," "intergroup collaboration," "distributed systems," "joint task forces," and "teams of teams." Our search yielded an initial set of over 900 journal articles, technical reports, dissertations, theses, book chapters, and conference proceedings. From this initial list, we removed sources that did not address MTSs per the original definition proposed by Mathieu and colleagues (2001): "two or more teams that interface directly and interdependently in response to environmental contingencies toward the accomplishment of collective goals" (p. 289). We made the decision to keep theoretical sources as part of our review given the limited number of empirical sources available and the benefit of using theoretical work to help identify future opportunities, resulting in a final set of 201 sources.

All identified sources were then independently reviewed by the two coauthors to construct major themes. Our coding of each article was guided by the overarching question: What do we know about teamwork and collaboration in MTS settings? In particular, we organized our coding of each article around the following three questions: (1) Why is it important to understand teamwork in MTS settings?; (2) What phenomena facilitate and/or prevent collaboration success in MTSs?; and (3) What are the evidence-based best practices for facilitating collaboration in MTSs? After synthesizing the literature and identifying key themes, we asked, What do we still need to know about teamwork and collaboration in MTS settings? Through a series of discussions, we identified a final list of lessons learned (see Table 1) and opportunities (see Table 2).

Overall, we find that MTS researchers have leveraged and extended foundational teams theories and perspectives in order to begin to understand teamwork situated in multiteam contexts. Specifically, teams researchers have long argued that team inputs, such as member characteristics, training, or organizational contexts, shape the patterns of teamwork behaviors or processes (e.g., coordination, information sharing) and emergent psychological states (e.g., trust, cohesion, shared cognition) that arise among team members during team interaction. In turn, teamwork processes and states are key mediators of the relationships between inputs and outcomes for individuals and teams, such as learning or performance (Ilgen, Hollenbeck, Johnson, & Jundt, 2005; Kozlowski & Ilgen, 2006).

Building on this foundational perspective of team functioning, Figure 2 uses an exemplar MTS structure to illustrate how input-mediator-outcome views have been extended to the MTS context. The left side of Figure 2 depicts the commonly recognized inputs to MTS functioning. In this exemplar system, there are three 3-member teams, each of which is characterized by unique compositional attributes (i.e., who is on each team), member linkages (i.e., how members are linked together), and developmental trajectories (i.e., how teams change over time; Zaccaro, Marks, & DeChurch, 2012). Additionally, the MTS, as a whole, is characterized by system-wide compositional (e.g., what teams are in the system), linkage between teams (e.g., how are teams linked together) and developmental (e.g., system tenure) attributes. As the middle of Figure 2 indicates, attributes originating at different levels (e.g., individual, team, system) give rise to teamwork processes and psychological states within (i.e., intrateam) component teams, linking fellow teammates to one another, as well collaborative processes and states between (i.e., interteam) component teams, linking

Table 1
Key Lessons Learned Derived From Research on Teamwork in Multiteam Systems (MTSs)

Lessons	Key findings
Question 1: Why is it important to understand teamwork in MTS contexts?	
Lesson 1. MTSs often appear in important task contexts that are ambiguous, multifaceted, dynamic, and demand a sense of urgency.	• Multiple layers need to be unraveled in order to understand and address complex problems. • There is no "right" answer or "right" way for many complex challenges. • Task demands and environmental features change regularly and frequently in unexpected ways. • Goals need to be achieved within an appropriate—and often urgent—time frame.
Lesson 2. MTS structures provide the specialization, flexibility, and rapid integration of member contributions needed to tackle important problems in complex task contexts.	• Goal specialization helps to break down *ambiguity*, provide clarity in roles and responsibilities. • MTSs offer flexibility in adjusting composition and linkages, because structures are not tied to one individual expert or one organization. • MTS flexibility allows for rapid adjustments in *dynamically* changing task environments. • Specialized contributions can be iterative and flexible, with workflows revisited and realigned to address the needs of *time-sensitive* tasks.
Question 2: What key phenomena impact collaboration effectiveness in MTSs?	
Lesson 3. The way we think about teamwork phenomena must shift when moving from "teamwork within a team" to "teamwork in an MTS."	• Countervailing forces, such as empowering component teams and developing cohesion, may help teams but hurt MTS performance. • MTSs must be aware of team and MTS functioning at the same time, to balance needs. • Boundary spanning is a critical facilitator of working effectively across teams.
Lesson 4. Even with shared goals, features of MTSs and their embedding contexts can create barriers for collaboration across teams.	• The benefit of multiple component teams—diverse skills sets, expertise, workload demands—can also create real/psychological divides between teams. • Affective states (e.g., trust, psychological safety, cohesion) are especially problematic for encouraging divisions if they are strong within but not across teams. • Although dynamic environments often require MTS structures, too much dynamism can break down MTS functioning and reduce system effectiveness.
Question 3: What are the evidence-based best practices for facilitating effective collaboration in MTSs?	
Lesson 5. Incorporating between-team elements as part of team training can improve both team and MTS performance.	• Team training targeting only within-team skill development will improve team performance but will not necessarily improve overall system performance. • Members of MTSs need to develop skills that facilitate effective processes within teams as well as between teams.
Lesson 6. Attending to MTS structures and work design is an important part of managing the coordination needed for effective MTS functioning.	• Managing the structure of coordination through control mechanisms (e.g., norms, guidelines, charters, rules, meetings) supports more efficient and effective collaboration across teams. • Using participative and iterative system design procedures can help sustain member motivation and identify methods of minimizing process loss and maximizing process gains.
Lesson 7. Leadership influence is a powerful process for MTSs that must be integrated and managed across the system to maximize its benefits.	• Leadership processes can have significant positive effects on interteam coordination and MTS performance. • Leadership can be both a formal and an informal process in MTSs. • Identifying patterns or networks of leadership influence in MTSs can help to manage "who influences whom" in order to achieve system goals.

members of different teams. In turn, teamwork processes and states within and across teams are key mediators of input–outcome relationships for individuals, teams, and the system as a whole. Additionally, like single teams, MTSs cycle through transition and action performance "episodes" or phases as they complete group tasks (Marks, Mathieu, & Zaccaro, 2001). Whereas transition phases are characterized by preparatory teamwork processes, such as planning or strategizing, action phases are characterized by task completion processes such as coordination behaviors and tracking mission progress.

In summary, as Figure 2 illustrates, MTSs contain at least two distinct teams, each of which has its own attributes, processes, states, and team goals (Campbell, 1958; Hollenbeck, Beersma, & Schouten, 2012; Salas, Dickinson, Converse, & Tannenbaum, 1992). Additionally, all MTS component teams are part of a larger interdependent system with system-level attributes, processes, states, and overarching goals. As summarized in Table 1, and highlighted in Figure 2, research on this complex organizational form has begun to clarify the key drivers of, and barriers to, collaboration effectiveness across

Table 2
Opportunities to Advance the Science and Practice of Teamwork Situated in Multiteam Systems (MTSs)

Number	Description of opportunity
Opportunity 1	Pay more attention to where MTSs "live and operate."
Opportunity 2	Clarify conditions and core competencies that facilitate MTS functioning.
Opportunity 3	Focus more intentionally on how to best measure teamwork in MTSs, particularly in terms of leveraging technology.
Opportunity 4	Use MTSs to study MTSs—engage in more interdisciplinary perspectives in thinking, researching, and living in MTSs.

MTSs. In the following, we elaborate on these key lessons learned, beginning by answering the question, why is teamwork in MTSs important?

Question 1: Why Is It Important to Understand Teamwork in MTS Contexts?

Addressing Question 1, we identified two major themes. First, our review revealed that there are certain common features of the task contexts in which MTS organizational forms are often observed (Lesson 1). Second, we find that MTS structures, which support specialization as well as flexibility and rapid integration of member contributions, are well suited to these task conditions and are often better suited for these conditions compared with traditional organizations or stand-alone teams (Lesson 2).

Lesson 1: MTSs Often Appear in Task Contexts That Are Ambiguous, Multifaceted, Dynamic, and Demand a Sense of Urgency

MTS researchers have identified many environments in which MTS structures appear to be prevalent, yet there has

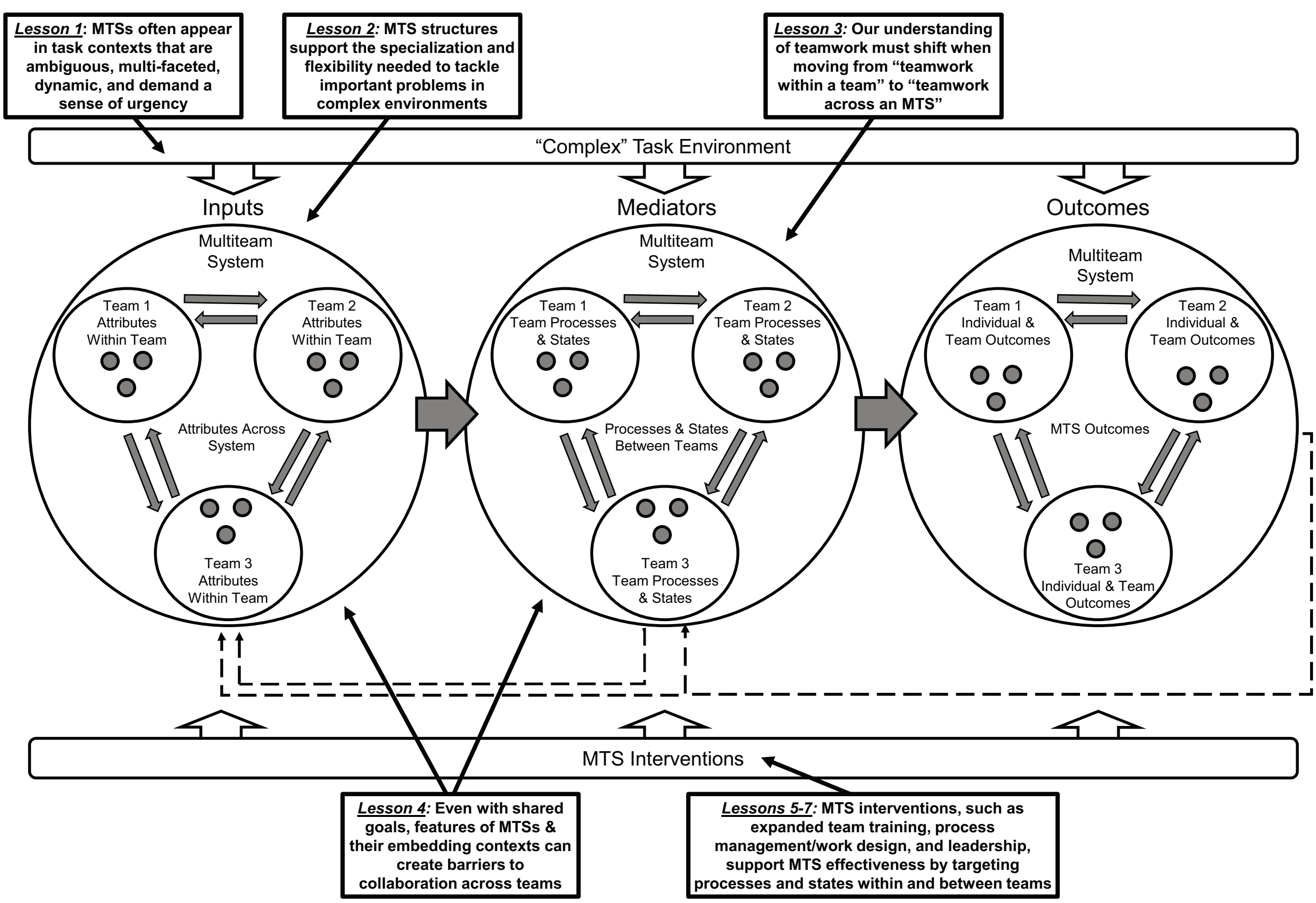

Figure 2. Organizing framework of teamwork situated in multiteam systems. This figure represents an organizing framework of key components contributing to multiteam system effectiveness and overarching lessons learned related to these components.

been less synthesis to date as to the commonalities across these contexts. For example, Mathieu et al. (2001) utilized a medical response MTS as a defining MTS example, whereby fire, EMT, surgical, and recovery teams must work together for a car accident victim's survival and recovery. Other MTS contexts include military systems, such as Navy SEAL teams coordinating with Army commando teams (McChrystal, Collins, Silverman, & Fussell, 2015) or paramilitary MTSs, such as disaster response and humanitarian aid (e.g., Hurricane Andrew and Hurricane Katrina responders; DeChurch et al., 2011). Medicine (e.g., cancer care) and cybersecurity (network monitoring teams working with threat intelligence teams; Zaccaro, Dalal, Tetrick, & Steinke, 2016) are other areas that depend on MTS structures.

At first glance, the easiest way to categorize the task environments for these different contexts is to simply label them as "complex." Indeed, this is a common phrase in the MTS literature (Mathieu, 2012). However, our review and synthesis of extant research revealed more specificity with regard to the task environments that are well suited for the use of MTS structures, with their aforementioned benefits of specialization and flexibility. We identified at least four key features of the complex task environments in which MTSs are often leveraged (Lesson 1).

First, complex task environments are by their nature ambiguous; that is, there may not necessarily be a "right" way to address a given challenge or task or even any clarity as to what might be a definitively wrong way to address the task (Thompson, 1967). For example, Edmondson and Harvey (2017) describe a system that temporarily joined together to rescue the 33 miners who were trapped in a copper mine in Chile in August 2010. Although there was an overarching rescue goal, there was no clear "best" way to accomplish this goal. As a result, achieving the overarching objective required coordinated efforts across multiple, specialized teams, including NASA, the Chilean Navy, and a Chilean Special Operations group, to break down the ambiguity into manageable actions. Similarly, illnesses such as cancer may be ambiguous in terms of the best route of care, requiring teams that are specialized yet flexible enough to incorporate new ideas that may better address ambiguous results.

Second, complex environments are multifaceted, and multiple layers may need to be unraveled in order to understand how to best address the problem at hand (Baccarini, 1996). Indeed, "complexity" is often used to refer to systems made up of many varied, interrelated parts. For example, this multifaceted or multilayered aspect is observed in situations such as disaster response teams that must decide how to rescue those in peril while operating in a volatile physical environment (DeChurch et al., 2011). As the number of factors to be accounted for increase, both in terms of their amount and variety, the need for flexibility, becomes that much more important.

Third, complex environments are inherently dynamic, in that they are highly likely to experience flux or change on a regular basis (Luciano, DeChurch, & Mathieu, 2015). For example, determining how to keep a car accident victim alive while also trying to remove him safely from a car that may erupt in flames is a very fluid situation, as any of the factors at play can change at any point in time (Mathieu et al., 2001). Other MTSs may experience less extreme environmental change or may even be able to anticipate periods of high or low change, such as in more routine surgical settings with experienced teams working together (Weaver, 2016). However, even in these environments, contingency plans are critical for ensuring that unanticipated change is handled.

Fourth, complex environments that are well-suited to MTS structures tend to have a sense of urgency or time sensitivity, in that goals need to be achieved within a particular duration (DeChurch & Zaccaro, 2010; Standifer, 2012). This sense of urgency may be short- and/or long-lasting. For example, the timing of a space shuttle launch is sensitive in terms of managing numerous tasks simultaneously to ensure the launch occurs at precisely the right time, and then monitoring is rigorously conducted to ensure any crew needs are immediately addressed; similarly, landings often have a need for urgent and precise timing to ensure the crew is safely rescued (Mesmer-Magnus, Carter, Asencio, & DeChurch, 2016; Vessey, 2014).

Lesson 2: MTS Structures Support the Specialization and Flexibility Needed to Tackle Important Problems in Ambiguous, Multifaceted, Dynamic, and Time-Sensitive Environments

Our second lesson highlights two inherent benefits of organizing work into MTS structures—specialization and flexibility. These two benefits allow MTSs to tackle the types of important problems that appear in ambiguous, multifaceted, dynamic, and time-sensitive environments. First, MTSs are characterized by "multilevel goal hierarchies," meaning that their component teams pursue proximal, lower order goals that, in turn, contribute to the achievement of one or more overarching, distal goals (Mathieu et al., 2001). Accordingly, MTS structures offer benefits beyond stand-alone teams by virtue of their specialization, or their ability to tackle complex goals through the development and execution of subgoals.

Thompson (1967) notes that many organizational challenges are beyond the scope of intragroup activities, and instead require various types of interdependent processes to span the boundaries of multiple group or teams. For example, organizations often leverage pooled forms of interdependence across groups, such as when separate departments or units contribute discrete portions of a greater whole. Traditional assembly-line organizations epitomize sequential forms of interdependence across subgroups as product assembly tasks are passed sequentially from one group to the next. MTSs—like departments and assembly lines—allow complex tasks to be broken down into more manageable subtasks, thus offering benefits in the form of specialization.

However, MTSs also differ from traditional departmentalized or assembly-line structures, in that MTS superordinate goals often require more intensive reciprocal forms of interdependence between teams, such that outputs of each component need to become the inputs for each other team in an iterative fashion. To meet the demands of complex tasks requiring reciprocal forms of interdependence between teams, members of different component teams need to interact through mutual adjustment processes, such as the direct transmission of information and feedback between members of different teams (Thompson, 1967). Mutual adjustment processes between teams allow MTSs to rapidly and flexibly integrate and the contributions of different teams.

Thus, organizing work into MTSs offers specialization in the form of discrete subgoals tackled by individual teams as well as flexibility and integration in the form of mutual adjustment processes that span the boundaries of different teams. Moreover, many MTSs can be flexibly adapted in response to changing circumstances. For example, component teams from different backgrounds and areas of expertise can often be added, removed, or adapted as needed to best support the overarching goal(s). In fact, some MTSs, such as certain disaster response or cybersecurity systems (Zaccaro et al., 2016), reflect ad hoc (i.e., temporary) systems that span the boundaries of multiple organizations (i.e., “external MTSs”). The specialized, yet flexible, work design is a benefit of MTSs above and beyond traditional, more rigid organizational structures, which may not have the luxury of supporting rapid adaptation and learning across teams or the reassignment of goals and the reorganization of system structure.

In summary, we find that MTS structures—with their capacity to accomplish superordinate goals through both specialization as well as flexible and iterative problem solving across teams—are well suited to complex task environments that are ambiguous, multifaceted, dynamic, and time sensitive. Our identification of these four conditions is meant to be a starting point for understanding the contexts that are best suited to the use of MTS structures, not an exhaustive list. Notably, however, these four task demands are increasingly prevalent as we face complex 21st-century challenges. Thus, the ability of MTSs to leverage specialization and flexibility to solve problems represents the essential rationale for understanding teamwork situated in MTSs.

Question 2: What Key Phenomena Impact Collaboration Effectiveness in MTSs?

MTS researchers have leveraged and extended foundational theoretical models used to understand the functioning of single teams to understand the phenomena that impact collaboration effectiveness in MTS contexts (see Figure 2). However, extant MTS research reveals that in addition to the teamwork processes connecting component team members to one another, the processes that span the boundaries of component different teams are critical to the success of MTSs; no matter how effectively teams are functioning internally, the system will not achieve its superordinate goals without teams working together (Marks, DeChurch, Mathieu, Panzer, & Alonso, 2005). Thus, our third lesson emphasizes that the way we think about teamwork needs to shift when moving from “teamwork within a team” to “teamwork across a system” (Lesson 3). Moreover, we find that even with shared goals, features of MTSs and their embedding environments often pose barriers to collaboration, particularly between component teams (Lesson 4).

Lesson 3: The Way We Think About Teamwork Phenomena Needs to Shift When Moving From “Teamwork Within a Team” to “Teamwork Across an MTS”

As suggested in Figure 2, teamwork processes and psychological states within and between teams are essential building blocks of MTS functioning (DeChurch & Mathieu, 2009). The teamwork phenomena that contribute to team effectiveness—such as members’ thoughts, feelings, behaviors, and motivations in relation to one another and the group as a whole (e.g., Kozlowski & Ilgen, 2006; Salas, Shuffler, Thayer, Bedwell, & Lazzara, 2015)—are often similar to the phenomena that have been the main focus of research on MTS effectiveness. However, given the need for boundary spanning in MTSs, we find that the way we think about teamwork must shift when moving from “working in a team” to “teamwork across an MTS.”

In their recent review of MTS research, Shuffler, Jiménez-Rodríguez, and Kramer (2015) highlighted a number of phenomena that represent extensions of the teamwork literature to MTS contexts that positively influence both team and MTS effectiveness. For example, leadership and coordination are important behavioral processes that, if structured appropriately, can enhance both team and MTS performance (Davison, Hollenbeck, Barnes, Sleesman, & Ilgen, 2012; DeChurch & Marks, 2006). Creating a sense of belonging across the system through cohesion and a shared identity among MTS members can help ensure effective team and MTS functioning, (DeCostanza, DiRosa, Jimenez-Rodriguez, & Cianciolo, 2014; DiRosa, 2013). Studies of knowledge sharing and the development of shared understanding in military (Burke, Shuffler, Heyne, Salas, & Ruark, 2015) and emergency response systems (Healey, Hodgkinson, & Teo, 2009) suggest that shared mental models are relevant to both team and system performance.

In addition to requiring extensions to team theory, the multilevel structure of MTS contexts can also mean that the nature of the most critical teamwork phenomena may differ when shifting from teams to systems, with implications for both the team and the system. For example, in single teams, it is expected that team members need to share a common understanding of the task and the ways in which individual team members need to interact with one another to accomplish team goals (Cannon-Bowers & Salas, 2001). When teams are situated in MTSs, however, members' shared cognitions must move beyond "team" mental models to incorporate the ways in which entire teams need to interact to accomplish superordinate goals (i.e., interteam interaction mental models; Murase, Carter, DeChurch, & Marks, 2014).

Further, MTS research suggests a need for awareness in research and practice in terms of how processes and states may operate in different ways in teams versus systems. For example, an accumulating body of evidence suggests that phenomena shown to benefit team performance can sometimes have the opposite effect for overall system performance (Shuffler et al., 2015). Sometimes what "pushes" a single team in the right direction toward effective team functioning may also be what "pulls" apart functioning between teams in MTSs, or vice versa. For instance, whereas building strong teams characterized by members who experience strong feelings of cohesion, potency, and identification with their team can benefit team goal achievement (Beal, Cohen, Burke, & McLendon, 2003), strong teams in MTSs may lead to competition and conflict between teams (Lanaj, Hollenbeck, Ilgen, Barnes, & Harmon, 2013).

DeChurch and Zaccaro (2013) refer to such phenomena with differing effects at team and system levels as "countervailing" forces.

Countervailing forces have been a primary focus of empirical MTS research over the past decade. For example, Lanaj and colleagues (2013) explored the countervailing effects of empowering component teams with the responsibility for developing plans for the system—an intervention that evidence shows can benefit team performance (D'Innocenzo, Mathieu, & Kukenberger, 2016). However, results showed that when component teams with lower levels of formal power were empowered to generate plans for the system, it led to overly risky decisions and decrements in coordination and performance—hurting the system instead of helping. This can also be true for teams as well, in terms of what may be best for the system could actually go against what we know is good for the team. For example, findings such as those from Lanaj et al. (2013) as well as Davison and colleagues (2012) seem to suggest that less empowered and internally coordinated component teams that are embedded in well-coordinated and integrated MTSs may actually be more appropriate for achieving system goals. However, as this goes against our traditional understanding of what makes for an effective team, it is important to identify how to best balance these team and system phenomena so that both are effective.

In summary, the foundation of MTS collaboration is teamwork—the affective (e.g., trust, cohesion) and cognitive (e.g., shared mental models) psychological states and behavioral processes (e.g., coordination, leadership) that have proven necessary for team performance are also relevant in MTS contexts. However, we find that the nature of the teamwork processes and states that are most critical to MTS effectiveness often shifts when moving from teams to MTSs, with more complex, and sometimes countervailing, relationships arising. Our next lesson delves deeper into the challenges involved in facilitating these processes and states across systems.

Lesson 4: Even with Shared Goals, Features of MTSs and Their Embedding Environments Can Create Barriers for Collaboration Across Teams

MTSs represent a specific type of intergroup social context (Tajfel & Turner, 1979) whose overarching goals often serve as a binding force among teams. However, the constituent members and teams comprising MTSs do not always smoothly integrate their efforts effectively. The fourth lesson that emerged through our review and synthesis of extant literature is that barriers to collaboration often stem from features of MTSs themselves and/or the contexts within which they are embedded.

One factor that often presents barriers to collaboration, is a defining feature of these systems—their differentiated teams. In fact, a key paradox of multiteam collaboration is that many of the reasons why multiple teams are needed to tackle large complex problems, such as their diverse skill sets, resources, and perspectives, can also create real and/or psychological divides between the teams that constrain collaboration between teams (Luciano et al., 2015). Such cleavages between teams have contributed to extreme failures in MTS functioning. For example, investigations after the Columbia Space Shuttle disaster cited structural issues such as barriers to communication between teams, a lack of integrated management across program elements, and the emergence of an informal chain of influence that operated outside of the organizational structure as key causes (Columbia Accident Investigation Board, 2003).

When MTS component teams are highly differentiated, the salience of team identities and team boundaries are reinforced, reducing the likelihood that critical relationships—such as trust or shared understanding—will emerge between teams (Luciano et al., 2015). Although empirical evidence suggests that maintaining some degree of differences in opinions and perspectives across different teams can benefit decision making and MTS performance (Lanaj, Foulk, & Hollenbeck, 2017), extreme differentiation among teams in an MTS is likely to be problematic. Members of different and highly differentiated teams may be much less likely to identify with one another, thereby influencing the likelihood they will collaborate in support of superordinate goals (Connaughton, Williams, & Shuffler, 2012). In fact, highlighting differences between teams can sometimes strengthen members' identification with their own teams to a counterproductive level, potentially causing members to lose their sense of individual identity and engage in competitive behaviors in relation to other teams to gain positive recognition from teammates (Turner, Hogg, Oakes, Reicher, & Wetherell, 1987).

Indeed, evidence from agent-based computer simulations of MTSs comprised of highly differentiated teams demonstrates that greater levels of geographic distance and time separation between teams decreases the likelihood that MTS members will influence the ideas and actions of other teams (Sullivan, Lungeanu, DeChurch, & Contractor, 2015). Likewise, Standifer (2012) theorizes that differences or incompatibilities between teams with regard to their subjective views of time, task cycles, or pace of work can severely limit teams' abilities to sequence their actions and interactions effectively. There is a clear need for synchrony in teamwork processes across teams. MTS functioning may suffer, for example, if one component team is engaged in planning processes while another team attempts to complete MTS tasks.

It can be challenging for MTS members to navigate their multiple group identities. However, attempting to merge all members of a MTS into a single "big team" with a single shared identity is unlikely to solve this problem (Carter et al., in press; Hogg, Van Knippenberg, & Rast, 2012). For example, MTS members who lose sight of their differentiated team identities may lose motivation to work on behalf of system goals because they do not feel that their specialized contributions will be identifiable and/or appreciated (Baumeister, Ainsworth, & Vohs, 2016). As a result, attempting to create a single "big team" may increase social loafing tendencies as contributions appear more anonymous.

Another defining feature of MTSs that can present barriers stems from the "multilevel goal hierarchies" that are a hallmark of these systems. Often, empirical studies of multiteam collaboration have assumed that all members are equally committed to achieving superordinate goals—indeed, in theory, MTSs should inherently have aligned and consistent hierarchies to function effectively (Mathieu et al., 2001). In reality, however, the motives of individuals and teams in MTSs are not always well aligned, often as a function of the environmental context (Rico, Hinsz, Burke, & Salas, 2016). When teams prioritize very different goals, it downplays the shared common purpose and results in teams that are not synchronized in their goal pursuits (Rico et al., 2016). In some systems, certain team or individual goals are only tangentially related to, or in conflict with, superordinate goals (Zaccaro et al., 2012). These "mixed motive" goal structures can be cognitively taxing for members and pose challenges to teamwork and collaboration (DeShon, Kozlowski, Schmidt, Milner, & Wiechmann, 2004).

For example, Gerber et al. (2016) describe a medical MTS centered on lung cancer patients enrolled in a research trial for a new immunotherapy regimen. Component teams in this system, including research teams, physician teams, nursing teams, and technician teams, pursued the superordinate goal of identifying the most effective treatment. Additionally, each team pursued one or more team-level goals, which varied in the degree to which they directly supported the superordinate goal (e.g., publishing research findings, data management, ensuring compliance with institutional review boards, increasing the efficiency of treatment, coordinating the demands of all patients in the hospital). Although members sometimes pursued local goals that did not entirely align, the effectiveness of this system needed to be "built on trust and members' willingness to communicate relevant information, coordinate actions, and collaborate to achieve overarching goals" (Gerber et al., 2016, p. 1022).

Finally, the complex nature of the embedding environments MTSs operate within can challenge collaboration. Like small groups (McGrath, Arrow, & Berdahl, 2000) and organizations in general (Katz & Kahn, 1978), MTSs interact with their surrounding environments during task performance, and all MTSs experience some degree of fluctuation or change (i.e., dynamism) with regard to factors such as task demands, interaction patterns, team composition, or members' focus on superordinate goals. Indeed, Mathieu and his colleagues (2001) suggest that a primary function of MTSs is to respond adaptively to complex and dynamic circumstances. In highly dynamic environments, MTSs will need to devote additional resources toward monitoring the environment and integrating environmental changes into decision making (Mathieu et al., 2001). A high degree of dynamism within (e.g., membership changes) and/or external to (e.g., changing task demands) a MTS can destabilize the system, again leading members of different teams to turn toward those they feel most comfortable with (i.e., fellow teammates) for information and advice, limiting the ability of teams to coordinate with other teams (Luciano et al., 2015).

Question 3: What Evidence-Based Best Practices Exist for Facilitating MTS Effectiveness?

Finally, we find that MTS research is accumulating a growing body of work pointing toward certain evidence-based best practices for facilitating MTS effectiveness. Our review revealed three overarching categories of best practice approaches that serve to facilitate MTS success: expanded team training (Lesson 5), process management and work design (Lesson 6), and leadership influence (Lesson 7). Whereas each of these categories has its own evidence base, taken together, these approaches offer a comprehensive approach for developing, sustaining, and improving MTS effectiveness.

Lesson 5: Incorporating Between-Team Elements as Part of Team Training Can Improve Both Team and MTS Performance

The first category of interventions, expanded team training, has long been an integral component of fields like aviation (O'Dea, O'Connor, & Keogh, 2014), health care (Hughes et al., 2016), and the military (Salas, Cooke, & Rosen, 2008), Team training represents a systematic approach to improving teamwork, whereby individuals and teams develop necessary knowledge, skills, and attitudes through specific strategies, delivery methods, and tools proven to enhance team outcomes (Salas, DiazGranados, Weaver, & King, 2008). Meta-analytic evidence demonstrates significant, positive effects of team training for outcomes such as reductions in patient mortality and human errors (Hughes et al., 2016; O'Dea et al., 2014; Salas et al., 2008).

In recent years, large-scale team training programs, such as TEAMSTEPPS for medical team training, and crew resource management for aviation team training, have incorporated training for MTS structures. Guidance on MTS contexts, such as how to best work across multiple specialized health care teams, has been embedded into their foundational training, with positive results (Weaver, 2016). For example, structured debriefing meetings held after MTS performance that help teams to understand their successes and identify opportunities for improvement appear to be a useful tool for MTS contexts (Misasi, Lazzara, & Keebler, 2014).

Such training tools demonstrate that, in order to reduce barriers in MTS contexts, it can be beneficial to prepare potential MTS teams and members by embedding interteam and system-wide elements into traditional team training and other team intervention approaches (Shuffler, Rico, & Salas, 2014). That is, the content and focus of training cannot focus only on developing skills relevant to team functioning; instead, training must also address how to manage functioning between teams. For example, de Vries, Hollenbeck, Davison, Walter, and Van Der Vegt (2016) found that team training enhancing MTS members' functional diversity (i.e., breadth of knowledge about different roles) improved coordination between teams. However, they also showed that creating systems of "functional generalists" can have detrimental effects for MTS performance, in that functional generalists can be less likely to make high-impact contributions to their specialized area of expertise. Such findings imply that team interventions alone are not enough for MTSs if they are not expanded to incorporate between team training.

In an earlier empirical study of MTS functioning, Cobb and Mathieu (2003) highlighted this distinction, finding that team training targeting within team processes improved team performance but did not improve overall system performance. However, training targeting both team and MTS processes demonstrated enhanced outcomes at both levels. Overall, the use of team training in an expanded form is a critical intervention for reducing MTS barriers and facilitating functioning, but only if it accounts for the MTS contextual features that come with working across multiple, distinct teams.

Lesson 6: Attending to MTS Structures and Work Design is an Important Part of Managing the Coordination Needed for Effective MTS Functioning

Research on team effectiveness suggests that team leaders need to "manage the process" in teams (Thompson, 2017), meaning that they should leverage coordination control mechanisms (e.g., routines, meetings, plans, schedules, rules, communications; Okhuysen & Bechky, 2009) to structure how team members' interact with one another. Likewise, those who are responsible for facilitating MTS collaboration need to understand and manage how, and with whom, members of different teams need to behave and interact, paying special attention toward structuring crucial interteam processes in accordance with the demands of interdependencies between teams. For example, Luciano (2017) demonstrated that implementing guidelines and other process interventions that gave hospital component teams clarity, consistency, consequences, and constraints with regard to how they should interact during patient handoffs to other teams significantly enhanced patient outcomes and reduced hospital operating costs.

Evidence suggests that managing the process in MTS contexts involves an understanding of who needs to coordinate directly with whom. For instance, Davison and colleagues (2012) examined coordination patterns in systems comprised of a leadership team and component teams whose contributions are more or less relevant to achieving the MTS superordinate goal. Their findings demonstrated that direct coordination behaviors are most beneficial to system performance when they occur between members of the leadership team and the designated boundary spanners from the teams whose contributions are the most central to the MTS goal. As a result, Davison et al. suggest that dynamic centrality may be a key structural consideration for MTS coordination and leadership, in which different component teams may become more or less central to MTS performance depending on their role in the task at any given time. Without this structure, process conflict is more likely to emerge as roles become less clear, even if there is agreement as to overarching goals. Accordingly, this implies a need for both structure that defines roles and coordination mechanisms and flexibility to adapt as needed to better accommodate MTS and team needs. Along these lines, Rico, Hinsz, Davison, and Salas (2017) offered further guidance as to the forms of coordination that may be most appropriate for systems with different interdependence needs.

Although MTS members may not always have a choice with regard to which superordinate goals need to be accomplished, their motivation to achieve these goals can be enhanced by allowing members to participatively develop work design processes that ensure clarity with regard to roles, responsibilities, and coordination mechanisms (Parker, 2014).

Indeed, people are more motivated when they experience work structures that are compatible with their preferences for getting work done (e.g., autonomy, appropriate degree of interdependence; Hollenbeck, DeRue, & Guzzo, 2004). For example, MTS members could participatively develop multiteam charters that document the norms, processes, roles, and communication protocols of MTS members and teams (Asencio, Carter, DeChurch, Zaccaro, & Fiore, 2012). For MTSs, taking an active part in work design should leverage the autonomy of an MTS structure to ensure that complex goals are broken down and distributed in an appropriate manner both within as well as across teams. Further, the continued assessment of work design can aid in evaluating work flows, something that would have been particularly useful in preventing the errors noted in the earlier Mars Climate Orbiter example. Overall, reviewing the design of work both within and across teams can provide a more accurate means of allocating workloads, balancing roles and responsibilities, and minimizing process losses that may seem minor but could be costly.

Lesson 7: Leadership Influence Is a Powerful Process for MTSs That Must Be Integrated and Managed Across the System to Maximize its Benefits

MTS research has consistently demonstrated that leadership is a crucial force in MTS contexts, in that leadership helps coordination, direct, and motivate people to achieve superordinate goals (Carter & DeChurch, 2014). In particular, evidence suggests that the involvement of a hierarchically situated "leadership" or "integration team" that coordinates the efforts of all component teams in support of superordinate goals can be a highly effective way of structuring MTS processes (Bienefeld & Grote, 2014; Davison et al., 2012; Mathieu, Hollenbeck, van Knippenberg, & Ilgen, 2017; Murase et al., 2014; Zaccaro & DeChurch, 2012). There are very real costs involved in the type of reciprocal interdependence and mutual adjustment processes between teams that typify MTS contexts (e.g., information overload, relationship management). Leadership teams that are trained to facilitate interteam dynamics can help relieve some of these burdens. For example, DeChurch and Marks (2006) show that when MTS leadership teams communicate specific strategies to component teams with regard to interteam coordination and directly intervening to facilitate interteam coordination processes during action phases, interteam coordination and MTS performance are enhanced.

However, leadership influence itself is a key behavioral process that may need to be managed in MTS settings (e.g., by formal leaders, managers). As a phenomenon, leadership is an "enabling process" that creates and maintains the conditions necessary for people to go above and beyond the formal requirements of organizations in pursuit of collective goals (e.g., Katz & Kahn, 1978). Very often, leadership influence is exerted by formal leaders, like managers or CEOs. However, leadership can also emerge informally between those without formal authority over one another (DeRue & Ashford, 2010). Indeed, recent work argues that leadership influence in groups and larger systems is a type of patterned or networked relationship that can arise and evolve among members and can have substantial implications for individual and collective outcomes (Carter, DeChurch, Braun, & Contractor, 2015). Given the importance of leadership for individuals and collective goal accomplishment, managing "who influences whom" is likely to be crucial for achieving superordinate goals.

Opportunities to Advance the Science and Practice of Multiteam System Effectiveness

Taken together, the lessons learned from extant MTS research suggest exciting new perspectives for understanding this context for teamwork and collaboration. The evidence thus far provides fodder for the value of MTSs as a unique and important context, and also presents some challenges that researchers are working to address to maximize MTS effectiveness. However, our critical review of the literature also revealed a need to continue to disentangle the nuances of MTS functioning. In the following, we organize major remaining issues in MTS research into a set of four opportunities for the future.

Opportunity 1: Pay Better Attention to Where MTSs "Live and Operate"

Ilgen (1999) concluded almost two decades ago in *American Psychologist* that research on teams tends to look for generalities across teams. MTS research has tended to make a similar assumption—that evidence from a study of MTS functioning in one context is easily generalized to the next context. However, as Ilgen noted, understanding teamwork requires that researchers pay more attention to the complexities of the specific situations within which it occurs. Likewise, we suggest that a clear opportunity to advance MTS science and practice is to pay more attention to where MTSs "live and operate" and consider the implications of those different contexts for the effectiveness of teamwork phenomena and interventions. Initial theoretical work on MTSs has begun to identify the attributes that shape and distinguish MTSs from one another (Zaccaro et al., 2012) and the environmental and social forces that shape how teamwork operates in these contexts (Luciano et al., 2015), but there is room for more investigation.

For example, one recurrent theme is that the empirical evidence base on MTS functioning consists largely of laboratory studies (Shuffler et al., 2015). We do not aim to criticize the quality or contributions of such studies, as they play an important and necessary role in breaking down the complexities of MTS contexts. However, in comparing case studies and laboratory research findings, Shuffler and colleagues (2015) note that whereas laboratory studies assume homogeneity in the attributes of component teams, "real" MTSs are far more likely to be heterogeneous in terms of their attributes (e.g., old and new teams, large and small, hierarchical and shared leadership). Further, in the time that it takes to design, implement, analyze, and publish research findings from complex laboratory studies, the most important questions needing to be addressed for "real" MTSs may have shifted (Burke, 2014). The more removed researchers are from MTSs in the field, the harder it may be to recognize urgent issues.

We suggest that MTS research can address these issues by combining research in laboratory contexts with findings from qualitative and/or mixed methods studies. Qualitative research affords the advantages of providing a rich perspective on MTSs in real-world contexts as well as serving to identify the unique processes and factors contributing to success or failure from a more grounded-theoretical approach (Mathieu et al., 2017; Shuffler et al., 2015). In fact, the definition of MTSs arose based on the failure of "teams" research to adequately describe what practitioners were experiencing in organizations (Mathieu, 2012). By examining MTSs in their natural settings, researchers could better understand the contexts within which MTSs live and operate, and thus develop interventions that are tailored to real MTS needs and challenges.

Opportunity 2: Clarify Conditions and Core Competencies That Facilitate MTS Functioning

Although initial evidence suggests that MTS interventions such as training, process management, and leadership can facilitate MTS coordination and performance, the need to offer additional practical recommendations for addressing MTS functioning remains. Given the complexities of MTSs, it is not likely that a single intervention alone can improve MTS functioning; instead, interweaving a strategic, systematic set of interventions that encompass elements from organizational development, design science, human resources, and training is likely to help (Shuffler et al., 2014). A comprehensive strategic approach is dependent upon researchers and practitioners taking the opportunity to first define—at multiple levels—the guiding forces that may help direct what efforts and interventions are needed.

First, similar to the efforts of Hackman (2002) to define conditions for teamwork effectiveness, we must more clearly identify the enabling conditions that, when present, positively impact MTS functioning. For teams, five major conditions have been identified as being likely to increase the likelihood of team success: having the need for a team, a compelling direction, enabling structure, supportive context, and competent coaching (Hackman, 2002, 2012). For MTSs, these conditions are also likely to be necessary, yet given the challenges of multilevel goal structures, dynamism, and team differentiation, more conditions are certainly likely. Further exploration of the facilitating conditions could inform the development of a suite of proactive interventions (e.g., expanded team training, structured process tools) as well as interventions to be applied under certain circumstances (i.e., reactive interventions).

To better inform proactive and reactive interventions for MTSs, we highlight the need for researchers to continue to explore the nature of teamwork and collaboration phenomena at different levels of observation. MTS research on countervailing forces has primarily investigated how attitudes, motivation, behaviors, and cognitions that benefit teams can have detrimental consequences for collaboration across component teams in MTSs. However, phenomena previously conceptualized as detrimental to team functioning could also have positive effects for systems under some circumstances. For instance, a certain degree of distrust between teams may benefit MTS functioning, in that teams may be more likely to ensure they have a complete understanding about what other teams are doing and their intentions toward doing so (Lewicki, McAllister, & Bies, 1998). Additionally, there may be phenomena that benefit system performance but are detrimental for individual teams. Focusing too strongly on the shared superordinate goals of the system, for instance, may lead members of component teams to ignore critical team-level objectives (Burke et al., 2015).

A second practical challenge is the lack of clearly defined core competencies for individuals working in MTS contexts (Weaver, 2016). Although researchers have advanced several key taxonomies describing what individuals need to know, think, and do to work within teams (e.g., Salas, Rosen, Burke, & Goodwin, 2009), again, the added complexity of the MTS structure may call for additional specification of core teamwork competencies. For example, individuals who work in MTSs may require greater development of skills related to boundary spanning (i.e., communication between groups) than they typically would in a single team. In addition to leveraging existing teamwork competencies, it is necessary to define those that are unique to MTS contexts.

One way this opportunity can be advanced is through the application of teamwork task analyses and needs assessment methodologies within the MTS context. These tools are often used in team contexts to define the core tasks of a team; the competencies, teamwork processes, and states that are needed to support team tasks; and relevant environmental factors (Arthur, Edwards, Bell, Villado, & Bennett, 2005). For MTSs, task analyses should identify the team- and system-level tasks and the competencies and conditions that support accomplishment of those tasks. Pairing knowledge about MTS tasks and supporting conditions can help practitioners better anticipate and determine when interventions may work for or against teamwork.

Opportunity 3: Focus More Intentionally on How to Best Measure Teamwork Dynamics in MTSs, Particularly in Terms of Leveraging Technology

A third opportunity is to expand our methodological approaches to better represent the dynamics of MTSs. Our review identified a heavy reliance on self-report surveys, aggregated coding observations of interactions in laboratory contexts, and limited repeated measures (e.g., two to three measurements). These approaches are limited in terms of their ability to reveal the richness of multiteam interactions, particularly with regard to how interactions unfold over time in response to changing environmental and situational circumstances (Mathieu, 2012). Thus, we note an opportunity to more intentionally focus on measuring teamwork phenomena in MTSs.

In particular, MTS research can better represent the patterns of attitudes, cognitions, and behaviors that occur within and across teams. Given the complexities of MTSs, conceptualizing phenomena such as trust, teamwork processes, or collective cognition as shared states that are experienced identically by all members is often unrealistic. Conceptualizing and measuring these phenomena using patterned approaches, such as social network analyses may more meaningfully capture the variability of phenomena such as leadership influence or teamwork processes within and across teams (Carter et al., 2015; Crawford & LePine, 2013). Likewise, Shuffler, Kramer, Carter, Thayer, and Rosen (2017) suggest the use of *team state profiles* to reflect patterns of emergent states across MTS component teams. The need to understand patterned phenomena echoes calls in single teams to move beyond averages in terms of how we theorize and measure constructs (e.g., Crawford & LePine, 2013). In MTSs, it seems that this is no longer a suggestion or call but a requirement for appropriately conceptualizing processes and states across levels of analysis.

Another opportunity related to measurement in MTSs is the use of technology to capture, as well as break down, the complexities of MTS dynamics and processes. First, there is an opportunity for researchers to further consider unobtrusive approaches to measuring key constructs, specifically in terms of leveraging "digital traces" of teamwork interactions obtained through e-mail chains or instant messaging systems (DeChurch et al., 2018). Because digital trace data can be captured and reviewed over extended periods of time, system dynamics may be more accurately uncovered than would be possible using more traditional, self-report surveys that are only periodically administered (Burke, 2014; Luciano, Mathieu, Park, & Tannenbaum, 2017).

Further, the realistic limitations of collecting MTS data have led teams researchers to integrate computational modeling approaches from engineering and computer science (Sullivan et al., 2015). We encourage more widespread use of such practices as a pivotal technological opportunity. Given the challenges of collecting data with MTSs in the wild, using technology to simulate different MTS conditions, boundaries, and processes may be a better way to explore these issues and provide more meaningful and clear recommendations for practice. For example, such approaches may be particularly beneficial for modeling contexts such as space exploration MTSs, in which the test subjects are limited (Vessey, 2014). Data can be collected with this limited sample and then utilized to create simulations that test different conditions and even simulate the effects of interventions on MTSs, maximizing resources when the stakes are high.

Opportunity 4: Use MTSs to Understand MTSs—Engage More Interdisciplinary Perspectives in Thinking, Researching, and Living in MTSs

MTS research is shifting the science and practice of teamwork and collaboration in multiple ways. Although the initial defining work surrounding MTSs as a meaningful unit of analysis began with I/O psychologists (Mathieu et al., 2001), researchers in other disciplines—including organizational behavior, human resources management, organizational communications, computer science, and engineering—have rapidly contributed to understanding and advancing the science of

MTSs. However, psychology still has much to offer, including, but also beyond, I/O psychology.

For example, research from human factors psychology examining human–computer interactions in MTS settings suggests that technologies could shape MTS functioning and may need to be adjusted in response to MTS performance demands (Baker & Keebler, 2017). Perspectives from cognitive psychologists could offer crucial guidance regarding how best to conceptualize and study cognition in MTSs, especially in terms of the duality of managing team and MTS cognitions. Future research might leverage neuroimaging or similar methodologies to uncover indicators of social functioning, such neural alignment (e.g., Hasson & Frith, 2016).

Approaches within health psychology could also be applied to understand MTS functioning. For example, research could explore whether the syncing of members' physiological responses (e.g., heart rate, galvanic skin responses) reflects team and MTS physiological compliance and stress responses given that stress is certainly prevalent in many MTS contexts (Elkins et al., 2009). Revisiting social psychological theories of intergroup relations (e.g., Tajfel, 1982) in light of interdependencies between teams may help revitalize social psychological research on teamwork. Finally, the psychological study of personality and individual differences is necessary for understanding how such individuals contribute to collective pursuits and how the embedding contexts of teams and MTSs impacts individuals' functioning and well-being.

Conclusion

Through this review, we have delineated the current state and future of MTS research in the form of seven lessons learned and four opportunities to advance the science and practice of MTS functioning. When goals are complex, with both proximal and distal elements, relying on a single team is not always appropriate (DeChurch & Zaccaro, 2010). Instead, through the well-coordinated efforts of multiple teams, complex goals can be broken down into manageable pieces of a larger puzzle. Leveraging a holistic approach to improving MTSs combining expanded team training, process control mechanisms, and leadership can help ensure MTS component teams shared a sense of purpose and coordinate their actions appropriately in support of superordinate goals. Moreover, the overarching potential to achieve outcomes vital to societal functioning means that MTSs represent a critical embedding context for teamwork and collaboration now and in the future.

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