TEAM DYNAMICS OVER TIME

RESEARCH ON MANAGING GROUPS AND TEAMS

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TEAM DYNAMICS OVER TIME

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TEAM COMPOSITION OVER TIME

Suzanne T. Bell and Neal Outland

ABSTRACT

Purpose − *Team composition research considers how configurations (e.g., team-level diversity) of team members' attributes (e.g., personality, values, demographics) influence important outcomes. Our chapter describes key issues in understanding and effectively managing team composition over time.*

Methodology/approach − *We discuss how context shapes team composition. We review empirical research that examined relationships between team composition, and team processes and emergent properties over multiple time points. We review research that examined how composition can be effectively managed over the lifecycle of a team.*

Findings − *Context shapes the nature of team composition itself (e.g., dynamic composition). To the extent that membership change, fluid boundaries, and multiple team membership are present should be accounted for in research and practice. The research we reviewed indicated no, or fleeting effects for surface-level (e.g., demographics) composition on the development of team processes and emergent properties over time, although there were exceptions. Conversely, deep-level composition affected team processes and emergent properties early in a team's lifespan as well as later. Team composition information can be used in staffing; it can also inform how to best leverage training, leadership, rewards, tasks, and technology to promote team effectiveness.*

Social implications − *Teams are the building blocks of contemporary organizations. Understanding and effectively managing team composition over time can increase the likelihood of team.*

Originality/value − *Our chapter provides novel insights into key issues in understanding and effectively managing team composition over time.*

Keywords: Team composition; staffing; team effectiveness; dynamic composition; emergent states; team dynamics

EFFECTIVE TEAM COMPOSITION OVER TIME

The effectiveness of teams has been of interest to researchers and practitioners alike, and a substantial body of research exists on the topic (Mathieu, Maynard, Rapp, & Gilson, 2008). Team effectiveness models suggest that the right mix of team members is an important enabling condition for team effectiveness (Hackman, 2002). Team composition research considers how the configuration (e.g., team-level diversity) of team members' attributes (e.g., personality, values, demographics) shapes team dynamics and performance (Bell, 2007).

Teams are not static entities: they are shaped by a number of temporal influences (Mathieu, Kukenberger, & D'Innocenzo, 2014). Researchers consistently call for the integration of temporal influences in team effectiveness research in general, and team composition research more specifically (Mathieu, Tannenbaum, Donsbach, & Alliger, 2014; Mohammed, Hamilton, & Lim, 2009). Mathieu and colleagues (2014a) summarize the implications of time for teamwork: time can serve as a historic context within which teams operate, time relates to cyclical phenomena as teams perform different activities in a performance episode, and time can be a developmental marker signaling how teams move through a lifecycle from birth to death. Each of these has implications for understanding and managing team composition.

First, teams operate within a specific context which, among other things, shapes the extent to which their composition is dynamic over time. Organizations increasingly rely on team-based work structures that are frequently reconfigured, have fluid boundaries, and have members that are assigned to multiple teams (Tannenbaum, Mathieu, Salas, & Cohen, 2012). Second, teams engage in recurring cyclical processes over time related to goal accomplishment (Marks, Mathieu, & Zacarro, 2001). Team composition can shape the team processes, emergence processes, and emergent properties, as well as how team processes and emergent properties relate to performance over time. Third, teams move through a lifecycle from birth to death. Team composition can inform team design (e.g., staffing) and management across the

lifecycle (e.g., training, leadership priorities). Indeed, time is important for understanding and managing team composition.

The focus of this chapter is a few key issues related to understanding and managing team composition over time. We briefly describe team composition. Then, we organize our chapter around the implications of time for teamwork as noted by Mathieu et al. (2014a). We discuss how the context shapes team composition with a focus on the three contemporary issues that affect the nature of team composition: membership change, fluid team boundaries, and multiple team membership. Next, we describe empirical research that examined how team composition shapes team processes and emergent properties over time. Finally, we describe how team composition variables can be managed over the lifecycle of a team.

Team Composition

In order to utilize team composition in team design and other interventions (e.g., training), specific attributes (e.g., personality, values, abilities, demographics) need to be identified as well as the specific unit-level configurations (e.g., team-level diversity, average of the strategic core) on the attributes that relate to effectiveness in the specific context (e.g., team performance, time-to-market, sales). Team composition variables can include knowledge, skills, abilities, and other characteristics (KSAOs) of team members. Often the focus of team composition research is on relatively enduring team member characteristics (e.g., demographics, abilities, personality) or knowledge and skill sets that are difficult or time-consuming to train (e.g., professional background). Surface-level composition variables are overt characteristics of a team member that can be reasonably estimated after brief exposure to the team member; examples include age, race, and sex (Bell, 2007; Harrison, Price, & Bell, 1998). Often surface-level composition variables operate through stereotypes, assumptions, or attraction to similar others. The effects of deep-level composition variables emerge as team members interact. Deep-level composition variables are underlying psychological characteristics that shape an individual's affect, thinking, and characteristic patterns of behavior (Bell, 2007); examples include personality traits, values, work styles, and abilities.

In general, deep-level composition variables such as personality traits and values have stronger effects on performance than surface-level variables (Bell, 2007; Bell, Villado, Lukasik, Belau, & Briggs, 2011). Surface-level composition variables often have small or negligible effects; however, their importance can increase in specific circumstances. As examples, surface-level diversity can be related to performance when faultlines (i.e., hypothetical divides between team members based on one or more attributes) are activated (Lau & Murnighan, 1998), or if the broader organizational or industry context brings emphasis to demographic differences (Joshi & Roh, 2009).

With team composition, the combination of characteristics across team members is of interest. In their review and integrative framework, Mathieu and colleagues (2014b) organize the team composition literature into individual-based composition models and team-based composition models as described next. The different unit-level team composition operationalizations (e.g., team mean, diversity) can be understood within these models. Individual-based models focus on the fit between individuals' KSAOs and the positions or roles they will occupy (i.e., traditional personnel-position fit models; Mathieu et al., 2014b). The personnel-position fit model can be extended to include teamwork considerations such as role knowledge or generic teamwork skills (called personnel model with teamwork considerations; Mathieu et al., 2014b). With individual-based composition models, teams are expected to be more effective when they are composed of members with higher levels of advantageous KSAOs. As an example, conscientious individuals are described as hardworking, achievement-oriented, and persevering. A team may be better performing when it is composed of conscientious team members. With individual-based models, team composition is operationalized as the aggregate of individual-level attributes (e.g., team mean conscientiousness).

With team-based composition models, the value of a team member's standing on a characteristic(s) is relative to: (a) other team members' standings on the characteristic(s), or (b) the team member's position in the team. For example, a team may be more cohesive when team members are complementary on an attribute (e.g., one team member higher in dominance and the other team members lower on dominance) or similar on an attribute (e.g., shared values). Team-based composition models include team profile models and relative contribution models. With team profile models, the distribution of attributes across the team is important (Mathieu et al., 2014b). Example operationalizations include team diversity on a specific attribute, or the faultlines that develop across multiple attributes (Lau & Murnighan, 1998). With the relative contribution models, characteristics of some team members are thought to be more important than others because of the formal (e.g., strategic core, see Humphrey, Morgeson, & Mannor, 2009) or informal roles (e.g., network position) the team members occupy. This disproportionate influence is accounted for in the team composition operationalization. For example, a team member's attribute may be weighted by their position in the social network, and then aggregated across the team (Lim, 2004).

In many circumstances, individual and team-based composition models both contribute to the prediction of valued outcomes. As an example, a new product development team may be best positioned for success when team members prefer to work in teams rather than individually, the team is diverse in terms of functional background, and members in key positions (e.g., boundary spanning roles) have the necessary levels on the attributes needed for the role (e.g., self-monitoring). The different models can be combined via an algorithm such as the one provided by Mathieu et al. (2014b). This algorithm can include a

temporal vector to account for changing team composition and outcome relationships over time (Mathieu et al., 2014b). Further, because team composition itself may be dynamic because of membership change, fluid boundaries and multiple team membership, the question becomes to what extent the team has the best combination of member attributes for a particular task or circumstance (Mathieu et al., 2014b).

There are a large number of possible team composition attributes and configurations to consider. In most cases, researchers and practitioners should focus on identifying a few key composition considerations that are important for effectiveness in the specific circumstance. Some team composition considerations are likely to be important for most teams. For example, a highly disagreeable team member may be disruptive to team performance in most organizational circumstances (Bell, 2007). Other key team composition considerations will be highly dependent on the context. For example, self-managing teams with ambiguous leadership structures can thrive when shared leadership emerges (Carson, Tesluk, & Marrone, 2007). Shared leadership is more likely to emerge in teams composed of members that are high on both psychological collectivism and extraversion, or both psychological collectivism and motivation to lead (Chen, 2014).

Analysis of the context within which teams operate and an understanding of the theoretical path through which team composition is expected to relate to valued outcomes can be used to identify important attributes and configurations (Bell & Brown, 2015; Bell, Fisher, Brown, & Mann, 2016). The context can be used to identify important emergent properties (e.g., team cohesion) that contribute to a team's human capital. The context also informs how team composition may be most effectively managed (e.g., through staffing, specific leadership behaviors). Team composition is shaped by the context beyond the temporal aspects discussed here (Johns, 2006); however, in this chapter we focus on a few key issues related to team composition over time. We describe: (a) the temporal context and how it informs our understanding of team composition; (b) research that examined how team composition related to team processes, emergence processes, and emergent properties over time; and (c) the management of team composition over time.

TEAM COMPOSITION AND THE TEMPORAL CONTEXT

The context as it relates to time is important for understanding team composition. First, specific features of the context can affect the availability of time or provide cues regarding the usage of time (Mohammed et al., 2009). The features can be perceived or objective; examples include time pressure, strong temporal norms, deadlines, hours employees are assigned to projects or teams, future orientation of an organizational culture, and the broader cultural temporal context (Mohammed et al., 2009; Schriber & Guteck, 1987). Team diversity related to

perceptions and use of time may have particular significance when the temporal context is salient (Mohammed et al., 2009). Team members from different cultural backgrounds may differ on their values including time orientation (Hofstede, Hofstede, & Minkov, 2010). For example, team members may differ in whether long-term or short-term success is most valued, and apply different meanings to time and deadlines (e.g., tomorrow may mean the next day, or "sometime"). These differences can affect decision-making, and lead to coordination difficulties or misunderstandings if not properly managed. Even within cultures, however, individuals differ in their temporal orientations. Without intervention such as strong temporal leadership, team diversity on individual differences such as pacing style, time urgency, and polychronicity can negatively affect team performance, particularly when team members juggle multiple responsibilities, have tight deadlines, and adapt to changing client demands (Mohammed & Nadkarni, 2011, 2014).

Second, features of the task, social, and physical context that teams encounter can change over time; examples include variable workload, task switching, membership change, and changes in virtuality. Team composition is related to a team's ability to adapt to changing conditions. In a series of lab studies, LePine (2003, 2005) manipulated features of the context (e.g., communication channels deteriorating), and examined how team composition related the team's ability to perform after the change. Compared to other teams, teams composed of members who had higher general mental ability, achievement, and openness to experience, and who had lower dependability adapted their role structures and had better team performance after an unforeseen change in the task context (LePine, 2003). Additional team composition variables were implicated in certain circumstances. For example, when goals were difficult, team composed of members with high performance goal orientation were especially unlikely to adapt to changing conditions (LePine, 2005). In a field study of 50 combat teams in training, Lim (2004) found that team agreeableness (operationalized as a relative contribution model) and team openness to experience (operationalized as a relative contribution model and the team mean) were related to team adaptability.

Third, the context can shape the extent to which team composition is dynamic. Membership change, fluidity of team boundaries, and multi-team membership are possibilities of contemporary teams that create dynamic composition (Tannenbaum et al., 2012). Research related to dynamic composition is emerging, as described next.

Dynamic Composition

Membership change is increasingly common in teams and directly shapes team composition. When membership changes, the composition of the team changes. Membership change can occur during the lifecycle of a team as team members

turnover, are promoted, or reassigned to a different team. Membership change may also occur at the end of a team's lifecycle. Increasingly, organizations rely on temporary teams. Temporary teams come together for a predetermined duration to complete a specified task or set of tasks and then disband (Lundin & Soderholm, 1995). Surgical teams and project teams are typically structured as temporary teams. For temporary teams, team membership change is tied to the end of the team's lifecycle. Membership is reconfigured before a new temporary team begins.

Membership change that occurs during a team's lifecycle can be positive or negative. It can stimulate creativity (Choi & Thompson, 2005) and benefit performance on tasks that require reflection on the team processes used (Arrow & McGrath, 1993); however, membership change can lead to performance decrements as the new configuration coalesces (Lewis, Belliveau, Herndon, & Keller, 2007). Team composition can affect how well the reconfigured team navigates the development phases and utilizes the full capabilities of their team members. In their collective turnover model, Hausknecht and Holwerda (2013) describe how leaver proficiencies, newcomer proficiencies, positional distribution, remaining member proficiencies, and time dispersion of the turnover can predictably influence the productive capacity of a team and its collective performance. Productive capacity refers to the extent to which a team utilizes its human and social capital in a given period (Hausknecht & Holwerda, 2013). Other factors can affect productive capacity such as whether teams reflect on their collective knowledge after membership change (Lewis et al., 2007), or when in the lifecycle the addition or departure of team members occurs (Chandler, Honig, & Wiklund, 2005).

Some team composition research has examined membership change; however, adjacent literatures (e.g., newcomer adaptation) can also be used to guide expectations about how team composition may relate to team performance after membership change. Research to date has primarily focused on demographics and ability-related variables. In regards to newcomers, gender, self-efficacy, and newcomer type (new hire or transfer) were positively related to newcomer performance expectations, and newcomer experience was positively related to team expectations in a sample of IT teams (Chen & Klimoski, 2003). The newcomer and team expectations contributed to differences in newcomer role performance (Chen & Klimoski, 2003). Ultimately, how much the newcomer's role performance influences team performance is likely a function of the importance of the role for the team. A lab study demonstrated that the effect of newcomer general mental ability on team coordination and team performance was a function of whether the membership change was to the strategic core (Summers, Humphrey, & Ferris, 2012). Further, the negative effect of newcomer change was particularly pronounced when the newcomer's general mental ability was low relative to the leaver's general mental ability.

Organizations try to utilize membership change at the end of a team's lifecycle to their strategic advantage. With their defined duration, temporary teams allow

a natural opportunity for organizations to strategically redeploy their human capital. Teams can be reconfigured to meet the demands of a dynamic environment. Yet, as team members are resampled from the larger organizational pool, team members will have varying histories with one another. Team members may make assumptions about how one another will behave in the new team based on factors such as reputation and familiarity. These assumptions can help, hinder, or have no effect on the performance of temporary teams, likely dependent on the duration of the team and the importance of efficiency.

Familiarity can help teams to be more efficient and more quickly utilize the talents of team members. For example, previous familiarity between team members was related to shorter operative times in surgical teams (Xu, Carty, Orgill, Lipsitz, & Duclos, 2013). Familiarity was related to speed-to-market and less development costs in a sample of software development projects (Akgün, Keskin, Cebecioglu, & Dogan, 2015). In another sample of software development projects, team familiarity moderated the relationship between functional background diversity and the outcomes of effort and schedule deviation: diverse teams were better performing when they were more familiar (Huckman & Staats, 2011).

Team member familiarity does not always benefit teams. For example, familiarity can be harmful if team members do not agree on how their roles will transfer into the new team. Status disagreements were significantly and negatively related to coordination, and positively related to task conflict in consulting and accounting teams composed of high familiarity team members (Gardner, 2010). In the same sample, status disagreements were unrelated to coordination for low-familiarity teams. Further, familiarity is only likely to benefit shorter-duration teams; empirical research suggests that the benefits of familiarity wane over time (Harrison, Mohammed, McGrath, Florey, & Vanderstoep, 2003). Long-term teams have time to develop their own history, decreasing the effect of team member familiarity prior to team formation.

In addition to membership change, two other issues faced by contemporary teams create dynamic team composition: fluid membership boundaries and multiple team membership (MTM). Teams may rely on informal or temporary shifts in membership to meet their objectives. As an example, individuals working together on a project may bring in an expert for a month to help with a specific aspect of a team project. These temporary shifts in membership can benefit teams as they allow for a richer set of KSAOs. Short, defined assignments allow experts to contribute to multiple teams. Fluidity in membership, however, can result in a lack of clarity regarding who is on the team. Membership model divergence is disagreement (between team members or between team members and management) regarding who is a member of the team (Mortensen, 2014). Membership model divergence can influence a team's transactive memory system and decrease team performance (Mortensen, 2014). Membership model divergence is more likely when team members spend less time together such as when teams are large, team members are geographically distributed, or when team members are assigned to multiple teams (Mortensen, 2014).

MTM is common, particularly in highly competitive settings that are pressured to produce; examples include information technology, software development, new product development, and consulting (O'Leary, Mortensen, & Woolley, 2011). MTM can present challenges and benefits to individuals, teams, and organizations (Mortensen, Woolley, & O'Leary, 2007). At the team level, MTM can lead to scheduling difficulties. However, it can also provide a learning opportunity for team members and, as mentioned, allows for expertise that may not otherwise be available. Several conditions contribute to increased effectiveness of MTM-based work including: composing teams with members that are better at multitasking (Konig, Buhner, & Murling, 2005), assigning individuals to a moderate number of teams (Bertolotti, Mattarelli, Vignoli, & Macrì, 2015), a high-level of familiarity and trust among team members, an organizational climate that has the information to match projects with individuals' skills, the availability of a system to help "load balance" project assignments (Mortensen et al., 2007), and the proper use of technology. For example, intensive instant messaging is associated with higher performance for teams with low MTM, but is associated with lower performance for teams with high MTM (Bertolotti et al., 2015).

Dynamic team composition is increasingly the reality for organizational teams. Teams may differ on each aspect that contributes to dynamic composition: membership change, fluidity of membership, and MTM. The extent to which the teams in question experience these should be accounted for in the models, methodology, and analytical approaches used. Membership change can be accounted for by measuring team composition at multiple time points (e.g., after membership change) and utilizing appropriate statistical models (e.g., model team composition as time-varying covariate in latent growth modeling or random coefficient modeling; Collins, 2006; Jackson, 2011). The content of models could include leaver and newcomer information. Fluidity of team membership can be accounted for by including the formal or informal role of the team members in relative contribution models. Formal roles could include distinctions such as a core, peripheral (Humphrey et al., 2009), or contributor roles. Contributor roles could be defined as temporary team members who are brought in for their expertise to accomplish an assigned set of tasks within a larger project, but who do not otherwise shape the direction of the project. Informal roles could be captured by mapping the individual's position such as centrality on the social network, or by understanding the specific social or task-related roles that team members adapt, and the importance of an attribute for that role.

In some highly complex and uncertain situations, team reconfiguration, fluid boundaries, and multiple team membership co-vary and result in highly dynamic team composition. A shift in thinking from teams to teaming, or "teamwork on the fly" may be required (Edmondson, 2012). Teams may need to be reconceptualized as interactive assemblies of interdependent relations and activities organized around shifting sets of team members (Humphrey & Aime, 2014). Team composition research and methods will need to evolve to encompass the

reconceptualization. For example, relational aspects of teamwork (e.g., familiarity), the structure of networks rather than defined teams, and the larger ecosystem may need to be modeled depending on the research question.

In sum, understanding and effectively managing team composition over time requires an understanding of the particular circumstance. An analysis of the context can identify key composition issues to consider. For example, a salient temporal context (e.g., deadlines, time pressure) may suggest temporal orientation diversity will be important in the prediction of team performance. A context that requires teams to be adaptive may suggest team general mental ability, conscientiousness, goal orientation, agreeableness, and openness to experience are important considerations. The context also shapes the nature of team composition and the extent to which team composition is dynamic. An important point, however, is that not all teams have dynamic composition. When present, membership change, fluid boundaries, and multiple team membership should be accounted for in research and practice. Understanding and effectively managing team composition over time requires consideration of the context, it also requires an understanding of how team composition relates to team processes and emergent properties over time.

TEAM COMPOSITION, TEAM PROCESSES, AND EMERGENT PROPERTIES OVER TIME

In their recurring phase model of team processes, Marks et al. (2001) suggest that teams perform in temporal cycles of goal-directed activity called performance episodes. As teams cycle through these performance episodes, team members engage in interdependent acts directed toward organizing taskwork to achieve a collective goal, called team processes (Marks et al., 2001). Sometimes their activities are focused on goal accomplishment (e.g., coordinating; called action phase processes). At other times, teams reflect on past performance or plan for future action via transition phase processes (e.g., mission planning; Marks et al., 2001). Throughout performance episodes, teams can be engaged in interpersonal processes such as conflict management, confidence building, and affect management. Emergent properties, or collective characteristics, such as shared cognition emerge from the behaviors, cognitions, and affect of team members (Kozlowski, 2015). Emergence properties are an important part of team human capital (Ployhart & Moliterno, 2011). Team composition can shape team processes, emergent processes, and emergent properties over time.

Team composition relates to team processes in a number of ways. First, team composition can affect the extent to which teams engage in beneficial team processes over time. For example, more knowledgeable teams (e.g., higher team mean on domain-relevant knowledge) were better able to execute transition phase processes and performed better than less knowledgeable teams (Mathieu &

Schulze, 2006). Team composition can also affect interpersonal processes: Teams with more women had more collective emotional intelligence and less relationship conflict (Curşeu, Pluut, Boros, & Meslec, 2015). Second, team composition can affect how team processes relate to team performance. Effectively composed teams will find a path to success even if team processes are not ideal. In Mathieu and Schulze (2006), team knowledge interacted with both interpersonal and transition processes in the prediction of performance over time. Interpersonal processes and performance had a positive slope if teams had high-levels of knowledge (Mathieu & Schulze, 2006). In regards to transition processes, when teams were able to execute transition processes well, they were able to have high performance regardless of team mean knowledge. However, higher task-related knowledge was able to reduce performance losses with poor transition processes (Mathieu & Schulze, 2006). Third, effective team processes can weaken the negative effect of aspects of team diversity on relational outcomes. In a sample of student project teams, better team processes (aggregate leadership, cooperation, and communication) weakened the negative time urgency diversity and relationship conflict link as well as the negative extraversion diversity and relationship conflict link (Mohammed & Angell, 2004). Finally, team composition can affect the extent that other team composition variables relate to team processes. For example, team mean team orientation can reduce the negative gender diversity and relationship conflict link (Mohammed & Angell, 2004). In sum, team composition, team processes, and team performance interact over time.

Team composition can also affect emergent properties over time. Individual-level KSAOs become a valuable unit-level resource in part, because of the emergent properties they develop such as transactive memory systems or team cohesion (Ployhart & Moliterno, 2011). The specific emergent properties important for team human capital will vary some by context; for example, team cohesion may be particularly important when convergence or social support among team members is central to team effectiveness (Bell & Brown, 2015). In general, well composed teams: (a) have, or have access to, the right knowledge and skills to accomplish the team's objectives; (b) are able to combine their efforts by creating and executing adequate performance strategies for accomplishing an interdependent team task, (c) have members that are motivated toward the collective team goal, and (d) feel positively toward one another. Team composition research that examines the emergence process has just begun to emerge (Grand, Braun, Kuljanin, Kozlowski, & Chao, 2016). However, there are a number of studies that examine how team composition relates to team processes or emergent properties across multiple time points within the same study; they are the focus of this section. It should be noted that our review is not intended to be exhaustive: We focus on a few key emergent properties. Other team composition variables and configurations beyond those discussed in this chapter relate to team dynamics and performance.

Teams are often diverse in terms of expertise. Diversity can strengthen a team if members are able to access one another's uniquely held task-related

information. Transactive memory systems (TMS) encompass the knowledge uniquely held by team members with a collective awareness of who knows what (Moreland, Argote, & Krishnan, 1996). The development of TMS is heavily influence by communication (Jackson & Moreland, 2009). Team composition can influence knowledge sharing and communication between team members (Hsu, Wu, & Yeh, 2011; Neumann & Wright, 1999). In 27 service management student teams, team mean conscientiousness was related to TMS earlier in a team's lifespan (week 6 of 16), but not later (week 12 of 16). Team mean agreeableness was related TMS later in a team's lifespan, but not earlier (Guchait, Hamilton, & Hua, 2014).

Teams are well composed when they can develop adequate performance strategies for accomplishing an interdependent team task. Team mental models (TMM) are knowledge structures about the task and priorities, teamwork, and the temporal environment. They facilitate interaction with the surrounding environment and help team members describe, explain, and predict events (Mathieu, Heffner, Goodwin, Salas, & Cannon-Bowers, 2000). Shared TMM can lead to implicit coordination and ultimately higher team performance (Fisher, Bell, Dierdorff, & Belohlav, 2012). TMM can vary in content (e.g., taskwork, teamwork, temporal), and whether they are compared against an expert mental model (TMM accuracy), or shared between team members.

Team composition in terms of ability can influence TMM development quickly. Edwards, Day, Arthur, and Bell (2006) manipulated ability composition by creating dyads that were high-high (HH), high-low (HL), and low-low (LL) on general mental ability, and then examined the effects of ability composition on taskwork TMM over a two-week protocol. Results indicated no differences between the ability composition conditions and taskwork mental model similarity at day 2 of a 10-day protocol. By day 4, HH and HL ability composition had developed more shared taskwork mental models than the LL condition. For team ability composition and TMM accuracy, results indicated significant differences between the HH, HL, and LL conditions at both time 1 and time 2.

Results for team personality composition and shared taskwork TMM were similar to those of TMS. Team mean conscientiousness was related to shared taskwork TMM earlier in a team's lifespan (week 6 of 16) but not later (week 12 of 16 weeks) in student teams engaged in a business simulation. Conversely, team mean agreeableness was related to shared taskwork TMM later in a team's lifespan, but not earlier (Guchait et al., 2014).

Teams need a workable leadership structure to be effective. Increasingly, there is interest in shared leadership, an emergent property in which leadership is distributed across multiple team members and used as a resource for future processes and performance episodes (Carson et al., 2007). In data collected on student project teams, high levels of psychological collectivism were key for shared leadership in later stages (i.e., after a third assigned task) when complemented by high levels of extraversion and motivation to lead (MTL). Specifically, shared leadership emerged the most in teams composed of members

high in psychological collectivism and high in extraversion or MTL. Teams composed of members low in psychological collectivism and high in extraversion or MTL had the least shared leadership. Cohesion and trust co-evolved with shared leadership, and shared leadership predicted collective efficacy (Chen, 2014).

Effective teams have members that are motivated and put foth effort toward the team's collective goal. Teams with higher mean and lower variability on team goal priority (a facet of psychological collectivism) had higher end-state performance in a five-week management simulation (Dierdorff, Bell, & Belohlav, 2011). Team efficacy is an important emergent property related to team motivation. It refers to a team's belief in their capability to perform a particular task and meet the situational demands (Bandura, 1997).

In student project teams, team diversity in terms of race was negatively related to initial ratings of team efficacy taken three weeks into a project; however, the effect was short-lived. Race diversity and team efficacy were unrelated at the end of the team's lifespan (week 7; Goncalo, Polman, & Maslach, 2010). Deep-level composition variables likely have more of an influence on team motivation over time. For example, student project teams composed of members high on implicit theory of learning (e.g., believe that abilities are malleable), set more challenging goals, attributed their performance to effort, developed stronger team efficacy, and had steeper learning trajectories than teams composed of members who believed abilities were fixed (Beckman, Wood, Minbashian, & Tabernero, 2012). Finally, whereas team efficacy is task specific, team potency is the team members' collective belief that the team can be effective across tasks and contexts (Guzzo, Yost, Cambell, & Shea, 1993). Research suggests that cultural (Sosik & Jung, 2002) and individual differences related to collectivism (Jung, Sosik, & Baik, 2002) are related to team potency over time.

Team composition can affect members' attitudes toward one another, which can emerge as a team property (e.g., team cohesion, team trust). Team cohesion includes interpersonal attraction, a shared commitment to the task, and a shared importance of being a member of the group (Beal, Cohen, Burke, & McLendon, 2003). Results from research that examined the influence of surface-level diversity on the development of team cohesion over time vary by attribute. Collective emotional intelligence emerged in student teams with higher percentages of women, which in turn increased social cohesion and benefited team effectiveness measured four weeks later (Curşeu et al., 2015). In another sample, ethnic diversity was unrelated to team cohesion across three measurement periods spaced over 15 weeks (Watson, Johnson, & Zgourides, 2002). In terms of deep-level composition, team mean agreeableness was related to increased communication and greater social cohesion, resulting in better performance in student teams surveyed at five time points across four months (Bradley, Baur, Banford, & Postlethwaite, 2013). Effects were inconsistent across virtual, face-to-face, and hybrid teams; only face-to-face teams benefitted from high levels of agreeableness. Finally, the development of a shared identity can moderate team composition and performance relationships. For example,

with higher shared team identification, team performance-prove goal orientation motivated team performance. With lower team identification, team performance-prove goal orientation increased individual performance (Dietz, van Knippenberg, Hirst, & Restubog, 2015).

Team composition in terms of propensity to trust (a subfacet of agreeableness) has been tied to the development of intrateam trust. Intrateam trust is an emergent property rooted in team members' intentions to accept vulnerability based on the positive expectations of their teammates intentions or behaviors (Rousseau, Sitkin, Burt, & Camerer, 1998). Data from a sample of MBA teams interacting over the course of a semester indicated that, while holding team mean propensity to trust constant, greater team propensity to trust diversity triggered a "downward spiral." Teams with greater propensity to trust diversity had "low perceptions of similarity, which led to lower initial intragroup trust, which led to greater relationship conflict, which was negatively related to subsequent intragroup trust, which ultimately decreased group performance" (Ferguson & Peterson, 2015, p. 1020).

In sum, empirical research links team composition to team processes and emergent properties over time. The effects of surface and deep-level composition variables are thought to differ over time. The effects of stereotypes and assumptions made with surface-level variables are thought to weaken over time while deeper-level variables become more important as team members interact. A number of cross-sectional studies support this idea (Harrison et al., 2003). Similarly, the research we reviewed suggested no, or fleeting effects for surface-level composition variables on the development of team processes and emergent properties over time, although there were exceptions (Curşeu et al., 2015). The studies reviewed suggest that deep-level composition variables can affect team processes and emergent properties both early in a team's lifespan as well as later. Effects were dependent on the specific composition variable and operationalization (e.g., mean, diversity), and sometimes varied over time, highlighting the importance of examining team composition, team processes and emergent properties at multiple time points, or theorizing when in the lifecycle team composition is anticipated to have an effect. A better understanding of how team composition relates to team processes and emergent properties over time can be leveraged in the management of teams. In the last section, we describe key considerations in the management of team composition over time.

MANAGING TEAM COMPOSITION OVER TIME

Teams evolve over time. A number of team development models have been forwarded, which specify a team's development process (Gersick, 1991; Kozlowski, Gully, Nason, & Smith, 1999). The content of these models vary, but in general, they specify how a team moves from team formation, to

developing patterns of interactions, to dissolution. Team composition information can be used at team formation to design a better team. Teams can be composed of team members who are most likely to be effective in the circumstance, and teams can be structured (e.g., level of autonomy, reward system) to best support the needs of a team with a given composition. For membership change during the lifecycle of a team, team composition information can be used to determine which team members will best complement the existing team. Team composition can also inform leadership behaviors and other interventions that best support a team with a given composition. Analysis of the context within which the team operates will help guide possible solutions in regards to how team composition will be managed over time (e.g., staffing, training, leadership; Bell, Fisher, et al., 2016).

Team Composition and Team Staffing

Commonly, teams are staffed by a manager, team leader, or other organizational decision-makers. Through interviews with subject matter experts, Mathieu, Tannenbaum, Donsbach, and Alliger (2013) identified team composition decisions practitioners are likely to encounter when forming new teams or staffing existing teams. When forming new teams, composition decisions include single-team formation, multiple team formation, and reconfiguration (Mathieu et al., 2013). Single-team formation decisions focus on composing a team with an optimal combination of members. Multiple team formation decisions have to consider the strategic advantages of various combinations of members across teams (Mathieu et al., 2013). For example, it may be important for all teams to meet a threshold level of performance (e.g., staffing service teams to be at a minimum performance standard), or for a team that is core to an organization's strategy (e.g., an R&D team in an innovative firm) to be prioritized (Bell, Brown, & Weiss, in press). Finally, reconfiguration is the process of assigning or reassigning multiple team members to multiple teams. Reconfiguration can be an effective means of redeploying human capital to meet the demands of a complex and dynamic environment.

For existing teams, composition decisions include single member replacement, multiple member replacement, and new member distribution (Mathieu et al., 2013). Single and multiple member replacement, while different in regard to complexity, involve replacing a team member(s) who has left the team. New member distribution entails consideration of how team members are distributed across multiple teams in addition to member replacement. For existing teams, the overall goal is to identify team members who will supplement or complement the makeup of existing teams. New member distribution can include prioritizing the capabilities of different teams and the aforementioned membership change considerations.

A number of approaches can be used in making the team staffing decisions. Less formally, decisions can be approached by asking a series of questions and using a balanced scorecard method (see Bell & Brown, 2015; Mathieu et al., 2013 for series of questions to ask). More formally, team composition algorithms can be developed and used to understand team and team member compatibility (see Mathieu et al., 2014b for an example). These algorithms can be incorporated into computer-based decision support systems (Malinowski, Weitzel, & Keim, 2008; McHenry, 2015). The algorithms and decision support system can be modified to maximize criteria of interest to the organization (e.g., innovation).

Increasingly, organizational teams may self-organize from a larger network. Team assembly research focuses on how team composition (e.g., often times experience, demographics, and similarity or differences between team members), relationships (e.g., familiarity), task attributes (e.g., difficulty), and the larger ecosystem (e.g., availability of team members) shapes the team formation process (Cooke & Hilton, 2015). Individuals are thought to be motivated to reduce ambiguity in interactions, and choose team members that have predictable interaction patterns and the qualities needed to achieve desired outcomes (Hinds, Carley, Krackhardt, & Wholey, 2000). Empirical research suggests that individuals are more likely to prefer working with someone who is familiar, has a reputation for being competent and persistent, is similar in demographics or competence level, and has a complementary skill set (Guimera, Uzzi, Spiro, & Amaral, 2005; Hinds et al., 2000; Zhu, Huang, & Contractor, 2013).

It should be noted that team formation (whether from the composition or assembly tradition) can be considered an employment-related decision and held to the same legal standards that other selection, placement, promotion, and compensations decisions are held (Civil Rights Act of, 1964, 1991). McReynolds v. Merrill Lynch, Pierce, Fenner, and Smith (2012) provides an interesting example. The company allowed brokers within branches to form their own teams. This "teaming" policy was considered to play a key role in a case centered around racial discrimination. Regardless of who ultimately forms the team (e.g., human resources, manager, team leader, self-assembled), it is prudent for an organization to ensure that staffing or teaming practices are not discriminatory.

Managing Teams of a Specific Composition

Team composition information can be used in staffing; it can also inform how to better manage teams over time. Organizational interventions such as training can help to minimize the risks associated with the team's composition; leadership can help bridges differences and faultlines likely to disrupt team functioning; and rewards, tasks, or technology can be modified to facilitate the

effectiveness of a particular team. Research on management strategies for teams with a particular composition is emerging. To date, most of the research focuses on managing faultlines. Table 1 provides some examples of team design, team training, and leadership strategies that can help maximize the effectiveness of a team with a particular composition.

Table 1. Research That Informs Team Composition Management.

Team Composition	Evidence-Based Management Strategy for Team Composition in Column 1	Citation
Team design		
Faultlines based on job function and race	Crosscut diversity structure, in which racial and job-function subgroup boundaries were crossed, weakened faultlines, enhanced information sharing, and improved decision-making.	Sawyer, Houlette, and Yeagley (2006)
Geographically dispersed teams with national background diversity	Faultlines were stronger when teams were two equally sized subgroups of co-located members that were homogenous in nationality. Faultlines resulted in heightened conflict and reduced trust.	Polzer, Crisp, Jarvenpaa, and Kim, 2006
Teams with members high on extraversion and agreeableness	The teams perform best with cooperative reward structures.	Beersma et al. (2003)
Gender diverse teams	Teams performed better when the reward structure supported a superordinate identity rather than aligned with gender subgroups.	Homan et al. (2008)
Faultlines based on gender and education major	Teams with cross-cut roles performed better when they had a superordinate rather than a subgroup goal; teams with aligned roles were unaffected.	Rico, Sanchez-Manzanares, Antion, and Lau (2012)
Faultlines based on conscientiousness and educational background	Weak faultline teams outperformed strong faultline teams in the high task-autonomy condition. No differences between weak and strong faultline teams were observed in the low task-autonomy condition.	Rico, Molleman, Sánchez-Manzanares, and Van der Vegt (2007)
Training		
Teams with high national diversity and less positive diversity beliefs	Diversity training increased creative performance.	Homan, Buengeler, Eckhoff, van Ginkel, and Voelpel (2015)
Leadership		
Project teams diverse in time urgency and pacing style	Strong temporal leadership (i.e., task-oriented leadership behaviors that synchronize and allocate team temporal resources) helped mitigate the negative effect of temporal diversity on team performance.	Mohammed and Nadkarni (2011)

Table 1. (*Continued*)

Team Composition	Evidence-Based Management Strategy for Team Composition in Column 1	Citation
Teams diverse in work ethic values	Person-oriented leadership exacerbated, while task-oriented leadership ameliorated, the negative relationship between diversity in work ethic values and team conflict	Klein, Knight, Ziegert, Lim, and Saltz (2011)
Ethnically diverse teams	Visionary leadership and team performance in ethnically diverse teams was helpful when leader categorization tendencies were low but could be harmful when leader categorization tendencies are high.	Greer, Homan, Hoogh, and Den Hartog (2012)
Information diverse teams	Teams with high information diversity performed better when they were exposed to pro-diversity belief arguments rather than pro-similarity belief arguments.	Homan, van Knippenberg, van Kleep, and DeDrue (2007)
Top management teams diverse in locus of control	Locus of control diversity was associated with decreased performance when decision-making was decentralized.	Boone and Hendricks (2009)
Teams with external locus of control or internal locus of control	Teams with high average external locus of control performed better when they had a leader; teams with high internal locus of control perform worse with a specific leader.	Boone, Van Olffen, and Van Witteloostuijn (2005)

CONCLUSION

Team composition can have substantial effects on team dynamics and effectiveness. Understanding and managing team composition over time is essential. In this chapter, we necessarily narrow our focus to a few key issues, and in doing so, we do not discuss a number of topics or research relevant to understanding and managing team composition over time (e.g., how individual differences shape which roles team members take on). Our focus is not intended to diminish the importance of this research.

More research on understanding and managing team composition over time is needed; we draw attention to a few areas next. First, teams increasingly have dynamic composition: membership changes, fluid boundaries, and multiple team membership. Research tends to measure team composition at one point in time, and team composition is operationalized as simple

operationalizations such as the team mean. Research is needed that examines which composition variables are important for teams with dynamic composition (e.g., multitasking for those who work as part of multiple teams; Konig et al., 2005). Future research also needs to consider team composition conceptualizations and operationalizations that appropriately represents dynamic team composition. Bell (2007) called for research into novel team composition operationalizations, yet, often researchers default to simple operationalizations such as the team mean. The need for research that explores alternative team composition conceptualizations and operationalizations is especially important for teams with dynamic composition. For example, for teams that are less bounded, team composition operationalizations that account for the relative contributions of core, peripheral, or contributor team members may best predict team performance. Alternatively, team composition operationalizations that weight team member attributes by the team members' position in the network may better represent team composition (see Lim, 2004 for an example). Likewise, the fit of team members to a position in a network rather than to a particular team may be more important for contexts in which team composition is highly dynamic.

Second, future research on how team composition shapes emergence processes and emergent properties will lead to a better understanding of how team composition relates to effectiveness over time. Most of the research that examined team composition, team processes, and emergent properties over time collected data on student project teams. This may influence the effects observed. For example, teams higher on implicit theory of learning had steeper learning trajectories over time (Beckman et al., 2012), but this effect may be unique to a student learning environment. Although we focused on studies that examined team composition, team processes, and emergent properties at multiple time points, the research modeled temporal dynamics to varying degrees. Research that specifically examines the interplay between team composition, team processes, and team performance over time is needed (see Mathieu & Schulze, 2006 for an example). Further, team composition research has focused on emergent properties rather than emergence processes (Kozlowski, 2015). Computational modeling and other methods can be applied to examine how team composition shapes emergence processes (see Grand et al., 2016 for an example).

Finally, team members and managers often may not have the option of composing their team. Mohammed and Nadkarni (2011) provide an example of research that informs how teams with a particular composition (e.g., temporal orientation diversity) may be more effectively managed (e.g., strong temporal leadership). Additional research like this is needed. For example, how can a team mitigate the potential negative consequences of a disagreeable team member? How should teams be structured and rewarded when team members have a low preference for teamwork? While there is still much to explore, we hope our chapter provides insights into a few key issues related to understanding and effectively managing team composition over

time: how the temporal context informs our understanding of team composition; research that has examined the relationships between team composition and team processes, and emergent properties over time; and insights into how team composition may be managed over the lifecycle of the team.

REFERENCES

Akgün, A. E., Keskin, H., Cebecioglu, A. Y., & Dogan, D. (2015). Antecedents and consequences of collective empathy in software development project teams. *Information & Management*, *52*(2), 247−259.

Arrow, H., & McGrath, J. E. (1993). Membership matters how member change and continuity affect small group structure, process, and performance. *Small Group Research*, *24*(3), 334−361.

Bandura, A. (1997). Collective efficacy. In A. Bandura (Ed.), *Self-efficacy: The exercise of control*. New York, NY: Freeman.

Beal, D. J., Cohen, R. R., Burke, M. J., & McLendon, C. L. (2003). Cohesion and performance in groups: A meta-analytic clarification of construct relations. *Journal of Applied Psychology*, *88*(6), 989−1004.

Beckman, N., Wood, R. E., Minbashian, A., & Tabernero, C. (2012). Small group learning do group members' implicit theories of ability make a difference? *Learning and Individual Differences*, *22*, 624−631.

Beersma, B., Hollenbeck, J. R., Humphrey, S. E., Moon, H., Conlon, D. E., & Ilgen, D. R. (2003). Cooperation, competition, and team performance: Toward a contingency approach. *Academy of Management Journal*, *46*(5), 572−590.

Bell, S. T. (2007). Deep-level composition variables as predictors of team performance: A meta-analysis. *Journal of Applied Psychology*, *92*(3), 595−615.

Bell, S. T., & Brown, S. G. (2015). Selecting and composing cohesive teams. In *Team cohesion: Advances in psychological theory, methods and practice* (pp. 181−209). Bingley, UK: Emerald Group Publishing Limited.

Bell, S. T., Brown, S. G., & Weiss, J. (in press). A conceptual framework for leveraging team composition decisions to build human capital. *Human Resource Management Review*.

Bell, S. T., Fisher, D. M., Brown, S. G., & Mann, K. E. (2016). An approach for conducting actionable research with extreme teams. *Journal of Management*, *42*(5), 1−26.

Bell, S. T., Villado, A. J., Lukasik, M. A., Belau, L., & Briggs, A. L. (2011). Getting specific about demographic diversity variable and team performance relationships: A meta-analysis. *Journal of Management*, *37*(3), 709−743.

Bertolotti, F., Mattarelli, E., Vignoli, M., & Macrì, D. M. (2015). Exploring the relationship between multiple team membership and team performance: The role of social networks and collaborative technology. *Research Policy*, *44*(4), 911−924.

Boone, C., & Hendriks, W. (2009). Top management team diversity and firm performance: Moderators of functional-background and locus-of-control diversity. *Management Science*, *55*(2), 165−180.

Boone, C., van Olffen, A., & Van Witteloostuijn, A. (2005). Team locus-of-control composition, leadership structure, information acquisition, and financial performance: A business simulation study. *Academy of Management Journal*, *48*(5), 889−909.

Bradley, B. H., Baur, J. E., Banford, C. G., & Postlethwaite, B. E. (2013). Team players and collective performance: How agreeableness affects team performance over time. *Small Group Research*, *44*(6), 680−711.

Carson, J. B., Tesluk, P. E., & Marrone, J. A. (2007). Shared leadership in teams: An investigation of antecedent conditions and performance. *Academy of Management Journal*, *50*(5), 1217−1234.

Chandler, G. N., Honig, B., & Wiklund, J. (2005). Antecedents, moderators, and performance consequences of membership change in new venture teams. *Journal of Business Venturing*, *20*(5), 705−725.

Chen, G., & Klimoski, R. J. (2003). The impact of expectations on newcomer performance in teams as mediated by work characteristics, social exchanges, and empowerment. *Academy of Management Journal*, *46*(5), 591−607.

Chen, T. R. (2014). *Team composition, emergent states, and shared leadership emergence on project teams: A longitudinal study*. Unpublished doctoral dissertation. George Mason University, Fairfax, VA.

Choi, H. S., & Thompson, L. (2005). Old wine in a new bottle: Impact of membership change on group creativity. *Organizational Behavior and Human Decision Processes*, *98*(2), 121−132.

Civil Rights Act of. (1964). Pub.L. 88-352, 78 Stat. 241 (1964).

Civil Rights Act of. (1991). Pub. L. 102-166, 105 Stat. 1071 (1991).

Collins, L. M. (2006). Analysis of longitudinal data: The integration of theoretical model, temporal design, and statistical model. *Annual Review of Psychology*, *57*, 505−528.

Cooke, N. J., & Hilton, M. L. (Eds.). (2015). *Enhancing the effectiveness of team science*. Washington, DC: The National Academic Press.

Curşeu, P. L., Pluut, H., Boroş, S., & Meslec, N. (2015). The magic of collective emotional intelligence in learning groups: No guys needed for the spell! *British Journal of Psychology*, *106*(2), 217−234.

Dierdorff, E. C., Bell, S. T., & Belohlav, J. A. (2011). The power of "we": Effects of psychological collectivism on team performance over time. *Journal of Applied Psychology*, *96*(2), 247−262.

Dietz, B., van Knippenberg, D., Hirst, G., & Restubog, S. L. D. (2015). Outperforming whom? A multilevel study of performance-prove goal orientation, performance, and the moderating role of shared team identification. *Journal of Applied Psychology*, *100*(6), 1811–1824.

Edmondson, A. C. (2012). Teamwork on the fly. *Harvard Business Review*, *90*(4), 72−80.

Edwards, B. D., Day, E. A., Arthur, W., Jr., & Bell, S. T. (2006). Relationships among team ability composition, team mental models, and team performance. *Journal of Applied Psychology*, *91*(3), 727−736.

Ferguson, A. J., & Peterson, R. S. (2015). Sinking slowly: Diversity in propensity to trust predicts downward trust spirals in small groups. *Journal of Applied Psychology*, *100*(4), 1012−1024.

Fisher, D. M., Bell, S. T., Dierdorff, E. C., & Belohlav, J. A. (2012). Facet personality and surface-level diversity as team mental model antecedents: Implications for implicit coordination. *Journal of Applied Psychology*, *97*(4), 825−841.

Gardner, H. K. (2010). *Disagreement about the team's status hierarchy: An insidious obstacle to coordination and performance*. Harvard Business School Organizational Behavior Unit Working Paper No. 10−113.

Gersick, C. J. (1991). Revolutionary change theories: A multilevel exploration of the punctuated equilibrium paradigm. *Academy of Management Review*, *16*(1), 10–36.

Goncalo, J. A., Polman, E., & Maslach, C. (2010). Can confidence come too soon? Collective efficacy, conflict and group performance over time. *Organizational Behavior and Human Decision Processes*, *113*(1), 13−24.

Grand, J. A., Braun, M. T., Kuljanin, G., Kozlowski, S. W., & Chao, G. T. (2016). The dynamics of team cognition: A process-oriented theory of knowledge emergence in teams. *Journal of Applied Psychology*, *101*(10), 1353−1385.

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

Guchait, P., Hamilton, K., & Hua, N. (2014). Personality predictors of team taskwork understanding and transactive memory systems in service management teams. *International Journal of Contemporary Hospitality Management*, *26*(3), 401−425.

Guimera, R., Uzzi, B., Spiro, J., & Amaral, L. A. N. (2005). Team assembly mechanisms determine collaboration network structure and team performance. *Science*, *308*(5722), 697−702.

Guzzo, R. A., Yost, P. R., Campbell, R. J., & Shea, G. P. (1993). Potency in groups: Articulating a construct. *British Journal of Social Psychology*, *32*, 87−106.

Hackman, J. R. (2002). *Leading teams: Setting the stage for great performances*. Boston, MA: Harvard Business Press.

Harrison, D. A., Mohammed, S., McGrath, J. E., Florey, A. T., & Vanderstoep, S. W. (2003). Time matters in team performance: Effects of member familiarity, entrainment, and task discontinuity on speed and quality. *Personnel Psychology*, *56*(3), 633−669.

Harrison, D. A., Price, K. H., & Bell, M. P. (1998). Beyond relational demography: Time and the effects of surface-and deep-level diversity on work group cohesion. *Academy of Management Journal*, *41*(1), 96−107.

Hausknecht, J. P., & Holwerda, J. A. (2013). When does employee turnover matter? Dynamic member configurations, productive capacity, and collective performance. *Organization Science*, *24*(1), 210−225.

Hinds, P. J., Carley, K. M., Krackhardt, D., & Wholey, D. (2000). Choosing work group members: Balancing similarity, competence, and familiarity. *Organizational Behavior and Human Decision Processes*, *81*(2), 226−251.

Hofstede, G., Hofstede, G. J., & Minkov, M. (2010). *Cultures and organizations: Software of the mind*. New York, NY: McGraw Hill.

Homan, A. C., Buengeler, C., Eckhoff, R. A., van Ginkel, W. P., & Voelpel, S. C. (2015). The interplay of diversity training and diversity beliefs on team creativity in nationality diverse teams. *Journal of Applied Psychology*, *100*(5), 1456−1467.

Homan, A. C., Hollenbeck, J. R., Humphrey, S. E., Van Knippenberg, D., Ilgen, D. R., & Van Kleef, G. A. (2008). Facing differences with an open mind: Openness to experience, salience of intragroup differences, and performance of diverse work groups. *Academy of Management Journal*, *51*(6), 1204−1222.

Homan, A. C., Van Knippenberg, D., Van Kleef, G. A., & De Dreu, C. K. (2007). Bridging faultlines by valuing diversity: Diversity beliefs, information elaboration, and performance in diverse work groups. *Journal of Applied Psychology*, *92*(5), 1189−1199.

Hsu, B. F., Wu, W. L., & Yeh, R. S. (2011). Team personality composition, affective ties and knowledge sharing: A team-level analysis. *International Journal of Technology Management*, *53*(2-4), 331−351.

Huckman, R. S., & Staats, B. R. (2011). Fluid tasks and fluid teams: The impact of diversity in experience and team familiarity on team performance. *Manufacturing & Service Operations Management*, *13*(3), 310−328.

Humphrey, S. E., & Aime, F. (2014). Team microdynamics: Toward an organizing approach to teamwork. *The Academy of Management Annals*, *8*(1), 443−503.

Humphrey, S. E., Morgeson, F. P., & Mannor, M. J. (2009). Developing a theory of the strategic core of teams: A role composition model of team performance. *Journal of Applied Psychology*, *94*(1), 48−61.

Jackson, C. H. (2011). Multi-state models for panel data: The MSM package for R. *Journal of Statistical Software*, *38*(8), 1−29.

Jackson, M., & Moreland, R. L. (2009). Transactive memory in the classroom. *Small Group Research*, *40*(5), 508−534.

Johns, G. (2006). The essential impact of context on organizational behavior. *Academy of Management Review*, *31*(2), 386−408.

Joshi, A., & Roh, H. (2009). The role of context in work team diversity research: A meta-analytic review. *Academy of Management Journal*, *52*(3), 599−627.

Jung, D. I., Sosik, J. J., & Baik, K. B. (2002). Investigating work group characteristics and performance over time: A replication and cross-cultural extension. *Group Dynamics: Theory, Research, and Practice*, *6*(2), 153−171.

Klein, K. J., Knight, A. P., Ziegert, J. C., Lim, B. C., & Saltz, J. L. (2011). When team members' values differ: The moderating role of team leadership. *Organizational Behavior and Human Decision Processes*, *114*(1), 25−36.

Konig, C. J., Buhner, M., & Murling, G. (2005). Working memory, fluid intelligence, and attention are predictors of multitasking performance, but polychronicity and extraversion are not. *Human Performance*, *18*(3), 243−266.

Kozlowski, S. W. (2015). Advancing research on team process dynamics theoretical, methodological, and measurement considerations. *Organizational Psychology Review*, *5*(4), 270−299.

Kozlowski, S. W., Gully, S. M., Nason, E. R., & Smith, E. M. (1999). Developing adaptive teams: A theory of compilation and performance across levels and time. In D.R. Ilgen & E. D. Pulakos (Eds.), *The changing nature of performance: Implications for staffing, motivation, and development* (pp. 240−292).

Lau, D. C., & Murnighan, J. K. (1998). Demographic diversity and faultlines: The compositional dynamics of organizational groups. *Academy of Management Review*, *23*(2), 325−340.

LePine, J. A. (2003). Team adaptation and postchange performance: Effects of team composition in terms of members' cognitive ability and personality. *Journal of Applied Psychology*, *88*(1), 27−39.

LePine, J. A. (2005). Adaptation of teams in response to unforeseen change: Effects of goal difficulty and team composition in terms of cognitive ability and goal orientation. *Journal of Applied Psychology*, *90*(6), 1153−1167.

Lewis, K., Belliveau, M., Herndon, B., & Keller, J. (2007). Group cognition, membership change, and performance: Investigating the benefits and detriments of collective knowledge. *Organizational Behavior and Human Decision Processes*, *103*(2), 159−178.

Lim, B. C. (2004). *Do the leader and member make the team? The role of personality and cognitive ability*. Unpublished doctoral dissertation. University of Maryland, College Park, MD.

Lundin, R. A., & Söderholm, A. (1995). A theory of the temporary organization. *Scandinavian Journal of Management*, *11*(4), 437–455.

Malinowski, J., Weitzel, T., & Keim, T. (2008). Decision support for team staffing: An automated relational recommendation approach. *Decision Support Systems*, *45*, 429−447.

Marks, M. A., Mathieu, J. E., & Zaccaro, S. J. (2001). A temporally based framework and taxonomy of team processes. *Academy of Management Review*, *26*(3), 356−376.

Mathieu, J. E., Heffner, T. S., Goodwin, G. F., Salas, E., & Cannon-Bowers, J. A. (2000). The influence of shared mental models on team process and performance. *Journal of Applied Psychology*, *85*(2), 273−283.

Mathieu, J. E., Kukenberger, M. R., & D'Innocenzo, L. (2014). Time and teams. In A. J. Schipp & Y. Fried (Eds.), *Time and work* (Vol. 2, pp. 6−24). London: Taylor and Francis.

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

Mathieu, J. E., & Schulze, W. (2006). The influence of team knowledge and formal plans on episodic team process-performance relationships. *Academy of Management Journal*, *49*(3), 605−619.

Mathieu, J. E., Tannenbaum, S. I., Donsbach, J. S., & Alliger, G. M. (2013). Achieving optimal team composition for success. In E. Salas, S. Tannenbaum, D. Cohen, & G. Latham (Eds.), *Developing and enhancing high-performance teams: Evidence-based practices and advice*. San Francisco, CA: Jossey-Bass.

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

McHenry, W. K. (2015). Selecting teams: The potential of "the Grid". *Education and Information Technologies*, *20*(1), 183–199.

McReynolds, G. v. Merrill Lynch, Pierce, Fenner, & Smith, Inc. 672 F.3d 482 (N.D. IL., 2012).

Mohammed, S., & Angell, L. C. (2004). Surface-and deep-level diversity in workgroups: Examining the moderating effects of team orientation and team process on relationship conflict. *Journal of Organizational Behavior*, *25*(8), 1015−1039.

Mohammed, S., Hamilton, K., & Lim, A. (2009). The incorporation of time in team research: Past, current, and future. In G. Goodwin, E. Salas, & S. Burke (Eds.), *Team effectiveness in complex organizations: Cross-disciplinary perspectives and approaches* (pp. 321−348). New York, NY: Taylor & Francis.

Mohammed, S., & Nadkarni, S. (2011). Time-based individual differences and team performance: The moderating role of temporal leadership. *Academy of Management Journal*, *54*, 489−508.

Mohammed, S., & Nadkarni, S. (2014). Are we all on the same temporal page? The moderating effects of temporal team cognition on the polychronicity diversity−team performance relationship. *Journal of Applied Psychology*, *99*(3), 404−422.

Moreland, R. L., Argote, L., & Krishnan, R. (1996). Socially shared cognition at work: Transactive memory and group performance. In J. L. Nye & A. M. Bower (Eds.), *What's social about social cognition? Research on socially shared cognition in small groups* (pp. 57−84). Thousand Oaks, CA: Sage.

Mortensen, M. (2014). Constructing the team: The antecedents and effects of membership model divergence. *Organization Science*, *25*(3), 909−931.

Mortensen, M., Woolley, A. W., & O'Leary, M. (2007). Conditions enabling effective multiple team membership. In K. Crowston, S. Sieber, & E. Wynn (Eds.), *Virtuality and virtualization* (pp. 215−228). Boston, MA: Springer.

Neuman, G. A., & Wright, J. (1999). Team effectiveness: Beyond skills and cognitive ability. *Journal of Applied Psychology*, *84*, 276−389.

O'Leary, M. B., Mortensen, M., & Woolley, A. W. (2011). Multiple team membership: A theoretical model of its effects on productivity and learning for individuals and teams. *Academy of Management Review*, *36*(3), 461−478.

Ployhart, R. E., & Moliterno, T. P. (2011). Emergence of the human capital resource: A multilevel model. *Academy of Management Review*, *36*(1), 127−150.

Polzer, J. T., Crisp, C. B., Jarvenpaa, S. L., & Kim, J. W. (2006). Extending the faultline model to geographically dispersed teams: How colocated subgroups can impair group functioning. *Academy of Management Journal*, *49*(4), 679−692.

Rico, R., Molleman, E., Sánchez-Manzanares, M., & Van der Vegt, G. S. (2007). The effects of diversity faultlines and team task autonomy on decision quality and social integration. *Journal of Management*, *33*(1), 111−132.

Rico, R., Sánchez-Manzanares, M., Antino, M., & Lau, D. (2012). Bridging team faultlines by combining task role assignment and goal structure strategies. *Journal of Applied Psychology*, *97*(2), 407−420.

Rousseau, D. M., Sitkin, S. B., Burt, R. S., & Camerer, C. (1998). Not so different after all: A cross-discipline view of trust. *Academy of Management Review*, *23*, 393−404.

Sawyer, J. E., Houlette, M. A., & Yeagley, E. L. (2006). Decision performance and diversity structure: Comparing faultlines in convergent, crosscut, and racially homogenous groups. *Organizational Behavior and Human Decision Processes*, *99*, 1−15.

Schriber, J. B., & Gutek, B. A. (1987). Some time dimensions of work: Measurement of an underlying aspect of organization culture. *Journal of Applied Psychology*, *72*, 642−650.

Sosik, J. J., & Jung, D. I. (2002). Work-group characteristics and performance in collectivistic and individualistic cultures. *Journal of Social Psychology*, *142*(1), 5−23.

Summers, J. K., Humphrey, S. E., & Ferris, G. R. (2012). Team member change, flux in coordination, and performance: Effects of strategic core roles, information transfer, and cognitive ability. *Academy of Management Journal*, *55*(2), 314−338.

Tannenbaum, S. I., Mathieu, J. E., Salas, E., & Cohen, D. (2012). Teams are changing: Are research and practice evolving fast enough? *Industrial and Organizational Psychology*, 5(1), 2−24.

Watson, W. E., Johnson, L., & Zgourides, G. D. (2002). The influence of ethnic diversity on leadership, group process, and performance: An examination of learning teams. *International Journal of Intercultural Relations*, 26(1), 1−16.

Xu, R., Carty, M. J., Orgill, D. P., Lipsitz, S. R., & Duclos, A. (2013). The teaming curve: A longitudinal study of the influence of surgical team familiarity on operative time. *Annals of Surgery*, 258(6), 953−957.

Zhu, M., Huang, Y., & Contractor, N. S. (2013). Motivations for self-assembling into project teams. *Social Networks*, 35(2), 251−264.