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Functional versus dysfunctional team change: Problem diagnosis and structural feedback for self-managed teams

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ABSTRACT

We describe and examine three changes (personnel, process, and structure) that self-managed teams can make to remedy performance problems. We also discuss why self-managed teams may over-emphasize process and (to a lesser extent) personnel changes over structural changes. Furthermore, we describe and test two specific diagnostic feedback interventions aimed at helping teams make functional structural change. Seventy-eight 4-person teams of undergraduate students participated in two trials of a networked laboratory simulation task. All teams were initially structurally misaligned and subsequently received (a) no feedback, (b) one type of feedback only, or (c) both types of feedback. Results confirmed that structurally misaligned teams demonstrated dysfunctional change by changing process more frequently than structure, with detrimental effects for subsequent performance. When teams received the feedback interventions, however, they were more likely to change their structure and thereby improve their performance.

Introduction

Self-managed teams have been described as "one of the most far-reaching innovations" (Alper, Tjosvold, & Law, 1998, p. 34) of work design, due to the relatively broad ability of these teams to make decisions about the way they go about their tasks. This level of autonomy is a hallmark of self-managed teams (Morgeson, 2005), and allows them to rapidly modify their task strategies to accommodate a changing environment or to remedy performance deficiencies. Indeed, many scholars have advocated the use of self-managed teams because of the flexibility afforded by this autonomy (Ancona, 1990; Kozlowski & Bell, 2003). The assumption behind this advocacy of self-managed teams is that because they are "close to the action," self-managed teams can correctly diagnose the cause of their performance deficiencies and carry out appropriate remedies. In other words, self-managed teams should have more information about the cause of the problems they are facing, and thus will make fitting, functional changes that will solve those problems. But some scholars have questioned this assumption, suggesting that self-managed teams sometimes are not sufficiently aware of changes in their environments (Gersick & Hackman, 1990) or make dysfunctional changes in themselves (e.g., Langfred, 2007; Manz & Sims, 1982; Polley, Van Dyne, Beyerlein, & Johnson, 1994).

If self-managed teams do indeed occasionally make dysfunctional changes, a key challenge for teams research is to explore exactly when and how such dysfunctional changes occur. We suggest that one important issue in this regard involves team *structure*: the social architecture of the team that describes how its work is organized and differentiated (Hollenbeck et al., 2002). Functionally structured teams display a highly differentiated division of labor, where each member specializes in a specific part of the team's task. In contrast, divisionally structured teams represent a low level of differentiation of labor, where each member is a generalist and can perform any part of the team's task. Consistent with structural contingency theory (Burns & Stalker, 1961), research has found that functionally structured teams perform best in predictable task environments, whereas divisionally structured teams perform best in unpredictable or rapidly changing task environments (Hollenbeck et al., 2002). This is because functionally structured teams can leverage the efficiency inherent in their differentiation of roles in predictable situations, but this efficiency breaks down when the task is constantly changing. Divisionally structured teams can leverage the flexibility inherent in members' ability to perform any of the team's tasks, which is particularly helpful when it is difficult to predict what will happen next and/or the team needs to respond quickly.

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However, structural adaptation theory (Johnson et al., 2006) suggests that structural *change* is particularly problematic for teams. When team structure is misaligned with the task environment, teams typically perform poorly, but teams often find that making structural changes is difficult, due to their history of working under a different structure. We extend structural adaptation theory by suggesting that when teams are structurally misaligned, they frequently neglect to make adaptive structural changes. Instead, self-managed teams often misdiagnose the nature of their performance deficiencies as being caused by their personnel or processes, and as a result, implement dysfunctional change. Thus, our interest in this study was to examine teams whose structure was misaligned with their task environment, and determine whether they realize that misalignment was the cause for their poor performance.

Emerging work on team adaptation is reaching consensus on the *process* of team change, suggesting that teams engage in various activities after completing tasks, activities that can affect their performance in future tasks (Chen, Thomas, & Wallace, 2005; Marks, Mathieu, & Zaccaro, 2001). For example, some team research has suggested that reflecting on the team's past performance can lead them to make changes that positively affect their future performance (e.g., De Dreu, 2007). To date, however, the *content* of team change has seldom been examined. Thus, we develop a diagnostic list of possible changes that teams can make, arguing that self-managed teams can diagnose the cause of their performance deficiencies as being due to personnel, process, or structure. Then, we describe why self-managed teams are likely to neglect making structural changes. Finally, we examine two feedback interventions that might ameliorate this neglect.

Team change mechanisms

According to attribution theory (Weiner, 1980), people faced with negative or unexpected events attempt to determine both the locus and the controllability of the events, so that they can determine what caused the events and whether they can do anything to address them. Extending this to team settings, if a team is performing poorly, then its members may search for the causes of failure and if they determine that these are controllable, they will implement changes to remedy the problem. As noted by Moreland and Levine (1992), groups are motivated to make these changes the more their real group diverges from what they imagine their ideal group to be. Although there are many potential changes that teams could enact, most of the changes available to self-managed teams can be grouped into three categories: personnel, process, or structure (Campion, Medsker, & Higgs, 1993; Katzell & Guzzo, 1983).

Personnel changes

Personnel changes focus on replacing or repositioning team members. When self-managed teams face performance deficiencies, they often engage in counterfactual thinking, considering "what might have been" had they acted differently (Naquin & Tynan, 2003). This type of thinking frequently leads teams to examine the actions of individual team members, which can lead to attributing blame for the team's deficiency to one or more members (Leary & Forsyth, 1987). The attributions teams make regarding personnel may be legitimate, but they may also "scapegoat" team members who are only partially to blame (Boeker, 1992; Gamson & Scotch, 1964).

LePine and colleagues (Jackson & LePine, 2003; LePine & Van Dyne, 1998) have suggested that when diagnosing personnel problems, teams often focus on the lowest-performing member of the team. When poor team performance is attributed to personnel issues, self-managed teams may remove the member or members who seem responsible for the team's poor performance. If the task can be performed with fewer members, then these members may not be replaced, but in other cases where the task cannot be performed with fewer members, other individuals will be selected to take over their responsibilities. Alternatively (see Moreland, 1999), teams may seek training or bring in outsiders in order to give them the knowledge, skills, and abilities necessary for good team performance. Self-managed teams confronted with a performance deficiency thus have a wide variety of options if they attribute their deficiency to a personnel problem.

Process changes

Process changes focus on modifications of the methods self-managed teams use to perform their tasks. Marks et al. (2001) suggested that team processes can be divided into three categories: transition, action, and interpersonal processes. Transition processes involve reflection on previous performance and planning for future action. These processes include mission analysis (identifying tasks, constraints, and available resources), goal specification (identifying and prioritizing team objectives), and strategy formulation and planning (developing courses of action for accomplishing the team's mission). Action processes involve what teams do when actually working on their tasks, and include monitoring progress toward goals (tracking team progress), systems monitoring (tracking resources and environmental conditions), team monitoring (assisting members in need), and coordination (orchestrating the timing of team member activities). Interpersonal processes involve the way members interact with each other, and include conflict management (preemptively or reactively resolving disagreements), motivation/confidence building (generating collective efficacy and cohesion), and affect management (regulating emotional states). LePine, Piccolo, Jackson, Mathieu, and Saul (2008) meta-analyzed the extensive empirical literature on team processes and found support for these three basic processes.

Structural changes

Structural changes focus on the architecture of the differentiation and integration of labor in the team. Recent teams research has examined numerous aspects of structure, including task interdependence (Langfred, 2007), network structure (Balkundi & Harrison, 2006), centralization (Hollenbeck, Ellis, Humphrey, Garza, & Ilgen, 2011), and reward structures (Beersma et al., 2003). One particularly critical dimension of team structure is the degree of role specialization within teams (Wagner, 2000). In functionally structured teams, work is structured such that members have narrow and specialized roles, whereas in divisionally structured teams, work is structured so that members have broad and general roles. Functionally structuring a team tends to create simple jobs that have complex coordination requirements, whereas divisional structuring creates complex jobs that have simple coordination requirements (Hollenbeck et al., 2002).

Much of the literature on team structure was inspired by structural contingency theory (Burns & Stalker, 1961), which assumes that there is no best way to structure large groups (Pennings, 1992). Recent research on team structure has begun to show how alternative structures interact with the nature of the task to affect team performance (Beersma et al., 2003; DeRue, Hollenbeck, Johnson, Ilgen, & Jundt, 2008; Johnson et al., 2006; Moon et al., 2004). For example, functionally structured teams fit best in predictable environments and display greater decision-making accuracy, whereas divisionally structured teams fit best in unpredictable environments and display greater performance speed

(Johnson et al., 2006). The key point of structural contingency theory (as applied to teams) is that in order to achieve optimal performance, teams must be *structurally aligned* with their task environment. They must accurately diagnose the contingencies in their task environment and structure themselves accordingly. However, correctly identifying the type of change necessary for improving performance is often difficult for self-managed teams. Structural adaptation theory (Johnson et al., 2006) proposes that teams often have difficulty making structural changes, because not all structural shifts are equally adaptive. We suggest that self-managed teams not only have difficulty making certain types of structural changes, but may even fail to consider making structural changes at all.

Change mechanisms: Difficulties in problem diagnosis

Personnel, process, and structural changes in teams can be seen as common "treatments" that teams undertake to remedy their performance deficiencies. However, these three types of change may not be equally salient to self-managed teams when they try to diagnose the reasons for their poor performance. To consider the salience of different changes, we draw from psychological theories of perception, attribution, and group decision-making biases.

First, we suggest that self-managed teams are more likely to *perceive* personnel or processes as causes of their performance deficiencies, rather than structure. According to gestalt theory, people organize their perceptions of objects or situations into groups, distinguishing figures from ground (Koffka, 1922; Kohler, 1959). Drawing from this theory, we contend that when self-managed teams are diagnosing the causes of their performance deficiencies, personnel and process—the people and the actions they do—are the "figure," whereas structure is the "ground." That is, teams naturally view their performance as a function of the members and their behaviors, rather than their underlying structure.

Research stemming from gestalt theory has shown that familiarity is a primary factor that people use to determine which perceptual stimuli are figure and which are ground. People identify objects as being figure instead of ground when they are more familiar with them (see Nelson & Palmer, 2007; Reber, Zimmermann, & Wurtz, 2004). For self-managed teams, structure is typically an unfamiliar concept, whereas the people on the team and the processes by which they carry out their tasks are quite familiar (Levine & Moreland, 1990). Moreover, training does not guarantee that teams will overcome this bias. In their framework of heuristics and biases, Stanovich and West (2008) showed that even if people have the appropriate "mindware," they still may not detect the need to override a heuristic response. In sum, in the context of teams, structure is the static background on which members carry out their actions. As such, it is not likely to be perceived as the figure, and may not be considered as a potential cause of poor performance.

Second, we suggest that self-managed teams are more likely to *attribute* their performance deficiencies to personnel and process causes, rather than to causes associated with structure. Decades of research on the fundamental attribution error has lent support to the notion that people tend to overattribute causes of behavior to persons rather than situations (Jones, 1979). Instead of viewing behavior as being situationally constrained, or caused by both situations and dispositions, people committing the fundamental attribution error attribute the cause of behavior to people's dispositions or choices. Notably, Snyder and Jones (1974) argued that the fundamental attribution error arises from errors in figure–ground perception. Moreover, research on the group attribution error suggests that people more often attribute group decisions to internal than to external factors (Allison & Messick, 1985). Thus, when self-managed teams seek to diagnose the causes of their performance deficiencies, they are unlikely to attribute those deficiencies to situational and structural causes, and will focus instead on the dispositions of the people in the team and their choices to behave as they did.

Research by Naquin and Tynan (2003) supports this contention. They noted that when teams perform poorly, team members engage in efforts to diagnosis the causes of their performance deficiency. This diagnosis process involves the generation of counterfactuals, such that team members imagine how things might have gone if different actions were taken. Naquin and Tynan found that team members were much more likely to generate counterfactuals about the actions of individuals rather than about the team as a whole. An important reason for these biased counterfactuals may be that people find the actions of individuals easier to understand than the systemic actions of groups. In the context of making changes in personnel, process, and structure, Naquin and Tynan's findings suggest that team members are more likely to generate counterfactuals about personnel and process than about team structure.

Third, we suggest that self-managed teams are more likely to *collectively decide* that personnel and processes, rather than structure, are causing their performance deficiencies. Theory and research on collective induction (Laughlin, 1999) suggests that even if some members believe that a group's structure should be changed, they are still unlikely to convince the team to alter its structure. When problems have a correct solution (intellective problems), but it is not possible to clearly demonstrate why that solution is correct, self-managed groups tend to go with the solution proposed by the most group members (Laughlin & Adamopoulos, 1980; Laughlin & Shippy, 1983). Therefore, in the unlikely event that a team member is able to correctly diagnose team structure as misaligned, he or she may still be unlikely to convince the team to alter its structure and thereby improve its performance.

Taken as a whole, this theory and research suggests that self-managed teams are not likely to pursue structural change, even when their underlying problem is structural misalignment. We expect that when self-managed teams attempt to diagnose their performance deficiencies, they will focus more on changes in process and personnel than changes in structure. More formally:

H1. Self-managed teams that are structurally misaligned with their environment are likely to choose to make (a) process or (b) personnel changes with greater frequency than structural changes.

Promoting structural change: Information and feedback

Structurally misaligned teams that choose to change their personnel and process are making dysfunctional decisions, because such changes do not address the true cause for their performance deficiency, and thus are unlikely to improve performance.[1] Therefore, one of our goals was to test diagnostic interventions that might help self-managed teams to make structural changes when their problem is structural misalignment. We considered two such interventions: (a) providing teams with a diagnostic list of possible changes, and (b) providing teams with feedback on structural alignment.

[1] Teams may face multiple performance problems (e.g., structural misalignment and a personnel problem), and thus should implement multiple solutions. We suggest, however, that teams often misdiagnose structural problems, and as a result, implement personnel or process changes when a structural change would be the appropriate solution. It is important to note that teams were allowed to make any or all types of changes they deemed necessary in this study; they were not restricted solely to one type of change.

Providing a diagnostic list of changes

If the failure of teams to make structural changes is due to the fact that structure is not salient, then perhaps simply making teams aware of the types of structural changes that could be made would be enough to help them make such changes. This might occur for two reasons. First, providing self-managed teams with a diagnostic list of possible changes may make them aware of the possibility of structural change when they previously did not realize that such changes could be made. Previous research has shown that providing information about decision biases has been effective in reducing these biases in individuals. For example, failure to recognize regression to the mean was among the numerous decision errors described by Kahneman and Tversky (1973), but that error can be overcome through training in basic statistics (Fong, Krantz, & Nisbett, 1986). This suggests that providing teams with a diagnostic list of structural changes that they could make may help them to avoid the error of neglecting structural change when it is warranted.

Second, providing self-managed teams with a diagnostic list of changes immediately before they make their decision may increase the salience of structural change because of the availability heuristic (Tversky & Kahneman, 1974). According to that heuristic, people tend to use information that is easier to access in memory when making their decisions. If teams typically make process and personnel changes, these types of changes will be more cognitively available when teams are deciding on what type of change to make. Providing teams with a diagnostic list should increase the availability of structural change relative to the other two types of changes.

H2. When self-managed teams that are structurally misaligned with their environment are given a diagnostic list of possible changes, they will be more likely to choose to make a structural change relative to when no diagnostic list of changes is provided.

Providing structural feedback

A second diagnostic intervention that might be helpful is providing feedback regarding the teams' structural alignment. According to Feedback Intervention Theory (Kluger & DeNisi, 1996) external agents (e.g., supervisors, consultants) often provide information regarding some aspect of an individual's task performance, with a view to improving that performance. Appropriate feedback in this case would include information regarding both team structure and performance, information provided by someone who is not a team member. Feedback Intervention Theory indicates that behavior is regulated by comparisons of feedback to goals or standards. Structural feedback, then, should highlight team structure as an important variable in goal attainment, drawing team attention to changing the structure as a specific means of closing the gap between the team's current performance and the team's goal.

Similarly, the Product Measurement and Enhancement System (ProMES) (Pritchard, Harrell, DiazGranados, & Guzman, 2008) proposes that changes can be prompted by creating a set of metrics for providing feedback. In ProMES research, organizations determine both performance objectives and "indicators" that show how well teams are achieving their objectives. For example, an objective of a photocopier repair team might be to repair and maintain photocopiers. Indicators that measure how well the team is achieving this objective could be the number of copies made between service calls and the percentage of repeat service calls. Teams examine discrepancies between the feedback they receive on these indicators and their objectives, and then make decisions on what they will change. Both Feedback Intervention Theory and ProMES research suggest that feedback provided to self-managed teams is likely to focus their attention on closing the gap between current states and goals by making changes highlighted by the feedback. If teams are provided feedback that indicates the extent to which they are structurally misaligned, then, this should increase the likelihood that they will choose to change their structure.

H3. When self-managed teams that are structurally misaligned with their environment are given feedback about their structural alignment, they will be more likely to choose to make a structural change relative to when there is absence of such feedback.

Effect of structural change on team performance

Finally, we suggest that for structurally misaligned teams, the decision on whether to make a structural change predicts subsequent team performance and organizational citizenship behaviors (OCB). If the predictions of structural contingency theory and structural adaptation theory hold true, as prior research in both laboratory and field settings has shown (Drazin & van de Ven, 1985; Hambrick, 1983; Hollenbeck et al., 2002), then making a structural change should improve the team's task performance relative to teams who retain a misaligned structure.

OCB involve activities that are not directly tied to an individuals' task performance, but contribute to the social and psychological environment in which teams operate (Van Dyne, Graham, & Dienesch, 1994). Specific activities usually classified as OCB include helping, cooperating with others, and volunteering to carry out activities that are not directly part of one's job. The relationship between structural fit and OCB is somewhat less clear than the relationship between structural fit and task performance. We suggest two reasons why teams that are structurally aligned will engage in more of these behaviors. First, structural alignment should provide team members with more time to engage in these behaviors, because their resources are allocated in a way that fits their environmental challenges. Second, structural alignment should provide teams with more motivation to engage in OCB. As noted earlier, scapegoating is common in teams, and if teams blame individual members for performance deficiencies, that would strain relationships, leading members to provide less support to each other.

H4. When teams that are structurally misaligned choose to make a structural change, their future (a) task performance and (b) OCB will be superior to teams that remain structurally misaligned.

Method

Research participants and task

Because obtaining a large sample of structurally misaligned self-managed teams that had no other critical differences would be virtually impossible in a field study, we designed and conducted a laboratory experiment to test our hypotheses. Three hundred twelve undergraduate students (187 male, 125 female) in an upper-level management course at a large Midwestern university were arrayed into 78 four-person teams; we kept team size constant because size has been found to affect team performance in certain settings (LePine et al., 2008). Students received course credit for participating in the experiment, and had the opportunity to win $10 (each, or $40 per team) if their team performed well. These prizes were paid at the end of each experimental session. Participants registered for a research session of their choosing, and were randomly assigned to teams and conditions. Subjects were instructed that the purpose of the research was to study team performance on a networked computer task.

Experimental design

Teams were randomly assigned to one of four conditions in a fully crossed 2×2 design. Half of the teams were provided with the diagnostic list of changes after performing at Time 1 and prior to discussion about their performance, and half were not provided with this information. Additionally, half were provided with structural alignment feedback, and half were not. Thus, 1/4 of the teams received no feedback, 1/4 were provided with the diagnostic list only, 1/4 were provided with structural alignment feedback, and 1/4 were provided with both the diagnostic list and structural alignment feedback.

Nature of the task

The study took place in a networked computer research laboratory comprised of three separate rooms where different teams could participate at a given time. In each room, the individual computers were located at different stations, separated by small partitions. Team members were not able to see one another directly when looking at their computer screens, but could directly communicate with one another verbally. Each team participated in two 30-min simulations that were identical across both times and across conditions. The simulation was a modified version of the Distributed Dynamic Decision-making (DDD) simulation developed for the Department of Defense (Miller, Young, Kleinman, & Serfaty, 1998). For a detailed description of that simulation, see Hollenbeck et al. (2002).

The teams' mission in the simulation was to monitor and defend a geographic space, by preventing unfriendly tracks from moving into restricted areas and allowing friendly tracks to freely move about. Tracks were marks on the screen that indicated the movements of vehicles of various sorts. Each team member operated from a separate base that had radar capacities covering only a portion of the geographic area, and there was little overlap in radar coverage across the bases. When tracks first appeared on the screen, their intent (enemy or friendly) was not known. Team members could manually identify tracks to determine whether they were friendly or enemy. Tracks outside their bases' radar ranges were invisible to the team members, but team members could launch vehicles and use them to detect and identify tracks. Four different types of vehicles were used in the simulation: (a) AWACS radar planes, (b), tanks, (c) helicopters, and (d), jets. These vehicles varied in their (a) weapons capacity, (b) duration of operability, (c) speed of movement, and (d) range of vision. At Time 1, each team member had control over one of each of the four types of vehicles, for a total of 16 vehicles (four of each type) across members. Although each vehicle had to be launched (brought under the command of its assigned user) separately, team members could launch and control some or all of their vehicles at any given time.

The allotment of vehicles across members and the geographic differentiation of the bases created a divisional resource allocation structure at Time 1—meaning that each team member could engage and disable any enemy track that encroached on his/her region. This type of structure results in broad, general, and relatively independent roles, as well as lower coordination requirements due to redundancy across the geographic areas (Hollenbeck et al., 2002; Pennings, 1992). These factors promote flexibility and make divisional structures more suitable for environments that are unstable or unpredictable, as shown by Hollenbeck et al. (2002).

However, the tracks that the teams faced in this study were arranged in a predictable format, such that all of the tracks entered the screen in the northwest corner and proceeded across the geographic space to the southwest corner. Thus, the track set was predictable. This type of task environment is not well-suited to a divisional structure. Indeed, Hollenbeck et al. (2002) found that divisionally structured teams operating in predictable task environments performed significantly worse than teams structured functionally (where each member's role was specialized). Functionally structured teams are more appropriate for predictable task environments because they promote efficiency and high levels of expertise (Hollenbeck et al., 2002; Moon et al., 2004). Thus, the use of divisional team structures in this task environment created misalignment.

Manipulations and measures

Providing the diagnostic list of changes

After the first 30-min simulation, teams were asked to make a decision regarding what—if anything—they wished to change before the second 30-min simulation. Teams given the diagnostic list were told:

> I'm going to ask you to make a decision about whether you want to make any changes in this next round. You will have a similar task environment in Time 2 to what you had in Time 1; this means that the tracks will come from generally the same direction and with the same power levels as in Time 1. In the past, we have found that many teams don't want to change anything. They play it in Time 2 the same way they did in Time 1.That is perfectly fine if you choose this option.
>
> Other teams have chosen to change their seating arrangement. Because the DM2 quadrant is overloaded with targets compared to the other quadrants, teams have chosen to have some or all of their team members play Time 2 from a different base because of their unique skills. This is called a personnel change. If you decide to make a personnel change, let me know how you would like to change your seating arrangement.
>
> Still other teams have chosen to change their strategy for playing the game. These teams feel like they have learned something about the simulation in Time 1, and want to approach Time 2 with a different strategy. For example, a team might decide something like, "Everyone will keep their vehicles in their own quadrant." This is called a process change. If you decide to make a process change, let me know what it is so I can write it down.
>
> Finally, other teams have chosen to redistribute the vehicles among the bases. Instead of having one of each type of vehicle at each base, they decide to put more or less of each vehicle at the different bases. This is called a structural change. If you decide to make a structural change, you should decide how you want to allocate the vehicles at each base.
>
> If you choose to change anything in Time 2, you can combine these three types of changes in any way you want. You may choose to change only your structure, only your personnel, only your process, or any combination of the three. Or you may choose to change nothing at all.

Teams not given the diagnostic list were told:

> I'm going to ask you to make a decision about whether you want to make any changes in this next round. You will have a similar task environment in Time 2 to what you had in Time 1; this means that the tracks will come from generally the same direction and with the same power levels as in Time 1. If you have any ideas on how your team might improve its performance in Time 2, now is the time to discuss them.

Structural alignment feedback

Following the example of the Productivity and Enhancement System (Pritchard et al., 2008), we looked for specific behavioral indicators that would be diagnostic of whether any team's structure was aligned with its task environment. Based on data we obtained from previous research (Hollenbeck et al., 2002), we identified the four best behavioral indicators (two related to individual task accomplishment and two related to coordination) of whether teams were structurally aligned. In that study, the researchers used the same simulation we used with the same set of tracks (a predictable task environment), but manipulated structure such that some teams were structured functionally and others were structured divisionally.

The two best behavioral indicators of structural alignment were the number of times team members identified tracks in their quadrants and the speed with which they disabled enemy tracks, and the two best behavioral indicators of coordination were identifying and disabling tracks in teammates' quadrants. Conceptually, these reflect the notion that when teams are structurally misaligned, individual member performance suffers and members engage in inappropriate levels of coordination. Using the Hollenbeck et al. (2002) data, we regressed a binary variable (functionally or divisionally structured) on these behavioral indicators, and recorded the regression weights.

In the current study, we measured these four behavioral indicators for each team at Time 1, centered and multiplied them by the regression weights determined from the previous study, and summed them to create a numerical score that indicated the degree to which a team was structurally aligned.

In essence, this score showed each team the *likelihood* that its structure was aligned with the task environment, based on its own behaviors at Time 1. To ease interpretation, we converted these scores to *T*-scores by multiplying the score by 10 and adding 50. This score was presented to the team using a PowerPoint slide that showed a normal distribution of scores, and indicated where their score was relative to this distribution. For teams who also received the diagnostic list of changes, this slide was shown to them after they received the diagnostic list. Then the teams were told:

> To assist you in making this decision, I have prepared a decision aid for you based on your behaviors in Time 1. We have found that teams do more or less of certain types of behaviors depending upon whether their structure fits their task environment. This slide shows you how much it appears that your structure (how your vehicles were allocated across the bases) in Time 1 fit the task environment. Most teams that fit their task environment score close to 50 on the structure meter. The farther away from 50 (higher or lower), the less likely it is that the team's structure fit the task environment. In a previous study, 60% of the teams that fit their task environment had structure meter scores between 45 and 55, and 95% had scores between 40 and 60. Your team's score for Time 1 was ________.

Change decision

After the first 30-min simulation, the teams were given 10 min to decide what they would like to change (if anything) to improve their performance in the second simulation. The trainer remained in the room to take notes and answer questions, but did not participate in the discussion. Changes required a consensus decision by team members. The trainers coded which combination of the three types of changes the teams chose to make. If teams decided to make a structural change, then the trainer asked them how they would like the vehicles to be configured at each base and indicated which of the available configurations in the software was closest to their decision. If teams decided to make a personnel change, then the trainer recorded how they would like to configure their roles and members changed seats accordingly. If teams decided to make a process change, then the trainer recorded the exact nature of the change (e.g., "Move tanks up to Member 2's quadrant as soon as they are launched;" "Communicate which targets you plan to attack").

Task performance

Performance was captured by the computer simulation as a composite of attack speed (the elapsed time between when an enemy track entered the restricted area and when a team member engaged it), identification speed (the elapsed time between when a track entered the screen and when a team member identified it), friendly fire errors (a count of how often a friendly track was disabled), and missed opportunities (how often a vehicle used to engage the track did not have enough power to disable it). These variables were standardized with a mean of 0 and a standard deviation of 1, and averaged to create the performance measure at Times 1 and 2.

OCB

Organizational citizenship behavior was also a composite of two variables that were captured by the simulation. Help attacks measured how often a team member attacked a track in any other teammate's region. Information sharing measured how often team members communicated the power level of a track to one another. As with the task performance measures, these two variables were also standardized and averaged to create Time 1 and 2 OCB measures.

We followed the debriefing-disclosure process outlined by Marans (1988), where immediate concerns of participants are addressed at the end of each experimental session, and full disclosure of the nature or the research is provided after all of the experimental sessions are complete. This process enables experimenters to maintain the internal validity of their study while providing important information to the participants. Specifically, the debriefing at the end of each session involved assuring participants that they would receive credit for their participation and addressing any specific issues that may have arisen (no serious issues arose in this study). The disclosure at the end of the semester (after participation was complete) involved making a presentation to the class in which these students were enrolled, outlining the purpose and findings of the study.

Results

The correlations and descriptive statistics for all of the variables are displayed in Table 1. Hypothesis 1 suggested that in the absence of any intervention, structurally misaligned teams will choose to make (a) process or (b) personnel changes with greater frequency than structural changes. To test this hypothesis, we examined the choices made by the teams in the control condition (i.e., teams that received neither the diagnostic list nor structural alignment feedback) through paired sample *t*-tests. Results indicated that 84% of these teams chose to make process changes and 16% chose to make personnel changes, whereas only 5% chose to make a structural change. (These numbers do not sum to 100% because teams could make more than one type of change.) The difference between the frequencies of process changes and structural changes was significant ($t = 8.13$, $p < .01$). The difference between the frequencies of personnel changes and structural changes, however, was not significant ($t = 1.00$, *ns*). Thus, Hypothesis 1 was partially supported.

Hypotheses 2 and 3 suggested that teams would be more likely to make structural changes when they were provided the

Table 1
Correlations and descriptive statistics.

	M	*SD*	1	2	3	4	5	6	7	8
1. Diagnostic list	.54	.50								
2. Structural alignment feedback	.47	.50	.00							
3. Structural change	.53	.50	.43**	.41**						
4. Personnel change	.26	.44	.19	.15	.26*					
5. Process change	.70	.46	−.04	−.30**	−.27*	.06				
6. T1 task performance	.00	.63	−.14	−.08	−.06	−.16	−.04			
7. T2 task performance	.00	.62	.05	.18	.23*	−.15	−.27*	.50**		
8. T1 OCB	.00	.82	.04	−.04	−.06	.13	−.26*	−.24*	.04	
9. T2 OCB	.00	.71	.07	−.05	.07	−.14	−.17	−.05	−.15	.57**

Note. N = 78 teams.
* $p < .05$.
** $p < .01$.

diagnostic list of changes and when they were given feedback on their structural alignment. We tested these hypotheses in a binary logistic regression equation. We first created three dummy codes to capture the four manipulated conditions, with the control condition as the comparison condition. We then regressed whether the team made a decision to change structure on these dummy codes. Table 2 displays the results of this equation. Compared to teams in the control condition, teams in each of the three experimental conditions changed their structure more frequently (diagnostic list only: $B = 3.26$, $SE = 1.12$; structural feedback only: $B = 3.25$, $SE = 1.14$; both diagnostic list and structural feedback: $B = 5.03$, $SE = 1.27$; all $p < .01$), supporting Hypotheses 2 and 3. The odds ratios indicate that providing teams with the diagnostic list made them 26 times more likely than teams in the control condition to make a structural change. Similarly, providing teams with structural feedback made them 25.71 times more likely, and providing them with both the diagnostic list and structural feedback made them 153 times more likely to make a structural change.

Examining the change decisions by condition indicated that for teams given the diagnostic list only, 59% chose to make a structural change, 23% chose to make a personnel change, and 82% chose to make a process change. For teams given structural feedback only, 59% chose to make a structural change, 18% chose to make a personnel change, and 59% chose to make a process change. For teams given both the diagnostic list and structural feedback, 89% chose to make a structural change, 45% chose to make a personnel change, and 53% chose to make a process change. These results are illustrated in Fig. 1.

Hypothesis 4 suggested that teams that decided to make a structural change would have superior future task performance and OCB, compared to teams who did not make a structural change. We tested this hypothesis in two linear regression equations, where performance and OCB were the dependent variables and the three possible change decisions were the independent variables (we also controlled for performance at Time 1). The results of this analysis are provided in Table 3. For both dependent variables, structural change was associated with better performance at Time 2 (task performance: $\beta = .25$, $p < .05$; OCB: $\beta = .20$, $p < .05$). Notably, making personnel or process changes actually had negative effects on team outcomes. For example, the effect of process change on task performance was negative and marginally significant ($\beta = -.17$, $p = .09$), suggesting that making a process change may actually harm future task performance. Similarly, the effect of making a personnel change on OCB was negative and significant ($\beta = -.28$, $p < .01$), suggesting that making a personnel change harmed future OCB.

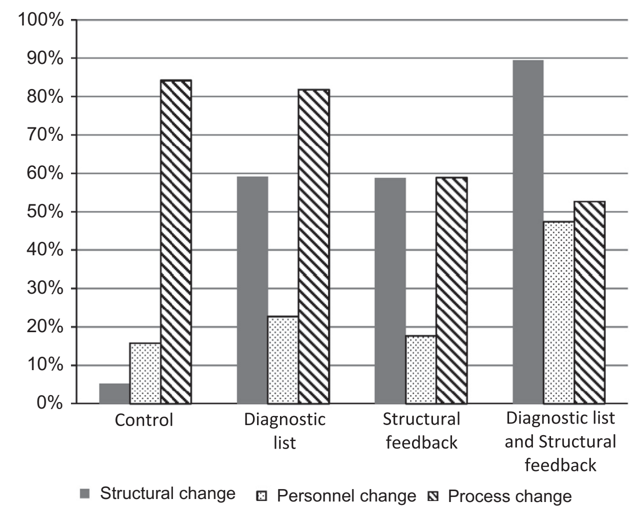

Fig. 1. Probabilities of making changes in each condition.

Discussion

The purpose of this study was to examine the extent to which self-managed teams that are structurally misaligned with their

Table 2
Logistic regression of structural change decisions on experimental manipulations.

	B	*SE*	Odds ratio
Constant	8.65**	2.28	.06
Diagnostic list only	3.26**	1.12	26.00
Structural feedback only	3.25**	1.14	25.71
Diagnostic list and structural feedback	5.03**	1.27	153.00
$\Delta\chi^2$ (3*df*)	33.00**		

Note. N = 78 teams. Coefficients are unstandardized binary logistic regression estimates.
* $p < .05$.
** $p < .01$.

Table 3
Regression of task performance on change decisions.

	Task performance	OCB
Time 1 performance	.49**	.64**
Structural change	.25*	.20*
Personnel change	−.12	−.28*
Process change	−.17†	.07
R^2	.36**	.41**

Note. N = 78 teams. Coefficients are standardized regression estimates.
† $p < .10$.
* $p < .05$.
** $p < .01$.

task environment correctly diagnose the cause of their performance deficiency. Based upon theory and research on problem diagnosis, we tested whether the frequency of changes in personnel and process would be greater than the frequency of changes in structure. Self-managed teams in our study were confronted with a structural misalignment, yet most of them seemed to attribute their performance problems to process issues, rather than to their structure. These teams engaged in dysfunctional changes that hindered their performance relative to teams that became structurally aligned. Thus, we further examined whether diagnostic feedback interventions (Kluger & DeNisi, 1996) would promote decisions to make structural changes.

Two diagnostic interventions made it more likely that the teams would make structural changes. First, when teams were provided with a diagnostic list of possible changes, more than half of them chose to change their structure. This suggests that making structure salient to structurally misaligned self-managed teams increases the likelihood that they will correctly diagnose the cause of their performance deficiencies and make structural changes. Second, when teams were provided with feedback regarding their degree of structural misalignment, more than half of them also chose to change their structure. This suggests that providing appropriate feedback regarding structure increases the likelihood that self-managed teams will choose to change their structure. Notably, the highest incidence of structural change was evidenced by those teams that received both the diagnostic list and feedback regarding their structural alignment. These effects were additive, suggesting that the two interventions were not simply redundant mechanisms for increasing the likelihood of structural change.

An unexpected finding was the negative correlation between decisions to change structure and decisions to change process. This is particularly interesting because neither of the interventions was designed to affect decisions to change process. In the condition where teams received both the diagnostic list and structural feedback, teams made more decisions to change structure than to change process; this was the only condition with that particular pattern of decision making. This is particularly important because decisions to change process actually had a marginally negative effect on future team task performance. The implication is that when self-managed teams misdiagnose their structural problem and instead tinker with their process, they may actually perform worse.

Another unanticipated finding was the general reluctance of the teams to make personnel changes. Although we expected teams to avoid making structural changes, we did not expect them to avoid making personnel changes. As Fig. 1 makes clear, teams in all conditions did not make personnel changes very frequently, and providing the diagnostic list of changes did not promote personnel changes over the control condition even though this was highlighted as one specific option. One explanation for this may be that making personnel changes has the potential for creating conflict (Levine & Moreland, 1990). If members suggest that their teams have personnel problems, they are essentially saying that certain individual members are deficient. Future research should examine this reluctance more fully, particularly in situations when the true explanation for a team-level performance deficiency is indeed a personnel problem, rather than to a structural problem (as was the case here). A general interpretation of our findings, then, could be that when left to their own devices, structurally misaligned teams appear to overwhelmingly diagnose their performance deficiencies as being due to their process, not their personnel or their structure.

However, the reluctance of teams to make personnel changes was positive in our study, because making personnel changes was associated with poorer OCB. This may have been due to the interpersonal pressures associated with making a personnel change; if a member has been identified as the cause for poor team performance, then that might create tension in the team that would reduce future helping behaviors. Similarly, if one member is viewed as a superior performer, who should take on the most difficult tasks in the team, then he or she may be less likely to request help from other team members and other team members may be reluctant to offer help.

Theoretical Implications

Our research contributes to existing theory in four ways. First, we extend structural adaptation theory (Johnson et al., 2006) by identifying a further complication for self-managed teams that are structurally misaligned. Structural adaptation theory suggests that teams often struggle with structural misalignment due to the asymmetric nature of shifting structures. Our study showed that self-managed teams face an additional difficulty, namely recognizing whether they are structurally misaligned and thus choosing to change their structure. We outlined several reasons for why this lack of recognition occurs, based upon limitations in perception, attribution, and team decision-making.

Second, we consolidated a great deal of literature on team change into three overarching categories. This recognition that teams can make changes in personnel, process, or structure simplifies what could be an almost unlimited and confusing number of change options. Although this threefold categorization has been implicitly considered previously (Campion et al., 1993; Katzell & Guzzo, 1983), this is the first time it has been explicitly suggested as encompassing most of the internal causes for poor team performance.

Third, our study offers insights into the dynamics of self-managed teams. Our discussion of problem diagnosis suggests that self-managed teams may not always make accurate diagnoses of their performance deficiencies, leading them to make dysfunctional changes. As such, we contribute to the conversation outlining the potential weaknesses of self-managed teams (Langfred, 2007; Manz & Sims, 1982; Moorhead, Neck, & West, 1998; Polley et al., 1994). Although self-managed teams have many potential benefits, such as increased effort, skill usage, and problem solving (Morgeson, Johnson, Campion, Medsker, & Mumford, 2006), they also have potential limitations. The literature suggests that self-managed teams may have inherent difficulties in decision-making due to reduced interaction in an effort to avoid conflict (Langfred, 2007), the tendency of disruptive events to cause difficulties with both intrateam communication and decision-making (Morgeson, 2005), and (based on the current findings) inherent difficulties in diagnosing the causes of poor performance and consequently make dysfunctional decisions.

Fourth, our research may contribute to the literature on team feedback. Although much is known about how various types of feedback affect the behavior of individuals (e.g., Kluger & DeNisi, 1996; Smither, London, & Reilly, 2005), much less is known about the effects of feedback on groups in general, and self-managed teams in particular (Pritchard et al., 2008). Emerging research suggests that providing team-level feedback (as well as individual-level feedback; Robinson & Weldon, 1993) enables teams to self-regulate their behavior and adjust their effort and strategies accordingly (DeShon, Kozlowski, Schmidt, Milner, & Wiechmann, 2004). Our study supports this notion, suggesting that providing teams with feedback on their degree of structural alignment allows them to self-regulate by making more accurate problem diagnoses.

Practical applications

There are several possible applications of our research to practice. First, the results suggest that structural misalignment is largely invisible to teams, so organizations should seek ways to make it more salient. We developed two such diagnostic interventions, which varied both in their likelihood of producing structural change and in their ease of development. Providing teams with a diagnostic list of possible changes would be an easy mechanism to implement in most organizations, and it significantly increased the likelihood that the teams in our study would choose to make structural changes. Providing teams with feedback about their level of structural alignment would be more difficult to implement, because it would involve identifying and measuring the team's behaviors that are the best indicators of structural misalignment (which likely vary across organizations and industries). Our data suggest that although it may be difficult, providing structural feedback in conjunction with the diagnostic list can be an effective method of causing teams to choose structural change.

Our study also demonstrated the value in providing specific content feedback to teams as they attempt to diagnose and treat the causes of their performance deficiencies. Although there is debate about the value of reflection for teams (see Moreland & McMinn, 2010), some research has found that when teams reflect on their past actions, they can improve their future performance (e.g., De Dreu, 2007). Our study suggests, however, that the content of the reflection may be just as important as the reflection itself. In other words, the benefits of team reflexivity may depend on *what* teams discuss about their past actions. If structurally misaligned teams fail to reflect on their structure, then reflexivity may not be helpful. Indeed, if structural misalignment is a team's fundamental problem, then reflexivity without structural feedback may lead to dysfunctional changes. Thus, we suggest that organizations can benefit from both our research and research on team reflexivity by introducing focused After Action Reviews. When teams complete a task (or a significant phase of a task), they could be required to reflect on their past performance by reviewing our diagnostic list. This might serve to focus their discussion by analyzing the various factors that contributed to their performance, allowing them to diagnose the true causes of their performance deficiencies, and implement appropriate changes.

We also believe that "empowered" teams may not always be fully aware of their empowerment. The boundaries of a team's autonomy can be unclear. Most self-managed teams probably believe that they have the authority to modify their processes and some are likely to believe that they have the authority to change their personnel, but it is unclear whether self-managed teams believe they have the authority to change their structure. Therefore, we suggest that organizations explicitly outline whether structural change (as well as any other type of change) is within a self-managed team's purview when that team is formed. This may make teams more cognizant of their structure from the start, helping them to avoid structural misalignment in the first place.

Finally, according to structural adaptation theory (Johnson et al., 2006), teams sometimes have difficulty changing structures due to asymmetries in the adaptation process. That is, changing structure in one direction (functional to divisional, centralized to decentralized, cooperative rewards to competitive rewards) is easier than changing it in the opposite direction. Johnson et al. (2006) speculated that a more efficient process of aligning structures with environments may be to actually remove a misaligned team and replace it with a different team (whose structure is already aligned appropriately with the environment). Thus, we suggest that it may also behoove organizations to give self-managed teams the ability to request changing tasks if they (a) diagnose that they are structurally misaligned, and (b) are unable to change structures effectively.

Directions for future research

Finally, future research could clearly enhance our understanding of how self-managed teams can improve their own performance. Several avenues of research come to mind. First, the structural feedback we provided in our experiment was specifically designed to give teams an indication of how structurally aligned they were in terms of resource allocation. This is just one dimension of structure, however; future research could examine ways of presenting structural feedback on interdependence or individual member autonomy structure (Langfred, 2007), or on centralization and reward structure (Johnson et al., 2006). In addition, our structural feedback was highly simplified – teams were given a single alignment score in a graphical format. Other methods of presentation may be more or less effective than the method we used, and future research could attempt to determine the most effective method.

Second, the type of structural misalignment in our study required teams to shift from a divisional to a functional structure in order to achieve structural alignment. Would similar effects be found if teams had to shift in the opposite direction (from functional to divisional structure)? Structural adaptation theory (Johnson et al., 2006) holds that shifting from a divisional to a functional structure (as in our study) can be difficult. This likely created a conservative test for our hypothesis related to improved performance for structurally aligned teams. Future research could examine, however, whether detecting structural misalignment is more or less difficult when teams are functionally structured in an unpredictable environment. We suspect that given the right diagnostic intervention, self-managed teams could make this diagnosis equally well, but this is ultimately an empirical question.

Third, all of the teams in our experiment started with a *misaligned* structure, and so changing structure was appropriate. Future research could examine whether teams who start in an *aligned* structure would make structural changes when given a diagnostic list of changes or structural feedback. This may be particularly relevant for teams that are given only a diagnostic list. If making structure salient increases the likelihood that teams will change structure, whether they are structurally misaligned or not, then presenting only the diagnostic list could actually harm future team performance. Hopefully, if teams are given information on what changes they can make (rather than just information about the process of making changes), teams can correctly diagnose the cause of their performance deficiencies and change accordingly.

Fourth, although we studied structure as the cause of performance problems, self-managed teams certainly also often face problems with personnel and process. When this is the case, it would obviously be more functional for teams to make changes that address these causes for their performance deficiencies. Thus, an interesting avenue for future research might involve developing feedback mechanisms that highlight when personnel or process are the team's problem. The aforementioned research by Pritchard and colleagues on the ProMES feedback system (Pritchard et al., 2008) suggests a fruitful way to explore this issue. Moreover, it may be interesting to examine the effects of specific kinds of personnel or process changes. For example, it may be that removing or replacing a team member is more harmful for team performance than is changing that member's role.

Fifth, we note that if a team has multiple problems, (for example, the team is structurally misaligned and has an underperforming member), then it should implement multiple solutions. The optimal sequence of such changes is likely to vary across situations. For example, it may behoove some teams to implement a structural change first, and then place members into the roles that best fit them. In other cases, however, it may be better to remove a disruptive team member first and then implement a structural change. Future research could examine which sequences are best in a given situation.

Sixth, future research could examine whether various decision-making techniques influence team choices of various types of change. We allowed a relatively unstructured format for decision-making, and so teams employed a wide variety of techniques to make their decisions. Various techniques have shown promise in reducing common group decision-making pitfalls. It may be interesting to study whether methods like the Nominal Group Technique or the Delphi Technique (Van de Ven & Delbecq, 1974) affect the degree to which structurally misaligned teams can correctly diagnose the causes for their performance deficiencies, and whether providing a diagnostic list or structural feedback works better or worse using those types of decision-making techniques.

Finally, our study did not explicitly examine team process factors that could influence a teams' willingness or ability to make different types of changes. One factor that seems especially interesting is cohesion. It may be that teams with higher levels of cohesion are less willing to make personnel changes, and therefore are more likely to make other types of changes (Festinger, 1950; Mullen & Copper, 1994). To make a change to personnel, some team member(s) must be singled out for poor performance by other team members, and this may threaten the cohesiveness of the team. In contrast, suggesting or making changes related to processes do not necessarily require individuals to be identified as poor performers. Instead, the focus is on changing the team's actions, and so cohesion is more likely to be maintained. Thus, highly cohesive teams may not critically examine all of the possible causes for their performance deficiencies, and would possibly be even more prone to the bias against structural change.

Limitations

A few characteristics of our experiment may limit its worth. First, for teams that received the diagnostic list, the order in which the possible changes was presented was not balanced (we did not vary the order in which we presented the three types of changes). This could potentially cause some changes to be more salient than others to teams. There are two reasons to believe that this did not have a deleterious effect on our results. First, the presentation of diagnostic list was so short that it is unlikely that one type of change was recalled more than another; on average, it took about 1½–2 min to read this text. Additionally, the order of the changes was reversed when they were reiterated at the end of the text. Second, a comparison of the change decisions across conditions (as found in Fig. 1) argues against some changes being more salient than others. For example, teams in the "Diagnostic list only" condition chose to make process changes just as often as those in the "No information" condition.

Another limitation was the restriction in the types of changes that teams could make. For example, we limited teams to one type of personnel change: assigning team members to different jobs. In real-world contexts, however, teams sometimes have more personnel change options available to them. They may have the autonomy to add, remove, or replace members, or they may be able to arrange additional training for members lacking the requisite knowledge and skills to perform their tasks effectively.

The participants in our experiment also had no prior experience working at this task, so it is uncertain whether teams with more extensive task knowledge would have made different diagnoses and changes. It may be that self-managed teams who have been working on their tasks for longer periods may be able to make more accurate diagnoses of their performance deficiencies.

There were also elements of our experimental task that may have limited our findings. For example, team members in our experiment did not vary in the specific skills that they brought to the team. It may be that teams whose members have more specialized skills are more likely to consider making structural changes, if the change involved becoming functionally structured according to specific member skills. Additionally, the teams in our task focused on their computer screens and communicated via a software messaging system, as well as orally. It could be that teams working on tasks that require more face-to-face interaction would focus more on personnel problems than did the teams in our study.

It is also possible that demand characteristics may have influenced the decisions our teams made. To address this possibility, our instructions were careful to emphasize that the choice was theirs alone to make. Perhaps more importantly, as our data indicate, there was considerable variance in the changes selected by teams, even within conditions. Moreover, if they considered structural feedback to be an instruction, there likely would have been no difference between teams that received only structural feedback (41% of which did not change their structure) and those that received both structural feedback and the diagnostic list (only 11% of which did not change their structure).

Finally, our contribution is limited to self-managed teams that have sufficient autonomy to make changes to their structure (as well as to their personnel and processes), and for whom structural alignment matters for their performance. Not all self-managed teams have the authority to make fundamental changes to their structure; indeed, self-managed teams are rarely delegated complete decision-making authority (Yukl, 2002). Nevertheless, most self-managed teams likely have the necessary autonomy to adjust the degree to which they are divisionally or functionally structured.

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References

Allison, S. T., & Messick, D. M. (1985). The group attribution error. *Journal of Experimental Social Psychology, 21*, 563–579.

Alper, S., Tjosvold, D., & Law, K. S. (1998). Interdependence and controversy in group decision making: Antecedents to effective self-managing teams. *Organizational Behavior and Human Decision Processes, 74*, 33–52.

Ancona, D. G. (1990). Outward bound: Strategies for team survival in an organization. *Academy of Management Journal, 33*, 334–365.

Balkundi, P., & Harrison, D. A. (2006). Ties, leaders, and time in teams: Strong inference about network structure's effects on team viability and performance. *Academy of Management Journal, 49*, 49–68.

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*, 572–590.

Boeker, W. (1992). Power and managerial dismissal: Scapegoating at the top. *Administrative Science Quarterly, 37*, 400–421.

Burns, T., & Stalker, G. M. (1961). *The management of innovation*. London: Tavistock Publications.

Campion, M. A., Medsker, G. J., & Higgs, A. (1993). Relations between work group characteristics and effectiveness: Implications for designing effective work groups. *Personnel Psychology, 46*, 823–850.

Chen, G., Thomas, B., & Wallace, J. (2005). A multilevel examination of the relationships among training outcomes, mediating regulatory processes, and adaptive performance. *Journal of Applied Psychology, 90*, 827–841.

De Dreu, C. K. (2007). Cooperative outcome interdependence, task reflexivity, and team effectiveness: A motivated information processing perspective. *Journal of Applied Psychology, 92*, 628–638.

DeRue, D., Hollenbeck, J. R., Johnson, M. D., Ilgen, D. R., & Jundt, D. K. (2008). How different team downsizing approaches influence team-level adaptation and performance. *Academy of Management Journal, 51*, 182–196.

DeShon, R. P., Kozlowski, S. W. J., Schmidt, A. M., Milner, K. R., & Wiechmann, D. (2004). A multiple-goal, multilevel model of feedback effects on the regulation of individual and team performance. *Journal of Applied Psychology, 89*, 1035–1056.

Drazin, R., & Van de Ven, A. H. (1985). Alternative forms of fit in contingency theory. *Administrative Science Quarterly, 30*, 514–539.

Festinger, L. (1950). Informal social communication. *Psychological Review, 57*, 271–282.

Fong, G. T., Krantz, D. H., & Nisbett, R. E. (1986). The effects of statistical training on thinking about everyday problems. *Cognitive Psychology, 18*, 253–292.

Gamson, W. A., & Scotch, N. A. (1964). Scapegoating in baseball. *American Journal of Sociology, 70*, 69–72.

Gersick, C. J., & Hackman, J. (1990). Habitual routines in task-performing groups. *Organizational Behavior and Human Decision Processes, 47*, 65–97.

Hambrick, D. C. (1983). High profit strategies in mature capital goods industries: A contingency approach. *Academy of Management Journal, 26*, 687–707.

Hollenbeck, J. R., Ellis, A. P. J., Humphrey, S. E., Garza, A. S., & Ilgen, D. R. (2011). Asymmetry in structural adaptation: The differential impact of centralizing versus decentralizing team decision-making structures. *Organizational Behavior and Human Decision Processes, 114*, 64–74.

Hollenbeck, J. R., Moon, H., Ellis, A. P., West, B. J., Ilgen, D. R., Sheppard, L., et al. (2002). Structural contingency theory and individual differences: Examination of external and internal person-team fit. *Journal of Applied Psychology, 87*, 599–606.

Jackson, C. L., & LePine, J. A. (2003). Peer responses to a team's weakest link: A test and extension of LePine and Van Dyne's model. *Journal of Applied Psychology, 88*, 459–475.

Johnson, M. D., Hollenbeck, J. R., Humphrey, S. E., Ilgen, D. R., Jundt, D., & Meyer, C. J. (2006). Cutthroat cooperation: Asymmetrical adaptation to changes in team reward structures. *Academy of Management Journal, 49*, 103–119.

Jones, E. E. (1979). The rocky road from acts to dispositions. *American Psychologist, 34*, 107–117.

Kahneman, D., & Tversky, A. (1973). On the psychology of prediction. *Psychological Review, 80*, 237–251.

Katzell, R. A., & Guzzo, R. A. (1983). Psychological approaches to productivity improvement. *American Psychologist, 38*, 468–472.

Kluger, A. N., & DeNisi, A. (1996). Effects of feedback intervention on performance: A historical review, a meta-analysis, and a preliminary feedback intervention theory. *Psychological Bulletin, 119*, 254–284.

Koffka, K. (1922). Perception: An introduction to the Gestalt-Theorie. *Psychological Bulletin, 19*, 531–585.

Kohler, W. (1959). Gestalt psychology today. *American Psychologist, 14*, 727–734.

Kozlowski, S. W. J., & Bell, B. S. (2003). Work groups and teams in organizations. In W. C. Borman, D. R. Ilgen, & R. J. Klimoski (Eds.). *Handbook of psychology: Industrial and organizational psychology* (Vol. 12, pp. 333–375). Hoboken, NJ: John Wiley & Sons.

Langfred, C. W. (2007). The downside of self-management: A longitudinal study of the effects of conflict on trust, autonomy, and task interdependence in self-managing teams. *Academy of Management Journal, 50*, 885–900.

Laughlin, P. R. (1999). Collective induction: Twelve postulates. *Organizational Behavior and Human Decision Processes, 80*, 50–69.

Laughlin, P. R., & Adamopoulos, J. (1980). Social combination processes and individual learning for six-person cooperative groups on an intellective task. *Journal of Personality and Social Psychology, 38*, 941–947.

Laughlin, P. R., & Shippy, T. A. (1983). Collective induction. *Journal of Personality and Social Psychology, 45*, 94–100.

Leary, M. R., & Forsyth, D. R. (1987). Attributions of responsibility for collective endeavors. In C. Hendrick (Ed.), *Group processes* (pp. 167–188). Thousand Oaks, CA, USA: Sage Publications, Inc.

LePine, J. A., Piccolo, R. F., Jackson, C. L., Mathieu, J. E., & Saul, J. R. (2008). A meta-analysis of teamwork processes: Tests of a multidimensional model and relationships with team effectiveness criteria. *Personnel Psychology, 61*, 273–307.

LePine, J. A., & Van Dyne, L. (1998). Predicting voice behavior in work groups. *Journal of Applied Psychology, 83*, 853–868.

Levine, J. M., & Moreland, R. L. (1990). Progress in small group research. *Annual Review of Psychology, 41*, 585–634.

Manz, C. C., & Sims, H. P. (1982). The potential for 'groupthink' in autonomous work groups. *Human Relations, 35*, 773–784.

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

Miller, D. L., Young, P., Kleinman, D., & Serfaty, D. (1998). *Distributed dynamic decision-making simulation phase 1 release notes and user's manual*. Woburn, MA: Aptima, Inc.

Moon, H., Hollenbeck, J. R., Humphrey, S. E., Ilgen, D. R., West, B., Ellis, A. P., et al. (2004). Asymmetric adaptability: Dynamic team structures as one-way streets. *Academy of Management Journal, 47*, 681–695.

Moorhead, G., Neck, C. P., & West, M. S. (1998). The tendency toward defective decision making within self-managing teams: The relevance of groupthink for the 21st century. *Organizational Behavior and Human Decision Processes, 73*, 327–351.

Moreland, R. L. (1999). Transactive memory: Learning who knows what in work groups and organizations. In L. L. Thompson, J. M. Levine, & D. M. Messick (Eds.), *Shared cognition in organizations: The management of knowledge* (pp. 3–31). Mahwah, NJ US: Lawrence Erlbaum Associates Publishers.

Moreland, R. L., & Levine, J. M. (1992). Problem identification by groups. In S. Worchel, W. Wood, J. A. Simpson, S. Worchel, W. Wood & J. A. Simpson (Eds.), *Group process and productivity* (pp. 17–47). Thousand Oaks, CA, USA: Sage Publications, Inc.

Moreland, R. L., & McMinn, J. G. (2010). Group reflexivity and performance. In S. R. Thye & E. Lawler (Eds.). *Advances in group processes* (Vol. 27, pp. 63–95). Bingley, UK: Emerald Press.

Morgeson, F. P. (2005). The external leadership of self-managing teams: Intervening in the context of novel and disruptive events. *Journal of Applied Psychology, 90*, 497–508.

Morgeson, F. P., Johnson, M. D., Campion, M. A., Medsker, G. J., & Mumford, T. V. (2006). Understanding reactions to job redesign: A quasi-experimental investigation of the moderating effects of organizational context on perceptions of performance behavior. *Personnel Psychology, 59*, 333–363.

Mullen, B., & Copper, C. (1994). The relation between group cohesiveness and performance: An integration. *Psychological Bulletin, 115*, 210–227.

Naquin, C. E., & Tynan, R. O. (2003). The team halo effect: Why teams are not blamed for their failures. *Journal of Applied Psychology, 88*, 332–340.

Nelson, R. A., & Palmer, S. E. (2007). Familiar shapes attract attention in figure–ground displays. *Perception & Psychophysics, 69*, 382–392.

Pennings, J. M. (1992). Structural contingency theory: A reappraisal. In B. M. Staw & L. L. Cummings (Eds.). *Research in organizational behavior* (Vol. 14, pp. 267–309). Greenwich, CT: JAI Press.

Polley, D., Van Dyne, L., Beyerlein, M. M., & Johnson, D. A. (1994). The limits and liabilities of self-managing work teams. In M. M. Beyerlein & D. A. Johnson (Eds.). *Advances in interdisciplinary studies of work teams: Theories of self-managing work teams* (Vol. 1, pp. 1–38). USA: Elsevier Science/JAI Press.

Pritchard, R. D., Harrell, M. M., DiazGranados, D., & Guzman, M. J. (2008). The productivity measurement and enhancement system: A meta-analysis. *Journal of Applied Psychology, 93*, 540–567.

Reber, R., Zimmermann, T. D., & Wurtz, P. (2004). Judgments of duration, figure–ground contrast, and size for words and nonwords. *Perception & Psychophysics, 66*, 1105–1114.

Robinson, S., & Weldon, E. (1993). Feedback seeking in groups: A theoretical perspective. *British Journal of Social Psychology, 32*, 71–86.

Smither, J. W., London, M., & Reilly, R. R. (2005). Does performance improve following multisource feedback? A theoretical model, meta-analysis, and review of empirical findings. *Personnel Psychology, 58*, 33–66.

Snyder, M., & Jones, E. E. (1974). Attitude attribution when behavior is constrained. *Journal of Experimental Social Psychology, 10*, 585–600.

Stanovich, K. E., & West, R. F. (2008). On the relative independence of thinking biases and cognitive ability. *Journal of Personality and Social Psychology, 94*, 672–695.

Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science, 4157*, 1124–1131.

Van de Ven, A. H., & Delbecq, A. L. (1974). The effectiveness of nominal, delphi, and interacting group decision making processes. *Academy of Management Journal, 17*, 605–621.

Van Dyne, L., Graham, J. W., & Dienesch, R. M. (1994). Organizational citizenship behavior: Construct redefinition, measurement, and validation. *Academy of Management Journal, 37*, 765–802.

Wagner, J. (2000). Organizations. In A. E. Kazdin (Ed.). *Encyclopedia of psychology* (Vol. 6, pp. 14–20). New York, NY: American Psychological Association.

Weiner, B. (1980). A cognitive (attribution)–emotion–action model of motivated behavior: An analysis of judgments of help-giving. *Journal of Personality and Social Psychology, 39*, 186–200.

Yukl, G. (2002). *Leadership in organizations* (5th ed.). Upper Saddle River, NJ: Prentice-Hall.