

## **EFFICACY DISPERSION IN TEAMS: MOVING BEYOND AGREEMENT AND AGGREGATION**

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We challenge the assumption that within-team variability in team efficacy is simply a methodological concern and statistical prerequisite. We do so by developing a theoretical model and research agenda for the study of dispersion in team efficacy. We construct a taxonomy that distinguishes 4 distinct forms of dispersion in team efficacy, discuss the antecedents to these forms of dispersion, and examine how the forms of efficacy dispersion impact team emergent states, processes, and effectiveness.

Over the last several decades, significant efforts have been made to streamline large and bureaucratic organizations by eliminating low-level, simple jobs and reengineering the work around teams of people who share common goals, interact socially, and exhibit task interdependencies (Hackman, 1987; Ilgen, 1999; Kozlowski & Bell, 2003; Lawler, Mohrman, & Ledford, 1995). Consequently, understanding the determinants of team effectiveness has become vital to the management of contemporary organizations. Many researchers have theorized that team efficacy is an important determinant of team effectiveness (Bandura, 1997; Gist, 1987; Lindsley, Brass, & Thomas, 1995). Team efficacy has traditionally been defined as a team's shared belief that it can successfully perform a specific task (Lindsley et al., 1995). For instance, Bandura (1997) proposed that "people's beliefs in their team efficacy influence the type of future they seek to achieve, how they manage their resources, the plans and strategies they construct, how much effort they put into their group endeavor, their staying power when collective efforts fail to produce quick results or encounter forcible opposition, and their vulnerability to discouragement" (p. 478). Empirical research has further demonstrated that team efficacy as a shared belief among team members generally promotes higher team

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effectiveness (e.g., Gibson, 1999; Gully, Incalcaterra, Joshi, & Beaubien, 2002; Prussia & Kinicki, 1996).

Despite these promising findings, current literature on team efficacy presents only one part of a complex, multilevel phenomenon. Team efficacy is most often conceptualized and studied as a shared belief among team members regarding the team's capability to perform. Bandura (1997) stated that "although unanimity of efficacy belief within a group is rare, the differences in efficacy beliefs between groups should be greater than the variation within groups. Where individuals differ as widely in efficacy beliefs within groups as between groups, there is no distinguishable shared efficacy attribute for the group as a whole" (p. 479–480). Gully et al. (2002) reiterated this perspective: "if members fail to share (team efficacy) perceptions, then the appropriate level of analysis is the individual" (p. 821). Klein, Conn, Smith, and Sorra (2001) even conclude that "in the absence of substantial within-unit agreement, the unit-level construct is moot, untenable" (p. 4). In fact, variability in team efficacy beliefs is often construed as the absence of a team-level construct.

In contrast, Moritz and Watson (1998) argue that only considering team efficacy as a shared belief among team members disregards within-team variability that may in fact hold explanatory power beyond that of the shared construct. In this article, we refer to within-team variability as dispersion. Clearly, the magnitude of team efficacy is positively related to team effectiveness; that is, high levels of shared team efficacy generally enhance team effectiveness (Gully et al., 2002). Nevertheless, dispersion in team efficacy can exist for a variety of reasons and, independent of its magnitude, may meaningfully impact team effectiveness. For instance, individuals occupying different positions or holding different roles within the same social system may differ in how they view the team's capabilities (Bandura, 1993). Because of this, a subset of team members may have a different team efficacy belief than the rest of the team, and current theory on team efficacy does not address how these differences in team efficacy impact team functioning. Moreover, current theory does not address how and under what conditions different patterns of efficacy dispersion shape team functioning through the emergence of individual-level psychological processes at the team level. Therefore, the key theoretical question is whether or not dispersion in team efficacy is of substantive interest or is simply a methodological concern (i.e., measurement error). In this article, we develop the theoretical rationale for why dispersion in team efficacy is a meaningful predictor of team effectiveness.

We organize our theory-building process around four distinct elements. First, we develop a taxonomy that distinguishes between different *forms* of dispersion in team efficacy. A central premise of our theory is that the absolute amount of dispersion is a necessary but insufficient part of

understanding how team efficacy shapes team functioning. Teams can have the same amount of within-team variability (operationalized as the standard deviation of their scores or the level of ICC-type agreement) but have very different patterns or forms of dispersion in team efficacy. To understand these different forms of dispersion, we examine team efficacy from multiple levels of analysis. Specifically, we propose that these forms of dispersion have different implications for individual-level psychological processes, which then interact at the team level to shape team emergent states, processes, and effectiveness. To construct this taxonomy, we draw from Chan's (1998) typology of compositional models.

Second, we consider how the different forms of efficacy dispersion might evolve over time. Specifically, we theorize that there are two possible trajectories for dispersion in team efficacy. On the one hand, team efficacy beliefs can follow a pattern of *emerging consensus* whereby team members, over time, converge on more similar team efficacy beliefs. On the other hand, team efficacy beliefs can follow a pattern of *growing discord* such that team members' efficacy beliefs become more dissimilar over time. Differentiating between these two trajectories is important because teams can have the same magnitude and form of team efficacy dispersion but be on different trajectories that shape both present and future team functioning. In this article, we describe these two trajectories and discuss the conditions under which teams will follow one trajectory versus the other.

Third, we develop an organizing framework for understanding the antecedents to each form of efficacy dispersion. The literature on individual self-efficacy identifies numerous sources of efficacy information, including direct and vicarious experience and verbal persuasion (Bandura, 1982; Gist, 1987). To date, most literature on team efficacy assumes what is true at the individual level is also true at the team level—that these same sources explain the formation of team efficacy beliefs (Feltz & Lirgg, 1998; Riggs & Knight, 1994). We argue, however, that efficacy at the team level is a more nuanced phenomenon, and how we think about the sources of team efficacy, and in particular dispersion in team efficacy, should reflect this additional nuance. In this theory, we posit that the emergent form of dispersion in team efficacy can be a function of compositional elements (e.g., team member experience), structural elements (e.g., team virtuality, role differentiation), and social interactional processes (e.g., communication, modeling) within the team. In this sense, the sources of team efficacy dispersion include but go beyond the traditional sources of efficacy information at the individual level.

The fourth and final element in our theory building is a discussion of possible boundary conditions for the relationship between dispersion in team efficacy and team functioning. Specifically, we consider how

task interdependencies and social power and influence processes might moderate the impact of dispersion in team efficacy on team effectiveness.

*A Theory of Efficacy Dispersion in Teams*

Before we begin, we should be clear regarding our use of efficacy-related terms and levels of analysis. Individual-level team efficacy beliefs reflect an individual team member's own perception regarding his or her team's capability to perform effectively. At the team level, team efficacy refers to the collective belief of the team regarding the team's capability to perform effectively. Operationally, efficacy beliefs at the team level are typically described in the literature by their mean and variance (the first two moments of the distribution).<sup>1</sup> Nevertheless, teams with identical means and variances in team efficacy could still vary in terms of the forms of dispersion that we examine here: minority belief, bimodal, and fragmented. Our goal with this article is to explain why the form of dispersion is important to team functioning and offer a theoretical framework for understanding team efficacy across all four moments of the distribution (mean, variance, skew, kurtosis) as well the psychological and behavioral implications of these different forms of dispersion.

In Figure 1, we present a conceptual model of our theory. In this model, dispersion in team efficacy is a function of compositional, structural, and interactional elements within the team. From these antecedents, we posit that four forms of dispersion in team efficacy are possible: shared efficacy, minority belief, bimodal, and fragmented. We theorize that these forms of dispersion in team efficacy interact with the team's overall magnitude of team efficacy to differentially impact processes and emergent states in teams. Specifically, we predict that each form of dispersion in team efficacy differentially impacts task-related processes such as structuring, planning learning, and adapting, as well as social-oriented emergent states such as trusting and bonding. We expect these differential effects are a function of how team efficacy beliefs impact individual-level psychological processes and how these individual-level processes combine to yield emergent team-level properties. We then theorize that these relationships are moderated by internal and external features of the team context, namely task interdependence and social power and influence. This conceptual model highlights the complexity associated with moving beyond simple

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<sup>1</sup>An alternative to this is the use of team consensus ratings to assess team efficacy (Kirkman, Tesluk, & Rosen, 2001). Operationally, team consensus ratings eliminate any variance among team members. Conceptually, however, these consensus ratings may or may not eliminate the psychological differences among team members. Future research is needed to understand the implications of dispersion in team efficacy beliefs when team consensus ratings are employed.

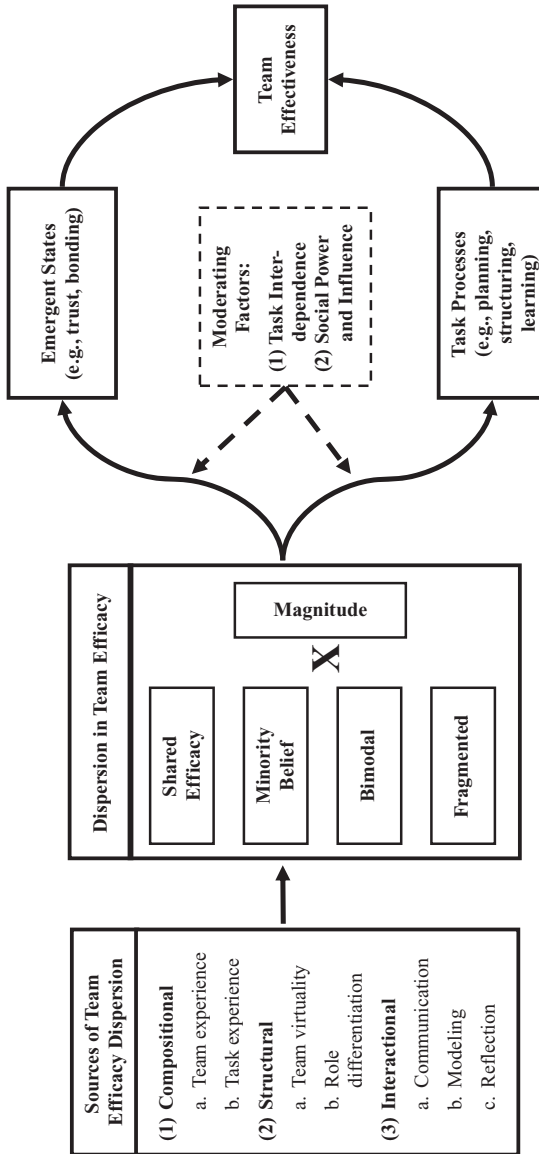


Figure 1: Dispersion in Team Efficacy: Antecedents and Outcomes.

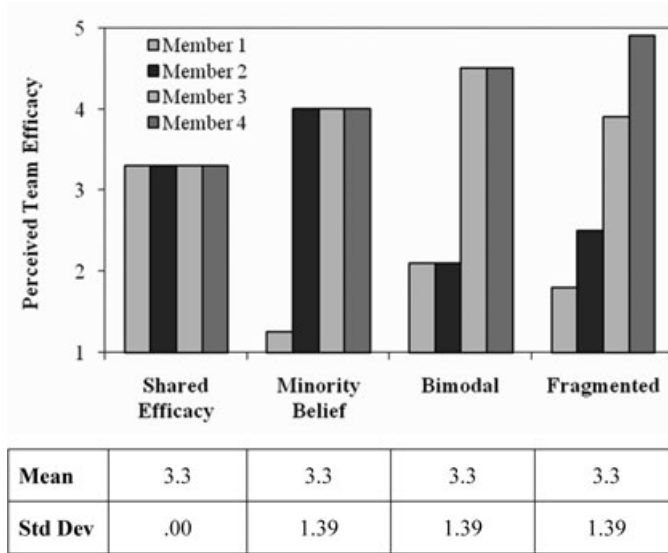
agreement and aggregation in the modeling of team efficacy and, in the same light, establishes a theoretical framework to guide future research.

*Team-Level Efficacy: A Taxonomy of Dispersion*

The notion of using dispersion as a focal construct can be traced back to James, Demaree, and Wolf (1984), and subsequent research has endorsed this approach when the theoretical basis for doing so is established (e.g., Barrick, Stewart, Neubert, & Mount, 1998; Chan, 1998; Kozlowski & Klein, 2000; Lindell & Brandt, 1997). With respect to team efficacy, Bandura (1997) states that “group members are rarely of one mind in their (efficacy) appraisals. A group belief, therefore, is best characterized by a representative value for the beliefs of its members and the degree of variability or consensus around that central belief” (p. 479). Kozlowski and Klein (2000) refer to this type of construct as configural and stress the importance of considering not only the amount of variance but also the pattern of individual beliefs within the team.

Team efficacy has traditionally been viewed as a shared belief among team members, but team efficacy can also be conceptualized as a configural construct where meaning is derived from the pattern or configuration of team efficacy beliefs. As illustrated in Figure 2, four teams with the same overall magnitude of team efficacy (team-level mean = 3.3) can have very different forms of dispersion in team efficacy. Teams can have the same mean *and* variance, but different levels of skewness and kurtosis will produce different forms of team efficacy dispersion. The four forms of dispersion in our taxonomy are shared efficacy, minority belief, fragmented, and bimodal. As illustrated in Figure 3, each of these forms of dispersion can be viewed in relation to low, moderate, and high magnitudes of team efficacy.

We expect these forms of dispersion in team efficacy to be important predictors of team effectiveness because of how team efficacy beliefs shape individual-level psychological processes and how those individual-level psychological processes emerge at the team level. Individual-level efficacy beliefs regulate behavior through four psychological processes: cognitive, motivational, affective, and selective (Bandura, 1997). Specifically, individuals with low efficacy tend to cognitively construct situations as risky and visualize failure, whereas individuals with high efficacy most often visualize success (Krueger & Dickson, 1994). Motivationally, the magnitude of efficacy beliefs impacts individuals' attributions for performance, expectancies, and goals. In particular, high efficacy beliefs tend to promote more persistence in challenging situations, higher expectancies, and more challenging and difficult goals. Efficacy also plays a pivotal role in shaping individuals' affective states by governing how

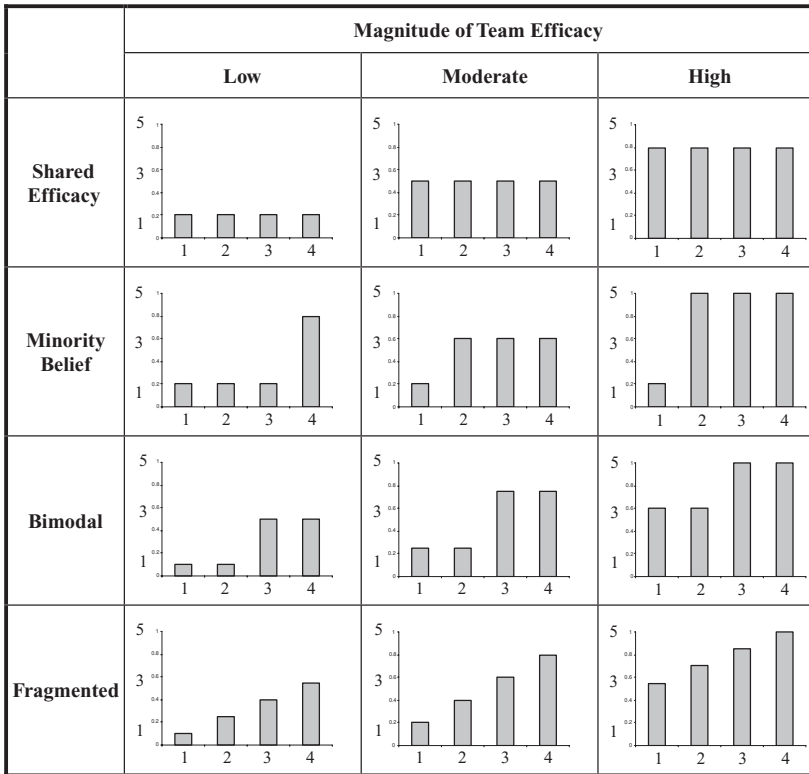


*Note.* Each graph in this figure represents a four-person team. The y-axis of each graph represent team members' team efficacy beliefs on a 5-point Likert scale (1 = low; 5 = high).

*Figure 2: Dispersion in Team Efficacy.*

individuals respond emotionally to potential threats and stressors (e.g., Bandura, Cioffi, Taylor, & Brouillard, 1988). In particular, low efficacy individuals tend to have negative emotional reactions to challenging situations. Finally, efficacy beliefs influence the activities and environments with which people choose to participate. Individuals tend to avoid or withdraw from environments they believe exceed their capabilities, but they readily undertake activities and enter social environments they judge themselves capable of handling (Meyer, 1987).

With respect to these psychological processes, existing theory and research has generally approached team efficacy as if it is isomorphic and functionally equivalent across levels of analysis. Isomorphism exists when the same relationships and underlying processes can be used to represent a construct such as team efficacy at more than one level of analysis (Miller & Miller, 1992; Rousseau, 1985). For example, Prussia and Kinicki (1996) showed that the individual-level relationships found for self-efficacy, prior performance, vicarious experience, and verbal persuasion were operative for team efficacy as well. According to Moritz and Watson (1998), however, a multilevel conception of team efficacy is incomplete without considering potential discontinuities across levels of analysis. Discontinuities exist when the relative difference or pattern of



*Note.* Each graph in this figure represents a four-person team. The y-axis of each graph represent team members' team efficacy beliefs on a 5-point Likert scale (1 = low; 5 = high); the x-axis identifies each of the four team members.

*Figure 3: Forms of Dispersion at Different Magnitudes of Team Efficacy.*

individual attributes within a team predicts team-level outcomes above and beyond the absolute magnitude of individual variables (House, Rousseau, & Thomas-Hunt, 1995).

In this article, we posit that dispersion in team efficacy represents a potential discontinuity in how team efficacy operates across levels of analysis. Specifically, we propose that the individual-level psychological processes that are triggered by team efficacy beliefs come together and operate in different ways depending on the form of dispersion in team efficacy. Differences in how these individual-level psychological processes come together at the team level explain why the forms of dispersion in team efficacy have differential effects on emergent states and processes in teams and, ultimately, team effectiveness.

### *Shared Efficacy*

The first form of dispersion in team efficacy is called shared efficacy. The shared efficacy form presents a lack of variability among team members' efficacy beliefs and is therefore consistent with the widely accepted conceptualization of team efficacy as a *shared* belief among team members regarding the team's capacity to perform a specific course of action (Bandura, 1986, 1997; Gully et al., 2002). By incorporating this form of dispersion into our taxonomy, we anchor the present theory in a much wider nomological network of research on team efficacy that requires team members to generally agree on team efficacy beliefs.

When team members share the same general team efficacy belief, they are more likely to exhibit similar cognitive, motivational, affective, and selective psychological tendencies than if those same team members had divergent team efficacy beliefs. Likewise, team members should maintain similar expectancies for team performance, attribute success or failure in similar ways, and have similar emotional responses to team stimuli. When team members exhibit similar psychological patterns, it has implications for how these individual-level psychological processes emerge at the team level. Specifically, team members should coalesce around a single set of psychological responses that is determined by the overall magnitude of team efficacy.

When team efficacy is low in a shared efficacy configuration, all team members hold the same low team efficacy beliefs. As a result, team members are likely to share low expectancies for team performance, collectively arouse negative emotions, attribute performance to uncontrollable factors, avoid task engagement, and share a basic feeling of helplessness—all of which negatively impact socially oriented emergent states (e.g., trusting, bonding), task processes (e.g., structuring, planning), and ultimately team effectiveness (Bandura, 1997; Ilgen, Hollenbeck, Johnson, & Jundt, 2005). Indeed, the strength of this relationship at the team level may be even stronger than the same relationship at the individual level because homogeneous groups show a strong bias to search for information that confirms, rather than challenges, their initial beliefs (Kerschreiter, Schulz-Hardt, Mojzisch, & Frey, 2008; Schulz-Hardt, Frey, Luthgens, & Moscovici, 2000). Therefore, efficacy beliefs in teams such as this are likely to be extremely stable and strongly held.

When team efficacy is high in a shared efficacy configuration, all team members should have high expectancies for team performance, set challenging and difficult goals, have positive emotional responses to team stimuli, and fully engage in the team task. These individual-level psychological processes should emerge at the team level to produce high levels of trusting and bonding in the team, as well as high levels of task-related

structuring, planning, learning and adapting. These emergent states and processes have been shown to translate into higher team effectiveness (Ilgen et al., 2005), and existing theory and recent meta-analytic evidence suggest that team efficacy, as a shared construct, is positively related to team performance (Gully et al., 2002). Therefore, for teams with a shared efficacy configuration, we propose:

*Proposition 1a: For teams with shared efficacy, the overall magnitude of team efficacy will be the key determinant of team effectiveness.*

*Proposition 1b: For teams with shared efficacy, there will be a positive relationship between the magnitude of team efficacy and team effectiveness.*

### *Minority Belief*

Disagreement is natural in group contexts and can have both positive and negative effects on team functioning (e.g., Jehn & Bendersky, 2003). Bandura (1997), for instance, notes that “some of the clashes are dysfunctional . . . but other disagreements serve a useful purpose” (p. 479). The minority belief form of dispersion presents a situation where a single team member has a meaningfully different team efficacy belief relative to the rest of the team. If the magnitude of team efficacy is high at the team level, the minority team member will have a relatively lower team efficacy belief (i.e., negative skewness). On the other hand, if team efficacy is low at the team level, the minority team member will have a higher team efficacy belief than the rest of the team (i.e., positive skewness). In this section, we draw from efficacy theory to explain how a minority belief form of dispersion will impact team effectiveness.

In minority belief configurations, the minority team member has three possible behavioral options: withdraw from the situation completely, challenge and attempt to change the majority belief, or conform to the majority belief. According to efficacy theory, the behavioral response of the minority individual will depend on whether this person has a lower or higher team efficacy belief than the rest of the team. We begin by discussing the former configuration. It is important to note that an individual’s behavioral response may also depend on his or her social position within the team, which is a point we return to later in this article.

In teams where the minority individual has a relatively low team efficacy belief, efficacy theory suggests this person will have, relative to other team members, lower expectancies, more negative effect in response to team stimuli, and a greater tendency to withdraw from challenging situations (Bandura, 1986, 1997). Therefore, according to efficacy theory,

a minority team member with low team efficacy would not challenge or conform to the majority belief, but rather this person will most likely withdraw psychologically from the situation. Similar withdrawal patterns can be observed in other research that suggests being the minority individual in a group is socially risky (Wood, Lundgren, Ouellette, Busceme, & Blackstone, 1994) and, as a result of this risk, makes it less likely that the minority individual will challenge the beliefs or opinions of the majority (Latane & Wolf, 1981; Tanford & Penrod, 1984). It is important to note here that our theory does not assume efficacy beliefs are explicitly discussed among team members. When we refer to challenging the beliefs or opinions of other team members, we expect this occurs in relation to the manifestations of efficacy beliefs (e.g., goals, expectancies, views of risk), which are openly discussed in team contexts not the actual efficacy beliefs themselves.

We expect that the psychological withdrawal tendencies of minorities with low team efficacy will have negative implications for emergent states and processes in teams. In particular, the low expectancies and withdrawal tendencies of minorities with low team efficacy can result in a social loafing situation where the minority individual reduces his or her motivation and effort directed at teamwork. Research indicates that individuals who reduce their effort toward team activities risk rejection from other team members, therefore lowering the amount of trusting and bonding that occurs in the team and overall team effectiveness (Jackson & LePine, 2003). Moreover, it is likely the psychological withdrawal of the minority individual will also impair task-related structuring and planning processes in the team, as well as the team's capacity to learn and adapt to changes in the team environment. The minority individual might have expectancies and views on team goals and risk that would be valuable to the team, but because of the withdrawal behavior, these viewpoints are less likely to be communicated in the team—despite research suggesting that mere exposure of a majority to differing views on team functioning can lead to enhanced structuring, planning, adapting, and learning processes (Gruenfeld, 1995; Nemeth, 1986; Van Knippenberg, De Dreu, & Homan, 2004; Wood et al., 1994). In fact, teams may experience a false sense of agreement and hope because the minority individual with low team efficacy psychologically withdraws from the team. Therefore, relative to teams with shared efficacy, we propose the following for minority belief teams:

*Proposition 2: A minority belief configuration where the minority team member has a relatively low team efficacy belief will detract from team effectiveness by impairing socially oriented emergent states (trusting, bonding)*

*and task-related team processes (structuring, planning, learning, adapting).*

In minority belief teams where the minority team member has relatively high team efficacy, the minority individual has the same three behavioral options: withdraw from the situation, challenge and attempt to change the majority belief, or conform to the majority belief. Efficacy theory suggests the minority individual will have, relative to other team members, higher expectancies for team performance, more positive effect in responding to team stimuli, and more persistence when responding to challenges (Bandura, 1986, 1997). One such challenge is being the minority in a team of nonbelievers. As a result, we expect the minority individual in this case will not withdrawal psychologically from the team. Instead, this person should be motivated to share his or her viewpoints on risk, goals, and expectancies—even if other team members hold differing viewpoints as a function of their lower team efficacy beliefs.

The motivation, persistence and engagement that we expect from the high team efficacy individual will have important implications for team processes and performance. On the one hand, the team should benefit from the minority individual being motivated to challenge the other team members' views on risk, goals, and expectations for the team. In fact, expression of minority perspectives has been shown to enhance teams' task-related structuring, planning, learning, and adapting processes via greater consideration of alternatives, divergent thinking, and integration of multiple perspectives (Gruenfeld, 1995; Nemeth, 1986; Wood et al., 1994). On the other hand, a minority who disagrees with an emerging group consensus also risks creating within-team conflict and social disapproval, therefore impairing emergent states such as trusting and bonding among team members (Moscovici, 1980, 1985; Mugny, 1982; Schachter, 1951). We expect this is especially true when the minority individual has high team efficacy and is therefore more motivated to engage in and influence team functioning. Therefore, relative to shared efficacy teams, we propose the following for minority belief teams where the minority individual has a relatively higher team efficacy belief than the rest of the team.

*Proposition 3: A minority belief configuration where the minority team member has a relatively higher team efficacy belief will have mixed effects on team effectiveness by impairing socially oriented emergent states (trusting, bonding) and enhancing task-related team processes (structuring, planning, learning, adapting).*

*Bimodal*

The bimodal form of dispersion illustrates a distribution of team efficacy beliefs along which subgroups form within the team. In this section, we integrate efficacy theory with the research on subgroup formation in teams (e.g., Lau & Murnighan, 1998, 2005; Li & Hambrick, 2005) to illustrate how bimodal dispersion in team efficacy impacts overall team effectiveness. According to efficacy theory, we expect two subgroups that hold different team efficacy beliefs to exhibit fundamentally different psychological patterns. For example, the subgroups are likely to cognitively construct the team environment in very different ways. A subgroup with high team efficacy is expected to visualize the team succeeding, whereas a low team efficacy subgroup will most likely view the team situation as risky and bound for failure. Motivationally, the two subgroups are likely to make different attributions for success and failure, and this will result in different expectations for how well the team will perform in the future, as well as different goal levels for the team.

Unfortunately, efficacy theory offers limited guidance on how subgroup differences in terms of team efficacy will emerge at the team level and impact overall team effectiveness. Efficacy theory is primarily an individual-level theory, and at least until now, when efficacy theory has been applied to team contexts, the assumption has been that team members share the same team efficacy belief. Therefore, to inform this discussion, we turn to the literature on diversity and subgroup formation in teams and conclude that bimodal forms of dispersion in team efficacy likely have both positive and negative implications for team functioning.

A common theme in the team diversity literature is that subgroup formation within teams enhances team performance on a variety of tasks. For example, on tasks that do not have a demonstrably correct response (e.g., judgment tasks), a subgroup of at least two team members is necessary for effective team processes (Laughlin, 1999). In this case, each subgroup's opinion or perspective will be expressed and fully considered in team planning and structuring processes because multiple parties within the team endorse it (Azzi, 1993; Wittenbaum & Stasser, 1996). Subgroups based on team efficacy will hold different cognitive orientations, goals, attributions, and expectancies when planning and structuring team activities. Although these subgroups may not directly debate their respective efficacy beliefs, it is likely these subgroups will discuss the different manifestations of these team efficacy beliefs (e.g., goals, risk perceptions). Because no team member is alone in his or her belief, a bimodal configuration creates a social environment where it is safe to hold different beliefs about team efficacy and share differing views related to goals, risk, and expectancies. We expect this is especially important for

the team members who have relatively low team efficacy; in the absence of a partner, low team efficacy individuals would likely withdrawal psychologically from the team. Considering that teams learn and adapt more easily when subgroups are present in the team (Ellis, et al. 2003; Gibson & Vermeulen, 2003), this safe space should positively impact team effectiveness through enhanced task-related processes such as planning, structuring, and learning and adapting.

Despite the potential benefits of subgroups in team contexts, there are also potential drawbacks to a bimodal form of dispersion in team efficacy. Social categorization theory argues that team members tend to increase social interaction within their own subgroup and decrease communication with other subgroups, therefore reducing the degree of trust between subgroups and for the team as a whole (Abrams, Wetherell, Cochrane, Hogg, & Turner, 1990; Hogg & Terry, 2000). These negative consequences are often attributed to increased conflict and less social integration within the team (e.g., Katz, 1982; O'Reilly, Caldwell, & Barnett, 1989; Mortensen & Hinds, 2001; Zenger & Lawrence, 1989). Therefore, whereas a bimodal form of dispersion in team efficacy may positively impact task-related processes, we expect this form of dispersion to negatively impact socially oriented emergent states such as trusting and bonding in the team. We made a similar prediction for minority belief when the minority individual had a higher team efficacy than the majority. Nevertheless, the causal driver for these predictions is different. In the case of minority belief, the causal driver was that the minority individual had a higher team efficacy belief and, as a result, was psychologically engaged and motivated to engage in team processes despite being the minority. In the case of bimodal, the causal driver is that each team member has the support of at least one other team member and therefore should feel comfortable engaging in the team process in accordance with his or her team efficacy belief. Therefore, relative to shared efficacy teams, we propose the following for bimodal teams:

*Proposition 4: A bimodal configuration will have mixed effects on team effectiveness by impairing socially oriented emergent states (trusting, bonding) and enhancing task-related team processes (structuring, planning, learning, adapting).*

In terms of magnitude, there are three possible bimodal configurations: low-high, low-moderate, and moderate-high. We expect that as subgroups become more divergent in their team efficacy beliefs, the negative effects of a bimodal configuration on socially oriented emergent states will become stronger. When team members have dramatically different perceptions of team capabilities and performance expectations,

these individuals are less likely to have a common team identity and less likely to experience cohesion among team members. Likewise, as subgroups' team efficacy beliefs become more divergent, any positive effect on task-related team processes will likely diminish. Team members will be less likely to find a common approach to planning and structuring the team task, or learning and adapting in dynamic team contexts. Therefore, we propose the following with respect to magnitude in bimodal teams:

*Proposition 5: As subgroups become more divergent in their team efficacy beliefs, the impact of bimodal on team effectiveness will become more negative.*

### *Fragmented*

The fragmented form of dispersion presents a situation where all team members have meaningfully different team efficacy beliefs, therefore producing a high degree of heterogeneity in the team. Despite the dispersion of team efficacy beliefs in this highly heterogeneous team, few common bases exist for the formation of social factions or subgroups. As a result, "members will attempt to create and establish a new *shared* understanding of team members status, team processes, role expectations, communication methods, and so on" (Earley & Mosakowski, 2000, p. 29). In other words, team members may initially have different team efficacy beliefs, but due to the high degree of heterogeneity and lack of coalitions, these teams ultimately search for, develop, and perform as if they have a shared team efficacy belief. A similar effect can be found in Earley and Mosakowski's (2000) research demonstrating that a high degree of heterogeneity in teams is preferred over moderate levels of heterogeneity. We adopt a similar logic to delineate the implications of a fragmented form of dispersion in team efficacy. It is important to note that we are considering a static view of fragmented teams here; we discuss the temporal aspects of our theory in more detail later in this article.

As stated previously, team members who share the same team efficacy belief tend to coalesce around a single set of psychological responses that is determined by the overall magnitude of team efficacy. If fragmented teams are to behave in a similar fashion, as proposed here, the overall magnitude of team efficacy (i.e., the team-level mean) will be a key determinant of team functioning. When overall team efficacy is low in a fragmented configuration, there will be variance in team members' beliefs but, in general, those beliefs will be low to moderate across all team members (see Figure 2). As a unit, this team should function as if it has a collective team efficacy somewhere between low and moderate. Team members will

generally exhibit low to moderate expectancies for team performance, generally negative emotions, and a shared sense of helplessness—all of which negatively impact team effectiveness. On the other hand, when overall team efficacy is high in a fragmented configuration, individuals' team efficacy beliefs will range from moderate to high. As was the case with shared efficacy teams, the individual-level psychological processes associated with higher team efficacy will emerge at the team level to produce emergent states and processes that facilitate higher levels of team effectiveness.

Nevertheless, in contrast to shared efficacy teams, Fragmented teams will consist of greater variation in individual-level psychological processes such as expectancies, goals, and views of risk. Although differences in team efficacy beliefs may not be discussed directly, these differences in psychological processes should emerge in the team. Because there are no social factions in the team, each team member will be more inclined to share his or her expectations of the team, goals for the team, and risk perceptions. We expect this will be true even for team members with relatively low team efficacy beliefs because these team members are not in the minority—there is no majority or minority in fragmented teams—and there is some hope among team members. The motivation to share this information among team members should enhance task-related team processes such as structuring, planning, and learning. In addition, fragmented teams will be less susceptible to the problems associated with extremely high or low magnitudes of team efficacy. Extremely high magnitudes of efficacy can result in complacency and hinder learning processes (Vancouver, Thompson, & Williams, 2001), and extremely low magnitudes produce a sense of helplessness and promote psychological withdrawal (Bandura, 1997). A fragmented configuration in team efficacy should protect teams from these potential pitfalls more so than a shared efficacy configuration—while still benefiting from increased levels of trusting and bonding due to the absence of any social factions or subgroups in the team. In fact, we expect that the same shared commitment to team goals that one sees in shared efficacy teams is possible in fragmented teams because there are no subgroups to hinder team communication and identification, and so the focus is still on the team (not “us vs. them”). For this reason, fragmented teams should offer the “best of both worlds” and outperform shared efficacy teams, especially at high or low magnitudes of team efficacy. Therefore, we propose the following:

*Proposition 6a: A fragmented form of dispersion in team efficacy will positively impact team effectiveness through enhanced task-related team processes and socially oriented team emergent states.*

*Proposition 6b: At high or low magnitudes of team efficacy, fragmented teams will achieve higher levels of team effectiveness than shared efficacy teams.*

In addition to the pure fragmented form of dispersion in team efficacy, team efficacy beliefs might also emerge in a hybrid form of fragmented. Specifically, teams could consist of multiple, different minority perspectives (e.g., a high minority, a low minority) coupled with team members who agree at some moderate magnitude of team efficacy. This configuration is a hybrid of the fragmented form of dispersion in the sense that there are more than two different team efficacy beliefs represented in the team, with the only agreement at a moderate magnitude of team efficacy. We expect this form of dispersion in team efficacy to function much like the pure fragmented form. Psychologically, team members should coalesce around a central team efficacy belief, and as a result of not having dominant social factions in the team and engaging in key task-related processes, we expect these teams to achieve higher levels of team effectiveness than teams with other forms of team efficacy dispersion.

#### *Sources and Temporal Aspects of Dispersion in Team Efficacy*

Up to this point, we have discussed dispersion in team efficacy as a fairly static concept that emerges as one of four unique forms: shared, minority belief, bimodal, or fragmented. In this section, we advance our understanding of team efficacy dispersion in two important ways. First, we theorize about how these forms of dispersion evolve over time. We then specify the antecedents to each of the forms of dispersion in team efficacy and theorize about how these different antecedents shape the evolution of team efficacy dispersion over time. The result of this discussion is a theoretical framework that can guide future research on the formation and development of team efficacy dispersion over time.

We propose that team efficacy dispersion is a function of three general types of antecedents: team composition, structural features, and social interactional processes. We propose that the compositional and structural antecedents are most predictive of the initial form of team efficacy dispersion, whereas the social interactional processes are more predictive of how those forms of team efficacy dispersion evolve over time. As teams develop over time, we propose that the form of team efficacy dispersion evolves in one of two possible trajectories: (a) *emerging consensus* or (b) *growing discord*. Emerging consensus indicates that the team is moving from a state of greater dispersion to less dispersion (e.g., bimodal to minority belief). On the other hand, growing discord indicates that the team is moving in a direction toward greater dispersion (e.g., from shared

efficacy to minority belief, or from minority belief to bimodal). Our notion of trajectory is particularly important because two teams could have the same form of team efficacy dispersion at a single point in time, but the two teams could be very different in terms of trajectory. For example, if one team arrived at minority belief through growing discord (i.e., from shared efficacy) and another team got to minority belief through emerging consensus (i.e., from bimodal or fragmented), these teams will likely function quite differently even though they have the same form of team efficacy dispersion. In this sense, the direction of movement in terms of trajectory can have explanatory power above and beyond the effect associated with the configuration of team efficacy beliefs. Therefore, in this section, we not only identify which antecedents explain the initial form of team efficacy dispersion, but we also identify the sources that explain which trajectory teams will experience. In doing so, we address an important limitation of existing research, which has predominantly focused on teams at a single point in time and not considered the temporal aspects of team efficacy.

*Compositional.* Among the sources of efficacy information first identified by Bandura (1982), direct experience is commonly noted as being most influential (Gist, 1987). With respect to dispersion in team efficacy beliefs, experience is likely still a predominant source of efficacy information, but we posit that it is the configuration of experience in the team that ultimately determines which form of dispersion will emerge. The structure of a collective construct such as team efficacy is a function of how its component parts interconnect (Morgeson & Hofmann, 1999), and in the case of team efficacy, we expect an important component is the experience of team members. As illustrated in Figure 4, we posit that two types of experience are particularly important antecedents to dispersion in team efficacy, namely team members' experience working together as a team and team members' experience with the task. We focus on these types of experience for two reasons. First, a team's ability to successfully perform a task, which is the basis of team efficacy, is a function of team members'

		Level of experience with the task		
		Low	Moderate	High
Level of experience with the team	Low	Fragmented	Fragmented	Fragmented
	Moderate	Fragmented	Bimodal/ minority belief	Bimodal/ minority belief
	High	Fragmented	Bimodal/ minority belief	Shared efficacy

Figure 4: Experience as a Source of Team Efficacy Dispersion.

ability to perform the task as well as their ability to work together as a team (Cannon-Bowers & Salas, 1997). Therefore, it seems likely that team members' experience with both teamwork and taskwork will be important. In addition, there is some evidence in the literature that these experience types are important predictors of team functioning (Littlepage, Robison, & Reddington, 1997), but it is unclear from this research how these experiences influence the emergence of team efficacy beliefs.

When teams are first formed, there are several levels of experience that are particularly important for understanding the configuration of experiences in the team. In some cases, team members will have no prior experience working together and/or with the task. In other cases, team members will have a lot of experience working together and/or with the task. There will also be teams that consist of mixed experience levels, whereby some team members will have worked together previously or have prior experience with the task, but other team members will not have this prior experience. It is important to note that these two experience types are independent; for example, members of wildland firefighting teams are often quite experienced with the task but are asked to work with other firefighters who they do not know and have not worked with previously (Weick, 1993).

Experience working together as a team facilitates a socialization process that develops important social and interpersonal knowledge among team members (Katz, 1982; Smith, et al., 1994). Team members learn about each others' strengths and weaknesses and come to understand how other members of the team can contribute to task accomplishment. Moreover, experience working together as a team helps develop norms and routines for working together, communicating, and dealing with problems (Kozlowski, Gully, Nason, & Smith, 1999; Zenger & Lawrence, 1989). In this sense, experience working together develops shared interpersonal knowledge among team members and common mental models of team functioning (Liang, Moreland, & Argote, 1995; Rentsch, Heffner, & Duffy, 1994). Likewise, task-specific experience facilitates knowledge development, but in this case, the gained knowledge is about the specific job or task that the team must accomplish (Goodman & Shah, 1992; Schmidt, Hunter, & Outerbridge, 1986). Because team efficacy beliefs are a function of team members' ability to perform the task and work together effectively, we expect the configuration of these experience types in the team will be important antecedents to how individual team efficacy beliefs emerge at the team level.

When all of a team's members have considerable prior experience working together *and* with the team task, those team members are likely to share similar team efficacy beliefs. Individuals share a rich understanding of their team members and how well they work together, as well as a

deep understanding of what is required to perform well on the task. In contrast, when a team's members lack either of these experience types, there is considerable opportunity for dispersion in team efficacy beliefs. A lack of experience working together limits team members' social, interpersonal knowledge and therefore their understanding of how well individual team members can work together—even if members of the team have considerable task-specific experience. Likewise, when team members lack task experience, it is likely that they will hold different viewpoints about what activities are required to perform well on the task and the team's ability to perform those activities—even if team members have previously worked together as a team. Following this logic, we offer the following two propositions:

*Proposition 7: When all team members lack experience working together or lack experience with the task, a fragmented form of dispersion will emerge.*

*Proposition 8: When all team members have considerable experience working together and with the task, a shared efficacy form of dispersion will emerge.*

It is also possible that, when teams are formed, some team members will have experience working together as a team and other team members will not. Likewise, it is possible that some team members will have experience with the task and others will not. When teams consist of these mixed configurations of team and task experience, we expect a bimodal or minority belief form of team efficacy dispersion will emerge. The specific form of dispersion will be a function of how team and task experiences are configured in the team. Indeed, past research has shown a strong relationship between initial, prediscussion individual states or beliefs and the final postdiscussion configuration of team-level states and beliefs in the absence of any external or internal interventions (Kelly & Karau, 1999). For example, when there is an individual in the team who has a meaningfully different experience profile than the rest of the team (e.g., the only new member of a team, the only individual who has experience with the task), a minority belief form of team efficacy dispersion will likely emerge. Likewise, when subgroups form along team and/or task experience, a bimodal form of team efficacy dispersion should emerge. In this sense, the structure or configuration of experience in the team leads to a parallel configuration of team efficacy beliefs. As such, we propose the following:

*Proposition 9: When teams are composed of mixed team and task experience, a minority belief or bimodal form of team efficacy dispersion will emerge, and the specific form*

*of team efficacy dispersion will mirror the configuration of experience in the team.*

In addition, we expect the minority belief or bimodal form of dispersion to be most salient and resistant to change when team and task experiences are configured in the same pattern. For example, if both team and task experience are configured into the same subgroup structure, the bimodal form of dispersion that emerges will likely be stronger than a bimodal form that emerges when only one of these experience types is configured into subgroups. Likewise, when team members are mixed on one type of experience (e.g., task) but share considerable amounts of the other type of experience (e.g., team), we expect the bimodal or minority belief form of dispersion that emerges will be weaker and more susceptible to change. This notion of change over time illuminates the importance of understanding how dispersion in team efficacy evolves and what team processes facilitate this evolution.

*Structural.* In addition to the composition and configuration of team member experience, there are elements of team structure that also likely influence which form of team efficacy dispersion will emerge. The first structural element that we focus on is role differentiation. We expect differences in roles among team members to predict the form of team efficacy dispersion. Efficacy beliefs are partially a function of what team members' roles require them to perform (e.g., how challenging specific tasks and role requirements are perceived to be), and therefore, differences in team member roles can result in different efficacy beliefs among team members. The second structural element we examine is the degree of team virtuality or co-location among team members, which we expect can produce different forms of team efficacy dispersion by influencing the degree to which team members share a common experience in the team.

*Role differentiation.* Roles are most often described as an expected pattern or set of behaviors (Biddle, 1979), and often serve as the basis or referent upon which individuals develop expectations about their ability to perform (Katz & Kahn, 1978; Welbourne, Johnson, & Erez, 1998). In this sense, efficacy beliefs are embedded in a particular role, and the nature of that role will shape individuals' efficacy beliefs. Drawing from role differentiation theories (Bales & Slater, 1955; Slater, 1955), we propose that differences in roles among team members will influence which form of team efficacy dispersion emerges in the team. In particular, holding other variables constant, the perceived challenge associated with performing a particular role in the team should have a negative relationship with the role holder's efficacy beliefs. In addition, roles can differ by type (Welbourne et al., 1998), and certain types of roles will be particularly influential for determining how team efficacy beliefs emerge at the team level. For

example, boundary spanning roles require team members to establish relationships and interactions with actors and stakeholders external to the team (Ancona, 1990; Ancona & Caldwell, 1992). Recent research suggests that these boundary spanning roles can induce role conflict and overload (Marrone, Tesluk, & Carson, 2007), which should in turn inhibit efficacy beliefs.

To the extent that team members' roles differ along dimensions such as challenge and type, we expect greater dispersion in team efficacy beliefs. Specifically, we posit that the form of team efficacy dispersion will mirror the configuration of roles in the team. If all team members have roles with similar characteristics and performance expectations, holding individual ability and experience constant, we would expect a shared efficacy form of team efficacy dispersion to emerge. If a single minority has a unique role in the team or subgroups form along role expectations, it is likely that the form of team efficacy dispersion will be minority belief or bimodal, respectively. Finally, if all team members have unique role requirements and performance expectations, a fragmented form of team efficacy dispersion will likely emerge. Therefore, we propose the following with respect to role differentiation:

*Proposition 10: The form of team efficacy dispersion will mirror the differentiation of roles among team members.*

*Team virtuality and co-location.* Team virtuality assesses the extent to which teams use virtual means to communicate and execute team processes, and the degree to which teams are separated in time and space (Bell & Kozlowski, 2002; Kirkman & Mathieu, 2005). At high levels of team virtuality, team members are separated in time and space, and most communication and work coordination occurs via virtual means. At low levels of team virtuality, team members are generally co-located in the same geography and work occurs primarily through face-to-face interaction. At moderate levels of team virtuality, it is likely that some team members are co-located and able to coordinate face to face, whereas other team members are separated from the group and forced to primarily work and communicate via virtual means.

For purposes of our theorizing, we expect that, in co-located teams where communication and work occurs primarily face to face, team members will have a greater shared, common experience. As a result, low team virtuality should lead to the emergence of a shared efficacy form of team efficacy dispersion. In contrast, team members who are separated in time and/or space are less likely to have the same shared experience and, as a result, are less likely to share the same team efficacy beliefs. In fact, we expect that teams with high levels of virtuality to experience fragmented forms of team efficacy dispersion. For teams with a moderate amount of

virtuality, we expect a minority belief or bimodal form of team efficacy dispersion to emerge—exactly which form will depend on the structure of team virtuality. If a single team member is separated from the team in time and/or space, a minority belief configuration is most likely. If subgroups form in terms of team virtuality, a bimodal form of team efficacy dispersion is more likely. Following this reasoning, we propose the following regarding team virtuality and the degree of co-location in teams:

*Proposition 11: The degree of team virtuality will predict which form of team efficacy dispersion emerges such that (a) low virtuality leads to shared efficacy, (b) moderate virtuality leads to either minority belief or bimodal, and (c) high virtuality leads to fragmented.*

*Social interactional processes.* Extending original theory on self-efficacy formation at the individual level (Bandura, 1982, 1986) to the team level, we expect several social interactional processes to be critical determinants of whether teams experience an emerging consensus or growing discord trajectory in team efficacy dispersion. These include communication and verbal persuasion, modeling and vicarious learning, and reflective processes.

The quantity and quality of within-team communication and verbal persuasion among team members should influence the convergence of team efficacy beliefs over time. For example, to the extent that progress toward goal accomplishment and what needs to be done for goal attainment is communicated effectively across all team members or at least communicated to others by a particularly persuasive team member (e.g., the leader), this should lead to greater shared perceptions among team members regarding how well team members work together and perform the team task, therefore leading to emerging consensus. In teams that do not communicate effectively about goals or the attainment of those goals, team members are more likely to develop different views of how well the team is performing, as well as the team's capacity to perform in the future. A lack of communication and verbal persuasion should lead to growing discord in team efficacy beliefs over time as team members lack a shared understanding of the team's progress toward goal attainment. We expect this is one way in which team leadership can impact dispersion in team efficacy, given that one function team leaders fulfill is disseminating and making sense of performance-related information (Zaccaro, Rittman, & Marks, 2001).

Similar to the effect for communication and verbal persuasion, opportunities for modeling and vicarious learning among team members should facilitate a pattern of emerging consensus in team efficacy beliefs. As team members observe each other's performance and are able to model their

behaviors to become more effective as a team, team members' efficacy beliefs should converge. On the other hand, fewer opportunities to model and learn vicariously through others should lead to a pattern of growing discord. The lack of modeling and vicarious learning is actually a possible reason why teams with a high degree of virtuality might result in a fragmented form of team efficacy dispersion. In this case, a highly virtual structure reduces the common experience of team members, establishes a fragmented form of team efficacy dispersion, and then helps maintain that fragmented form over time by reducing any opportunity for modeling and vicarious learning.

Finally, Bandura (2001) noted the importance of an individual's metacognitive ability to reflect upon one's actions and performance as an important aspect of developing efficacy beliefs. We posit that these reflection processes are also important at the team level. Namely, we expect that reflection processes influence the extent to which team efficacy beliefs converge over time. To the extent that teams are able to collectively reflect on their teamwork processes and performance in relation to team goals, we would expect a pattern of emerging consensus. Similar effects have been observed in research on team reflexivity and learning. For example, teams that engage in a collective after-action review and reflection process are more likely to learn and develop common mental models of their experience, relative to teams that do not engage in such reflection processes (Ellis & Davidi, 2005; Ellis, Mendel, & Nir, 2006). Likewise, team-level reflexivity promotes greater information sharing and communication among team members (De Dreu, 2007; Gurtner, Tschann, Semmer, & Nagele, 2007). Therefore, when teams are unable to systematically reflect on their actions and performance, either because team members lack the metacognitive ability or because the team context does not allow such reflection (e.g., virtuality, pace of work), we expect a pattern of growing discord to emerge.

Therefore, we propose the following regarding social interactional processes and the trajectory of team efficacy dispersion:

*Proposition 12: Effective (a) communication, (b) modeling, and (c) reflective processes will facilitate an emerging consensus pattern in the trajectory of team efficacy dispersion. A pattern of growing discord in team efficacy dispersion is likely when these team processes are not performed effectively.*

Our theorizing about how social interactional processes shape the evolution of team efficacy beliefs offers a potential explanation for why researchers have found conflicting evidence regarding the convergence in team efficacy beliefs over time. Whereas some scholars have found that

team efficacy beliefs converge towards greater agreement over time (e.g., Baker, 2001; Jung & Sosik, 2003), other scholars have found that team efficacy beliefs do not always converge (e.g., Katz-Navon & Erez, 2005). Those teams who converge to shared efficacy likely engage in effective communication, modeling, and reflection processes, whereas teams that do not converge to a shared efficacy form of dispersion are likely less effective with respect to these social interactional processes.

In this section, we focused on the sources of team efficacy dispersion and the trajectory that the forms of dispersion might exhibit over time. Nevertheless, the patterns of this evolutionary process are potentially quite complex and also worthy of future study. For instance, some teams may shift directly and abruptly from a state of shared efficacy to a bimodal distribution. One potential cause of an immediate shift might be team turnover and the insertion of new members into the team. Yet, for other teams, the path from shared efficacy to bimodal could be indirect and slow. A team might first move from shared efficacy to a state of minority belief. Then, the minority individual may convince another team member of his or her perspective, therefore creating a bimodal distribution in team efficacy. More complex patterns such as these may be a function of social influence behavior or gradual changes in the team or the team's task, which we discuss in the next section of this article. Team size may also be an important consideration here as the complexity of shifting from one form of dispersion to another increases as teams get larger. Future research that examines the causes and consequences of these different evolutionary patterns would be particularly noteworthy.

#### *Boundary Conditions of Dispersion in Team Efficacy*

Thus far, we have discussed the four forms of dispersion in team efficacy and their implications on team functioning without explicitly considering the context within which dispersion occurs. In this section, we begin to delineate the boundary conditions and factors that moderate how dispersion in team efficacy impacts team-level outcomes. Specifically, we identify two moderating factors: task interdependence and social power and influence. It is important to note that we are not suggesting these are the only moderating factors that are relevant to our theory. Nevertheless, given existing theory and research on team dynamics, the moderating factors identified here seem particularly important.

*Task interdependence.* Task interdependence is defined as the degree to which team members must rely on one another to perform their tasks effectively (Georgopoulos, 1986; Kiggundu, 1983; Saavedra, Earley, & Van Dyne, 1993). Existing research suggests that task interdependence impacts team functioning via the level of cooperation, cohesion, and conflict

among team members (Gully, Devine, & Whitney, 1995; Saavedra et al., 1993; Shaw, 1973). These outcomes are contained within the emergent states of trusting and bonding (Ilgen et al., 2005). As task interdependence increases, the requirements for effective coordination, communication, and cooperation among team members also increase in order for the team to perform well (Saavedra et al., 1993; Shea & Guzzo, 1987). Using Thompson's (1967) hierarchy of task interdependence as an organizing framework, we argue here that the greater the interdependence among team members, the greater the potential for dispersion in team efficacy beliefs to negatively impact team effectiveness. In this sense, task interdependence determines the extent to which team effectiveness is sensitive to the effects of dispersion in team efficacy.<sup>2</sup>

Thompson (1967) proposed a hierarchy of task interdependence based on the exchange of information and resources. This hierarchy of pooled, sequential, reciprocal, and team forms of interdependence reflect increasing levels of dependence among individual team members (Thompson, 1967; Van de Ven, Delbecq, & Koenig, 1976). In general, research suggests that the impact of group processes on group outcomes becomes stronger as the team task requires higher levels of interdependence (LePine, Piccolo, Jackson, Mathieu, & Saul, 2008). Under pooled interdependence, each team member makes an independent contribution to the team's output and does so without relying on the input of other team members. In pooled tasks, team members often have similar roles and areas of expertise and contribute parallel outputs independent of one another. Given the lack of task interdependence among team members in a pooled task, the strength of the relationship between dispersion in team efficacy and team effectiveness should be relatively weak. Pooled tasks require less interpersonal interaction for task accomplishment and therefore offer fewer opportunities for any efficacy similarities or differences to emerge and impact team functioning. For instance, in a state of shared efficacy, low task interdependence should limit the degree to which team members benefit from the interpersonal trust and bonds that form as a result of their common efficacy beliefs. In other words, low task interdependence will attenuate the positive effects of shared efficacy. Likewise, in teams with a bimodal form of dispersion, the lack of interdependence inherent in a pooled task should limit the negative effects associated with the team engaging in less

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<sup>2</sup>Task interdependence may also have a direct effect on the form of team efficacy dispersion. For example, task interdependence may impact the amount and quality of communication and modeling that occurs in teams and, by inhibiting these processes, impact the form of team efficacy dispersion that emerges in the team. For this article, we chose to focus on task interdependence as a moderator and the more proximal team processes as antecedents to the form of team efficacy dispersion.

structuring, planning, learning, and adapting. Low interdependence tasks simply require less of these team processes.

On the other hand, as task interdependence increases, the impact of dispersion in team efficacy on team-level outcomes will likely intensify. For instance, under sequential interdependence, one team member must perform his or her task before another team member can act. In sequential tasks, team members have different roles and must perform different parts of the task in a set order for the team to function effectively. Using this sequential form of interdependence, imagine a minority belief form of dispersion where one team member has a team efficacy belief that is much lower than the rest of the team. If this person psychologically withdraws from the team as expected, the team will experience a significant bottleneck problem that severely limits how well the team can perform its task. The scope of this problem will only worsen as task interdependence increases. Yet, in a pooled task, the negative implications of a single team member having low team efficacy would be restricted to that particular team member's output. Therefore, we propose the following:

*Proposition 13: Task interdependence will moderate the relationship between dispersion in team efficacy and team effectiveness such that the impact of each form of dispersion on team effectiveness will be stronger when task interdependence is high and weaker when task interdependence is low.*

*Social power and influence.* People in organizations use social power to directly and indirectly influence the beliefs and actions of other people (Mintzberg, 1983; Pfeffer, 1981). Extending this to team contexts, team members use social power to shape the beliefs and actions of other members. Pfeffer (1992) described social power as “the potential ability to influence behavior, to change the course of events, to overcome resistance, and to get people to do things that they would otherwise not do” (p. 30). Other scholars have described social power in similar terms (e.g., Finkelstein, 1992; French & Raven, 1959; House, 1988; Kurland & Pelled, 2000). Therefore, we define social power as the ability to exert one's will and influence the actions and beliefs of others.

In our theory building thus far, we have assumed that each team member has an equal weight in determining the overall group-level team efficacy belief. Nevertheless, because team members differ in terms of their social power within the team, some team members will have more influence than others over the group-level team efficacy belief. An example would be a formal team leader who has legitimate authority in the team context. We expect that these social power differences among team

members will shape how individual team efficacy beliefs and their associated psychological processes interact and emerge at the team level, especially when team efficacy beliefs are not shared within the team.

Imagine a team where team efficacy beliefs are arranged in a minority belief configuration, where one team member has a meaningfully different team efficacy belief than the rest of the team. If the minority individual has relatively more social power than the rest of the team, this person will be capable of influencing the efficacy beliefs of his or her team members in a way that would not be possible if social power was equal across team members. In other words, a socially powerful team member has a disproportionate amount of influence over the group-level team efficacy belief. Similar effects have been observed in research that suggests charisma, a personal source of social power, enables individuals to shape the beliefs of other people (Conger & Kanungo, 1987; House, 1977). Another example would be research on position power, where formal hierarchical authority enables individuals to shape the beliefs of others. For instance, Watson, Chemers, and Preiser (2001) showed that a formal leader's efficacy beliefs play a key role in shaping team members' efficacy beliefs. Similar research has shown that personal sources of power promote meaningful and durable changes in individuals' belief systems (Koslowsky, Schwarzwald, & Ashuri, 2001; Raven, Schwarzwald, & Koslowsky, 1998).

Not only will socially powerful team members be able to influence others, these individuals should also be more capable of withstanding the influence of majority factions in teams. For example, in the same minority belief team discussed above, a minority individual with low social power might be more apt to conform to the efficacy beliefs of the majority—by way of accepting their goals, expectancies, and views on risk. In contrast, a socially powerful individual who is the minority might resist taking on goals or expectancies that conflict with his or her team efficacy beliefs, therefore intensifying the effect of differences among team members' efficacy beliefs on team functioning. We expect this will be particularly important for shaping which trajectory (emerging consensus or growing discord) teams experience over time. Based on these arguments, we propose the following:

*Proposition 14: Social power will moderate the relationship between dispersion in team efficacy and team effectiveness such that the impact of each form of dispersion on team effectiveness will be stronger when there is greater differentiation among team members in terms of social power and weaker when team members are equal in power.*

### *Discussion*

In this article, we move beyond the traditional view of team efficacy as a construct shared among all team members and provide a much broader understanding of how efficacy beliefs among team members interact and emerge in teams. To conclude, we discuss the implications of our theory for existing and future research on team efficacy, including important methodological issues. We also discuss several important implications for managerial practice.

### *Agenda for Future Research*

Our theory has implications for both existing and future research on team efficacy. The extant literature on team efficacy offers two opposing views on within-team variability in team efficacy. On one hand, within-team variability in team efficacy is a methodological concern that has little explanatory value and should be minimized when examining team efficacy as a group-level phenomenon (e.g., Bandura, 1997; Gully et al., 2002; Guzzo, Yost, Campbell, & Shea, 1993). On the other hand, within-team variability in team efficacy is considered a meaningful construct that has explanatory value and should be systematically researched (e.g., Arthur, Bell, & Edwards, 2007; Moritz & Watson, 1998). In this article, we integrate these two opposing views into a single theory of team efficacy. We extend the debate beyond whether there is an appropriate amount of within-team variability and suggest that not only are the mean and variance of team efficacy beliefs important but also is the form of dispersion in team efficacy. In our taxonomy of dispersion, we incorporate the shared notion of team efficacy (shared efficacy) but then go on to identify several theoretically important forms of dispersion in team efficacy. Together, these forms of dispersion range from low to high within-team variability and illustrate the importance of considering the third (skewness) and fourth (kurtosis) moments of the distribution in group-level team efficacy—both of which are overlooked in the existing literature. In sum, this theory provides an integrative framework that integrates existing literature and provides a conceptual framework for future research on team efficacy.

Researchers interested in further considering the boundary conditions of our theory should consider two issues in particular. First, team members may differ in terms of how aware they are of the dispersion that exists within the team regarding team efficacy beliefs. We would expect team members' awareness of or incorrect assumptions about dispersion in team efficacy to impact how the psychological processes associated with team efficacy emerge at the team level, as well as how our forms of dispersion

in team efficacy impact team processes, states, and effectiveness. For instance, teams whose members have an accurate awareness of the sources and form of dispersion in team efficacy should be more effective at managing and adapting to the dispersion than teams whose members have little awareness or an inaccurate understanding of the dispersion in team efficacy.

Second, we suggest researchers consider how the stage of the team task impacts our theoretical propositions. Bandura (1986, 1997) clearly distinguishes between preparation and performance phases of a task and notes that efficacy affects each phase differently. In the preparatory phase of a task, reflection, learning, skill development, and adaptation are critical processes that teams must engage in to perform effectively. In contrast, the performance phase requires the team to focus more on task execution. Existing research shows that team efficacy as a shared construct positively impacts performance (Gully et al., 2002), but this research focuses exclusively on the performance phase of a task. Very little research has actually focused on the preparatory phase, or better yet differentiated between the preparatory and performance phases of a team task. Research that has examined the role of efficacy in learning-oriented tasks provides a close proxy to preparatory phases of a task, and this research suggests that extremely high magnitudes of team efficacy have negative implications for information search and sharing processes (Kerschreiter et al., 2008; Schulz-Hardt et al., 2000), as well as overall team effectiveness (Vancouver et al., 2001). One way future research could build on the current theory is by differentiating between the preparatory and performance phases of team tasks and examining the effects of dispersion in team efficacy across these different task stages.

Our theory of dispersion in team efficacy also offers a theoretical framework for future research on the broader domain of team emergent states. As noted by Marks, Mathieu, and Zaccaro (2001), team emergent states fall into three different categories: cognitive (e.g., team mental models), motivational (e.g., team efficacy), and affective (e.g., collective mood). The implications of different forms of dispersion need to be considered across each type of emergent state. Team efficacy is a motivational emergent state, and it may be the case that our theory of dispersion in team efficacy extends to other motivational emergent states such as expectancies or team empowerment (e.g., Chen, Kirkman, Kanfer, Allen, & Rosen, 2007). Nevertheless, for other motivational constructs such as valence or instrumentality, it is not clear that our theoretical model explains how dispersion influences team functioning. Likewise, our theory needs to be refined when considering the implications of dispersion for cognitive or affective emergent states. For example, imagine a minority belief configuration for team mental models, a state where one team member has a very

different cognitive understanding of team functioning relative to other team members. Unlike team efficacy, it is not clear what magnitude (i.e., high, low) represents in reference to team mental models, and there is no apparent reason why one team member having a different mental model would lead the minority team member to psychologically withdrawal from (or engage in) team functioning—which is the case with team efficacy. Nonetheless, dispersion is likely an important consideration in the study of these other team emergent states. We encourage future researchers to use our theory of dispersion in team efficacy as a model for examining the role of dispersion across a range of team emergent states.

*Methodological issues.* The study of dispersion in team efficacy presents researchers with several methodological issues and challenges. The first issue is related to measurement, for which there are two predominant approaches in the literature. One approach is a standard measurement approach where individuals “record the strength (magnitude) of their belief on a 100-point scale” (Bandura, 1997). Another approach is using an item response theory framework to determine the optimal rating scale structure for team efficacy (Myers and Feltz, 2007). For the study of dispersion in team efficacy, we recommend using an optimal rating scale structure because, in comparison to a standard measurement approach, a rating scale offers a more accurate true score estimate of within-team variability (Linacre, 2002). Indeed, many of the measures of team efficacy used in recent studies are based on optimal rating and Likert-based scales (e.g., Chen, Thomas, & Wallace, 2005; Hoyt, Murphy, Halverson, & Watson, 2003).

Another methodological challenge in the study of team efficacy dispersion is how best to operationalize the four forms of dispersion. Traditionally, researchers have relied on interrater agreement indices to test how much agreement there is among team members’ efficacy beliefs. Unfortunately, most interrater agreement indices provide no information about the form of dispersion, and these indices can often exhibit inconsistencies across different levels of skewness, variance, and kurtosis (Roberson, Sturman, & Simons, 2007; Smith-Crowe, Burke, & Dunlap, 2004). With this in mind, we offer two specific guidelines for operationalizing the forms of team efficacy dispersion. First, we advocate the use of all four moments of the distribution (mean, variance, skewness, and kurtosis) when assessing which forms of dispersion are present in teams. Mean scores provide information related to the magnitude of team efficacy, and variance provides information regarding how much dispersion is present in the team. Kurtosis and skewness provide information regarding the form of this dispersion. For example, a kurtosis value of  $-2$  indicates a bimodal distribution, whereas a kurtosis value of  $-1.2$  indicates a fragmented form of dispersion (Chissom, 1970).

Second, there are cases where other operationalizations may be needed. For example, in smaller teams, the sample statistics for kurtosis and skewness may be unstable. Therefore, we also propose a novel use of the  $r_{wg}$  statistic for operationalizing the four forms of team efficacy dispersion. The  $r_{wg}$  statistic examines the variance of an observed distribution relative to the expected variance of some null distribution. The basic formula for  $r_{wg}$  equals  $1 - [\text{variance of an observed distribution} / \text{expected variance of a null distribution}]$  (James et al., 1984; James, Demaree, & Wolf, 1993). In most cases,  $r_{wg}$  is used as an agreement index whereby an observed distribution is compared to a null *uniform* distribution, and to the extent that the variance of the observed distribution is less than the variance of a uniform distribution, researchers conclude that there is sufficient agreement among team members. On the other hand, a low  $r_{wg}$  value implies that the observed distribution is similar in form to the null distribution. As James et al. (1984) point out, one advantage of the  $r_{wg}$  statistic is that the observed distribution can be compared to a variety of null distributions. Alternative null distributions (e.g., skewed or bimodal distributions) are most commonly used to model response bias, but we can actually create a null distribution for each of our forms of team efficacy dispersion. Then, we can examine how well an observed distribution of team efficacy scores compares to each of those null distributions. If the  $r_{wg}$  value is high, the observed data refutes the null distribution (whatever form that is), but if the  $r_{wg}$  value is low, the observed distribution matches the null distribution (whatever form that is).

For our forms of team efficacy dispersion, a *uniform* distribution best represents the fragmented form of team efficacy dispersion (little to no agreement among team members). A positively or negatively *skewed* distribution represents our minority belief form of team efficacy dispersion. When the magnitude of team efficacy is high and the form of dispersion is minority belief, a negatively skewed distribution would be used as the null distribution (i.e., the minority has a low team efficacy score). On the other hand, when the magnitude of team efficacy is low and the form of dispersion is minority belief, a positively skewed distribution would be the null distribution (i.e., the minority has a high team efficacy score). Likewise, for our bimodal form of team efficacy dispersion, we can compute the expected variance of any given bimodal distribution and use that as the null distribution in the  $r_{wg}$  formula. The bimodal null distribution would have the greatest variance of all of the null distributions.

For shared efficacy, we propose that scholars should classify teams as shared efficacy if and only if the  $r_{wg}$  value is high for the observed distribution when compared to each of the proposed null distributions. Most prior research has simply used the uniform distribution as the null for determining “agreement” (or in our language, shared efficacy), but it

might be that those teams previously determined to be of shared efficacy were actually minority belief or bimodal (and scholars were just using the wrong null distribution for determining agreement). This issue is similar to LeBreton, James, and Lindell's (2005) discussion of how the  $r_{wg}$  statistic is problematic when the observed distribution is bimodal. The reason for this is because the null distribution upon which the observed distribution is being compared is assumed to be uniform (which would have less overall variance than the observed distribution, resulting in a negative  $r_{wg}$  value). But, if one were to use a bimodal distribution as the basis for computing the variance of the null, this would not be the case. Ultimately, to the extent that an  $r_{wg}$  value is low, scholars can classify teams as whatever form the null distribution represents—therefore providing a way for scholars to systematically operationalize our forms of team efficacy dispersion.

Finally, the operational challenges associated with measuring the forms of team efficacy dispersion bring to light the importance of experimental research where the form of dispersion can be manipulated. Experimental research designs that explicitly compare different forms of dispersion in team efficacy and their impact on team functioning could be particularly insightful. To conduct these experimental studies, researchers will need to find effective ways of manipulating team efficacy beliefs at the individual level such that the different forms of team efficacy dispersion can be constructed.

### *Managerial Implications*

Several important managerial implications are apparent in our theory of dispersion in team efficacy. First, team leaders must develop strategies and tactics for creating and managing dispersion. These strategies and tactics should evolve as the team develops, especially as the team moves from preparatory to performance phases of a task cycle. Bandura (1997) specifically notes that a leader's role is to orchestrate the most advantageous mix of efficacy across both preparatory and performance phases of a task. If past success breeds inflated team efficacy, teams have less incentive to put forth the effort needed to improve their capabilities. Yet, team leaders may want to seek relative consensus in team efficacy upon beginning the performance phase of a team task. We suggest that team leaders adopt several strategies for overcoming dispersion and creating alignment of beliefs within the team. In team deliberations, leaders should use procedures that surface the underlying beliefs and assumptions of individual team members rather than just their stated positions. Sharing information, asking questions about underlying beliefs, interests, or needs, will move teams toward problem solving more quickly. In addition, team leaders should make sure all available information is shared among

team members. The sharing of information will facilitate the use of social persuasion and vicarious experience, both of which might bring team members closer together in their efficacy beliefs.

In addition to strategies for reducing dispersion in team efficacy, team leaders can also develop strategies for using dispersion to a team's advantage. For instance, teams with a very high or low magnitude of team efficacy and who have been in a state of shared efficacy for an extended period of time may become comfortable with failure or complacent in their success. In this way, complacency is encouraged by not having divergent perspectives that encourage team members to think differently about the team's ability to perform its task effectively. To avoid this situation, managers may introduce dispersion in teams by creating a devil's advocate role or by identifying the team member most likely to genuinely have a different perception of team efficacy and encouraging this person to express his or her opinions and beliefs to the team. Both of these interventions have been found to promote more effective group information processing and decision making (Gibson & Saxton, 2005; Valacich & Schwenk, 1995).

Team leaders also have the option of modifying team goals in such a way that disrupts team efficacy and forces the team to reassess its current efficacy beliefs and task strategies. Leaders might also choose to modify the difficulty of team goals over time to bring team members into a state of shared efficacy. In sum, dispersion can have both positive and negative consequences for team effectiveness, and team leaders must have clear strategies for managing team efficacy effectively. Future research that clarifies the team leader's role in managing dispersion in team efficacy would be particularly noteworthy.

### *Concluding Remarks*

Dispersion in team efficacy is not simply a methodological concern for researchers. Instead, dispersion in team efficacy is a worthwhile target of research. We as scholars need to move beyond basic assumptions of agreement and aggregation and conceptualize team efficacy in terms of its magnitude and dispersion. This theory of dispersion in team efficacy offers researchers a framework for conceptualizing dispersion in team efficacy and outlines a research agenda for examining the impact of dispersion in team efficacy on team outcomes. We invite other scholars to extend this theory and begin developing an empirical base of research that tests our theory.

### REFERENCES

- Abrams D, Wetherell M, Cochrane S, Hogg MA, Turner JC. (1990). Knowing what to think by knowing who you are—self-categorization and the nature of norm formation,

- conformity and group polarization. *British Journal of Social Psychology*, 29, 97–119.
- Ancona DG. (1990). Outward bound—strategies for team survival in an organization. *Academy of Management Journal*, 33, 334–365.
- Ancona DG, Caldwell DF. (1992). Bridging the boundary—external activity and performance in organizational teams. *Administrative Science Quarterly*, 37, 634–665.
- Arthur W, Bell ST, Edwards BD. (2007). A longitudinal examination of the comparative criterion-related validity of additive and referent-shift consensus operationalizations of team efficacy. *Organizational Research Methods*, 10, 35–58.
- Azzi AE. (1993). Implicit and category-based allocations of decision-making power in majority minority relations. *Journal of Experimental Social Psychology*, 29, 203–228.
- Baker DF. (2001). The development of collective efficacy in small task groups. *Small Group Research*, 32, 451–474.
- Bales RF, Slater PE. (1955). Role differentiation in small decision making groups. In Parsons T, Bales RF (Eds.), *Family, socialization and interaction process* (pp. 259–306). New York: Macmillan.
- Bandura A. (1982). Self-efficacy mechanism in human agency. *American Psychologist*, 37, 122–147.
- Bandura A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Bandura A. (1993). Perceived self-efficacy in cognitive-development and functioning. *Educational Psychologist*, 28, 117–148.
- Bandura A. (1997). *Self-efficacy: The exercise of control*. New York: W.H. Freeman.
- Bandura A. (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology*, 52, 1–26.
- Bandura A, Cioffi D, Taylor CB, Brouillard ME. (1988). Perceived self-efficacy in coping with cognitive stressors and opioid activation. *Journal of Personality and Social Psychology*, 55, 479–488.
- Barrick MR, Stewart GL, Neubert MJ, Mount MK. (1998). Relating member ability and personality to work-team processes and team effectiveness. *Journal of Applied Psychology*, 83, 377–391.
- Bell BS, Kozlowski SWJ. (2002). A typology of virtual teams—implications for effective leadership. *Group & Organization Management*, 27, 14–49.
- Biddle BJ. (1979). *Role theory: Expectations, identities, and behaviors*. New York: Academic Press.
- Cannon-Bowers JA, Salas E. (1997). A framework for developing team performance measures in training. In Brannick MT, Salas E, Prince C (Eds.), *Team performance assessment and measurement* (pp. 45–62). Mahwah, NJ: Erlbaum.
- Chan D. (1998). Functional relations among constructs in the same content domain at different levels of analysis: A typology of composition models. *Journal of Applied Psychology*, 83, 234–246.
- Chen GL, Kirkman BL, Kanfer R, Allen D, Rosen B. (2007). A multilevel study of leadership, empowerment, and performance in teams. *Journal of Applied Psychology*, 92, 331–346.
- Chen G, Thomas B, Wallace JC. (2005). A multilevel examination of the relationships among training outcomes, mediating regulatory processes, and adaptive performance. *Journal of Applied Psychology*, 90, 827–841.
- Chissom BS. (1970). Interpretation of kurtosis statistic. *American Statistician*, 24, 19–22.
- Conger JA, Kanungo RN. (1987). Toward a behavioral-theory of charismatic leadership in organizational settings. *Academy of Management Review*, 12, 637–647.

- De Dreu CKW. (2007). Cooperative interdependence, task reflexivity, and team effectiveness: A motivated information processing perspective. *Journal of Applied Psychology*, *92*, 628–638.
- Earley PC, Mosakowski E. (2000). Creating hybrid team cultures: An empirical test of transnational team functioning. *Academy of Management Journal*, *43*, 26–49.
- Ellis S, Davidi I. (2005). After-event reviews: Drawing lessons from successful and failed experience. *Journal of Applied Psychology*, *90*, 857–871.
- Ellis APJ, Hollenbeck JR, Ilgen DR, Porter COLH, West BJ, Moon H. (2003). Team learning: Collectively connecting the dots. *Journal of Applied Psychology*, *88*, 821–835.
- Ellis S, Mendel R, Nir M. (2006). Learning from successful and failed experience: The moderating role of kind of after-event review. *Journal of Applied Psychology*, *91*, 669–680.
- Feltz DL, Lirgg CD. (1998). Perceived team and player efficacy in hockey. *Journal of Applied Psychology*, *83*, 557–564.
- Finkelstein S. (1992). Power in top management teams—dimensions, measurement, and validation. *Academy of Management Journal*, *35*, 505–538.
- French JRP, Raven B. (1959). The bases of social power. In Cartwright D (Ed.), *Studies in social power* (pp. 150–167). Ann Arbor: University of Michigan Institute for Social Research.
- Georgopoulos BS. (1986). *Organizational structure, problem solving, and effectiveness*. San Francisco: Jossey-Bass.
- Gibson CB. (1999). Do they do what they believe they can? Group efficacy and group effectiveness across tasks and cultures. *Academy of Management Journal*, *42*, 138–152.
- Gibson CB, Saxton T. (2005). Thinking outside the black box—outcomes of team decisions with third-party intervention. *Small Group Research*, *36*, 208–236.
- Gibson C, Vermeulen F. (2003). A healthy divide: Subgroups as a stimulus for team learning behavior. *Administrative Science Quarterly*, *48*, 202–239.
- Gist ME. (1987). Self-efficacy—implications for organizational-behavior and human-resource management. *Academy of Management Review*, *12*, 472–485.
- Goodman PS, Shah S. (1992). Familiarity and work group outcomes. In Worchel S, Wood W, Simpson JA (Eds.), *Group process and productivity*. Newbury Park, CA: Sage.
- Gruenfeld DH. (1995). Status, ideology, and integrative complexity on the United States Supreme Court—rethinking the politics of political decision making. *Journal of Personality and Social Psychology*, *68*, 5–20.
- Gully SM, Devine DJ, Whitney DJ. (1995). A metaanalysis of cohesion and performance—effects of level of analysis and task interdependence. *Small Group Research*, *26*, 497–520.
- Gully SM, Incalcaterra KA, Joshi A, Beaubien JM. (2002). A meta-analysis of team-efficacy, potency, and performance: Interdependence and level of analysis as moderators of observed relationships. *Journal of Applied Psychology*, *87*, 819–832.
- Gurtner A, Tschan F, Sernmer NK, Nagele C. (2007). Getting groups to develop good strategies: Effects of reflexivity interventions on team process, team performance, and shared mental models. *Organizational Behavior and Human Decision Processes*, *102*, 127–142.
- Guzzo RA, Yost PR, Campbell RJ, Shea GP. (1993). Potency in groups—articulating a construct. *British Journal of Social Psychology*, *32*, 87–106.
- Hackman JR. (1987). The design of work teams. In Lorsch J (Ed.), *Handbook of organizational behavior* (pp. 315–342). New York: Prentice Hall.
- Hogg MA, Terry DJ. (2000). Social identity and self-categorization processes in organizational contexts. *Academy of Management Review*, *25*, 121–140.

- House R. (1977). A 1976 theory of charismatic leadership. In Hunt JG, Larson LL (Eds.), *Leadership: The cutting edge* (pp. 189–207). Carbondale: Southern Illinois University Press.
- House R. (1988). Power and personality in complex organizations. In Staw BM, Cummings LL (Eds.), *Research in organizational behavior*, 10 (pp. 305–357). Greenwich, CT: JAI Press.
- House R, Rousseau DM, Thomas-Hunt M. (1995). The Meso paradigm—a framework for the integration of micro and macro organizational-behavior. *Research in Organizational Behavior*, 17, 71–114.
- Hoyt CL, Murphy SE, Halverson SK, Watson CB. (2003). Group leadership: Efficacy and effectiveness. *Group Dynamics-Theory Research and Practice*, 7, 259–274.
- Ilgen DR. (1999). Teams embedded in organizations—some implications. *American Psychologist*, 54, 129–139.
- Ilgen DR, Hollenbeck JR, Johnson M, Jundt D. (2005). Teams in organizations: From I-P-O models to IMOI models. *Annual Review of Psychology*. Palo Alto, CA: Annual Reviews, Inc.
- Jackson CL, LePine JA. (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.
- James LR, Demaree RG, Wolf G. (1984). Estimating within-group interrater reliability with and without response bias. *Journal of Applied Psychology*, 69, 85–98.
- James LR, Demaree RG, Wolf G. (1993). R(Wg)—an assessment of within-group interrater agreement. *Journal of Applied Psychology*, 78, 306–309.
- Jehn KA, Bendersky C. (2003). Intragroup conflict in organizations: A contingency perspective on the conflict-outcome relationship. *Research in Organizational Behavior*, 25, 187–242.
- Jung DI, Sosik JJ. (2003). Group potency and collective efficacy: Examining their predictive validity, level of analysis, and effects of performance feedback on future group performance. *Group & Organization Management*, 28, 366–391.
- Katz R. (1982). The effects of group longevity on project communication and performance. *Administrative Science Quarterly*, 27, 81–104.
- Katz D, Kahn RL. (1978). *The social psychology of organizations* (2nd ed.). New York: Wiley.
- Katz-Navon TY, Erez M. (2005). When collective- and self-efficacy affect team performance. *Small Group Research*, 36, 437–465.
- Kelly JR, Karau SJ. (1999). Group decision making: The effects of initial preferences and time pressure. *Personality and Social Psychology Bulletin*, 25, 1342–1354.
- Kerschreiter R, Schulz-Hardt S, Mojzisch A, Frey D. (2008). Biased information search in homogeneous groups: Confidence as a moderator for the effect of anticipated task requirements. *Personality and Social Psychology Bulletin*, 34, 679–691.
- Kiggundu MN. (1983). Task interdependence and job design—test of a theory. *Organizational Behavior and Human Performance*, 31, 145–172.
- Kirkman BL, Mathieu JE. (2005). The dimensions and antecedents of team virtuality. *Journal of Management*, 31, 700–718.
- Kirkman BL, Tesluk PE, Rosen B. (2001). Assessing the incremental validity of team consensus ratings over aggregation of individual-level data in predicting team effectiveness. *PERSONNEL PSYCHOLOGY*, 54, 645–667.
- Klein KJ, Conn AB, Smith DB, Sorra JS. (2001). Is everyone in agreement? An exploration of within-group agreement in employee perceptions of the work environment. *Journal of Applied Psychology*, 86, 3–16.
- Kozlowski SWJ, Bell BS. (2003). Work groups and teams in organizations. In Borman WC, Ilgen DR, Klimoski R (Eds.), *Handbook of psychology: Industrial and organizational psychology*, 12 (pp. 333–375). London: Wiley.

- Kozlowski SWJ, Klein KJ. (2000). A multilevel approach to theory and research in organizations: Contextual, temporal, and emergent processes. In Klein KJ, Kozlowski SWJ (Eds.), *Multilevel theory, research, and methods in organizations: Foundations, extensions, and new directions* (pp. 3–90). East Lansing, MI: Michigan State University.
- Kozlowski SWJ, Gully SM, Nason ER, Smith EM. (1999). Developing adaptive teams: A theory of compilation and performance across levels and time. In Ilgen DR, Pulakos ED (Eds.), *The changing nature of performance: Implications for staffing, motivation, and development* (pp. 240–292). San Francisco: Jossey-Bass.
- Kozlowski M, Schwarzwald J, Ashuri S. (2001). On the relationship between subordinates' compliance to power sources and organizational attitudes. *Applied Psychology-An International Review*, 50, 455–476.
- Krueger N, Dickson PR. (1994). How believing in ourselves increases risk-taking—perceived self-efficacy and opportunity recognition. *Decision Sciences*, 25, 385–400.
- Kurland NB, Pelled LH. (2000). Passing the word: Toward a model of gossip and power in the workplace. *Academy of Management Review*, 25, 428–438.
- Latane B, Wolf S. (1981). The social impact of majorities and minorities. *Psychological Review*, 88, 438–453.
- Lau DC, Murnighan JK. (1998). Demographic diversity and faultlines: The compositional dynamics of organizational groups. *Academy of Management Review*, 23, 325–340.
- Lau DC, Murnighan JK. (2005). Interactions within groups and subgroups: The effects of demographic faultlines. *Academy of Management Journal*, 48, 645–659.
- Laughlin PR. (1999). Collective induction: Twelve postulates. *Organizational Behavior and Human Decision Processes*, 80, 50–69.
- Lawler EE, Mohrman SA, Ledford GE. (1995). *Creating high performance organizations: Practices and results of employee involvement and TQM in Fortune 1000 companies*. San Francisco: Jossey-Bass.
- LeBreton JM, James LR, Lindell MK. (2005). Recent issues regarding  $r(WG)$ ,  $r^*(WG)$ ,  $r(WG)(J)$ , and  $r^*(WG)(J)$ . *Organizational Research Methods*, 8, 128–138.
- LePine JA, Piccolo RF, Jackson CL, Mathieu JE, Saul JR. (2008). A meta-analysis of teamwork processes: Tests of a multidimensional model and relationships with team effectiveness criteria. *PERSONNEL PSYCHOLOGY*, 61, 273–307.
- Li JT, Hambrick DC. (2005). Factional groups: A new vantage on demographic faultlines, conflict, and disintegration in work teams. *Academy of Management Journal*, 48, 794–813.
- Liang DW, Moreland R, Argote L. (1995). Group versus individual training and group performance—the mediating role of transactive memory. *Personality and Social Psychology Bulletin*, 21, 384–393.
- Linacre JM. (2002). Optimizing rating scale category effectiveness. *Journal of Applied Measurement*, 3, 85–106.
- Lindell MK, Brandt CJ. (1997). Measuring interrater agreement for ratings of a single target. *Applied Psychological Measurement*, 21, 271–278.
- Lindsay DH, Brass DJ, Thomas JB. (1995). Efficacy-performance spirals—a multilevel perspective. *Academy of Management Review*, 20, 645–678.
- Littlepage G, Robison W, Reddington K. (1997). Effects of task experience and group experience on group performance, member ability, and recognition of expertise. *Organizational Behavior and Human Decision Processes*, 69, 133–147.
- Marks MA, Mathieu JE, Zaccaro SJ. (2001). A temporally based framework and taxonomy of team processes. *Academy of Management Review*, 26, 356–376.

- Marrone JA, Tesluk PE, Carson JB. (2007). A multilevel investigation of antecedents and consequences of team member boundary-spanning behavior. *Academy of Management Journal*, 50, 1423–1439.
- Meyer WU. (1987). Perceived ability and achievement-related behavior. In Halisch F, Kuhl J (Eds.), *Motivation, intention and volition* (pp. 73–86). Berlin: Springer-Verlag.
- Miller JG, Miller JL. (1992). Cybernetics, general systems theory, and living systems theory. In Levine RL, Fitzgerald HE (Eds.), *Analysis of dynamic psychological systems, 1* (pp. 9–34). New York: Plenum.
- Mintzberg H. (1983). *Power in and around organizations*. Englewood Cliffs, NJ: Prentice-Hall.
- Morgeson FP, Hofmann DA. (1999). The structure and function of collective constructs: Implications for multilevel research and theory development. *Academy of Management Review*, 24, 249–265.
- Moritz SE, Watson CB. (1998). Levels of analysis issues in group psychology: Using efficacy as an example of a multilevel model. *Group Dynamics: Theory, Research, and Practice*, 2, 285–298.
- Mortensen M, Hinds PJ. (2001). Conflict and shared identity in geographically distributed teams. *International Journal of Conflict Management*, 12, 212–238.
- Moscovici S. (1980). Toward a theory of conversion behavior. In Berkowitz L (Ed.), *Advances in experimental social psychology*, 13 (pp. 209–242). San Diego, CA: Academic Press.
- Moscovici S. (1985). Social influence and conformity. In Lindzey G, Aronson E (Eds.), *Handbook of social psychology*, 2 (pp. 347–412). Reading, MA: Addison-Wesley.
- Mugny DG. (1982). *The power of minorities*. San Diego, CA: Academic Press.
- Myers ND, Feltz DL. (2007). From self-efficacy to collective efficacy in sport: Transitional issues. In Tenenbaum G, Eklund RC (Eds.), *Handbook of sport psychology* (3rd ed.). New York: Wiley.
- Nemeth CJ. (1986). Differential contributions of majority and minority influence. *Psychological Review*, 93, 23–32.
- O'Reilly CA, Caldwell DF, Barnett WP. (1989). Work group demography, social integration, and turnover. *Administrative Science Quarterly*, 34, 21–37.
- Pfeffer J. (1981). *Power in organizations*. Marshfield, MA: Pitman.
- Pfeffer J. (1992). *Managing with power: Politics and influence in organizations*. Boston: Harvard Business School Press.
- Prussia GE, Kinicki AJ. (1996). A motivational investigation of group effectiveness using social-cognitive theory. *Journal of Applied Psychology*, 81, 187–198.
- Raven BH, Schwarzwald J, Koslowsky M. (1998). Conceptualizing and measuring a power/interaction model of interpersonal influence. *Journal of Applied Social Psychology*, 28, 307–332.
- Rentsch JR, Heffner TS, Duffy LT. (1994). What you know is what you get from experience—team experience related to teamwork schemas. *Group & Organization Management*, 19, 450–474.
- Riggs ML, Knight PA. (1994). The impact of perceived group success failure on motivational beliefs and attitudes—a causal model. *Journal of Applied Psychology*, 79, 755–766.
- Roberson QM, Sturman MC, Simons TL. (2007). Does the measure of dispersion matter in multilevel research? A comparison of the relative performance of dispersion indexes. *Organizational Research Methods*, 10, 564–588.
- Rousseau DM. (1985). Issues of level in organizational research: Multi-level and cross-level perspectives. In Staw BM, Cummings LL (Eds.), *Research in organizational behavior* (pp. 1–37). Greenwich: JAI Press.

- Saavedra R, Earley PC, Van Dyne L. (1993). Complex interdependence in task-performing groups. *Journal of Applied Psychology*, 78, 61–72.
- Schachter S. (1951). Deviation, rejection, and communication. *Journal of Abnormal and Social Psychology*, 46, 190–207.
- Schmidt FL, Hunter JE, Outerbridge AN. (1986). Impact of job experience and ability on job knowledge, work sample performance, and supervisory ratings of job-performance. *Journal of Applied Psychology*, 71, 432–439.
- Schulz-Hardt S, Frey D, Luthgens C, Moscovici S. (2000). Biased information search in group decision making. *Journal of Personality and Social Psychology*, 78, 655–669.
- Shaw ME. (1973). Scaling group tasks: A method for dimensional analysis. *JSAS Catalog of Selected Documents in Psychology*, 3, MS No. 294.
- Shea GP, Guzzo RA. (1987). Group effectiveness—what really matters. *Sloan Management Review*, 28, 25–31.
- Slater PE. (1955). Role differentiation in small groups. *American Sociological Review*, 20, 300–310.
- Smith KG, Smith KA, Olian JD, Sims HP, Obannon P, Scully JA. (1994). Top management team demography and process—the role of social integration and communication. *Administrative Science Quarterly*, 39, 412–438.
- Smith-Crowe K, Burke MJ, Dunlap WP. (2004, April). A Note on when rWG and AD interrater agreement indices disagree. Paper presented at the 19th Annual Conference of the Society for Industrial and Organizational Psychology, Chicago, IL.
- Tanford S, Penrod S. (1984). Social-influence model—a formal integration of research on majority and minority influence processes. *Psychological Bulletin*, 95, 189–225.
- Thompson JD. (1967). *Organizations in action*. New York: McGraw-Hill.
- Valacich JS, Schwenk C. (1995). Devils advocacy and dialectical inquiry effects on face-to-face and computer-mediated group decision-making. *Organizational Behavior and Human Decision Processes*, 63, 158–173.
- Van de Ven AH, Delbecq AL, Koenig R, Jr. (1976). Determinants of coordination modes within organizations. *American Sociological Review*, 41, 322–338.
- Van Knippenberg D, De Dreu CKW, Homan AC. (2004). Work group diversity and group performance: An integrative model and research agenda. *Journal of Applied Psychology*, 89, 1008–1022.
- Vancouver JB, Thompson CM, Williams AA. (2001). The changing signs in the relationships among self-efficacy, personal goals, and performance. *Journal of Applied Psychology*, 86, 605–620.
- Watson CB, Chemers MM, Preiser N. (2001). Collective efficacy: A multilevel analysis. *Personality and Social Psychology Bulletin*, 27, 1057–1068.
- Weick KE. (1993). The collapse of sensemaking in organizations: The Mann gulch disaster. *Administrative Science Quarterly*, 38, 628–652.
- Welbourne TM, Johnson DE, Erez A. (1998). The role-based performance scale: Validity analysis of a theory-based measure. *Academy of Management Journal*, 41, 540–555.
- Wittenbaum GM, Stasser G. (1996). Management of information in small groups. In Nye JL, Brower AM (Eds.), *What's social about social cognition*. Thousand Oaks: Sage.
- Wood W, Lundgren S, Ouellette JA, Busceme S, Blackstone T. (1994). Minority influence—a meta-analytic review of social-influence processes. *Psychological Bulletin*, 115, 323–345.
- Zaccaro SJ, Rittman AL, Marks MA. (2001). Team leadership. *Leadership Quarterly*, 12, 451–483.
- Zenger TR, Lawrence BS. (1989). Organizational demography—the differential-effects of age and tenure distributions on technical communication. *Academy of Management Journal*, 32, 353–376.