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Do You See What We See? The Complex Effects of Perceptual Distance Between Leaders and Teams

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Previous distance-related theories and concepts (e.g., social distance) have failed to address the sometimes wide disparity in perceptions between leaders and the teams they lead. Drawing from the extensive literature on teams, leadership, and cognitive models of social information processing, the authors develop the concept of *leader–team perceptual distance*, defined as differences between a leader and a team in perceptions of the same social stimulus. The authors investigate the effects of perceptual distance on team performance, operationalizing the construct with 3 distinct foci: goal accomplishment, constructive conflict, and decision-making autonomy. Analyzing leader, member, and customer survey responses for a large sample of teams, the authors demonstrate that perceptual distance between a leader and a team regarding goal accomplishment and constructive conflict have a nonlinear relationship with team performance. Greater perceptual differences are associated with decreases in team performance. Moreover, this effect is strongest when a team's perceptions are more positive than the leader's are (as opposed to the reverse). This pattern illustrates the pervasive effects that perceptions can have on team performance, highlighting the importance of developing awareness of perceptions in order to increase effectiveness. Implications for theory and practice are delineated.

Keywords: teams, leadership, social perception, collective cognition

Work teams, defined as a group of members with interdependent interaction and mutually shared responsibility for achieving specified outcomes (Cohen & Bailey, 1997), are complex social systems with a central role in organizations striving for innovation (Edmondson, 2002), efficiency (Cohen & Bailey, 1997), or broad access to stakeholders (Gluesing & Gibson, 2003). There is a long history of research investigating what contributes to the effectiveness of work teams; much of this research has involved gathering perceptions from leaders, members, or customers about inputs, processes, and outputs to assess teams (Gibson & Zellmer-Bruhn, 2001; Marks, Mathieu, & Zaccaro, 2001). An interesting observation is that different stakeholders do not always see eye to eye (Cardy & Dobbins, 1994; Murphy & Cleveland, 1991; Salam, Cox, & Sims, 1997). However, a construct that captures these perceptual differences between leaders and teams has not yet been empirically examined, even though other distance-related concepts (e.g., social distance) have shown important effects. In fact, team researchers and practitioners often have treated these discrepancies in perceptions as "errors" (Bliese, 2000; Tinsley & Weiss, 1975; Toegel & Conger, 2003) and have spent little effort in studying them as the phenomenon of interest.

Importantly, differences in perception between teams and their leaders may create precarious situations. For example, consider a process improvement team that Cristina B. Gibson observed. At an abstract level, there was agreement about what the team needed to accomplish to improve processes; however, the team and the leader to whom the team reported had very divergent perspectives regarding the actual progress made to date. These differing viewpoints produced critical differences of opinion about the necessary priorities moving forward. As a result, the team and leader reached a considerable stalemate over how to proceed. Customer initiatives failed because the team did not make the changes necessary to meet emerging customer preferences, and the team's performance declined to a point at which they failed to meet targets.

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Leadership and team processes reciprocally influence each other (Zaccaro, Rittman, & Marks, 2001), and as the prior anecdote indicates, it is necessary for a team and its leader to develop an awareness of each other's perspective. In this article we use the concept of *leader–team perceptual distance*, defined as differences between a leader and a team in perceptions of the same social stimulus, to examine such scenarios. Drawing from the team leadership model proposed by Zaccaro et al. (2001), we assume that leaders influence team effectiveness through their effects on four general types of team processes: cognitive, motivational, affective, and coordination. In developing our argument, we focus on team cognitive processes and argue that leader–team perceptual differences are detrimental to team performance because these differences hinder the team from maximizing collective cognition and reaching its full potential (Gibson, 2001).

The general research question that we address is, What are the consequences of leader–team perceptual distance for team performance? We begin by defining the concept of perceptual distance and showing how it is distinct from concepts previously put forth in the literature. Second, we review the literature on collective cognition to provide an integrative theoretical framework to support our hypotheses. Third, we use three distinct phenomena (i.e., goal accomplishment, constructive conflict, and decision-making autonomy) to outline specific hypotheses regarding perceptual distance operationalized. Fourth, using survey data from a large sample of teams, their leaders, and customers representing six organizations and four cultural regions, we test these hypotheses. We conclude by describing the implications of our model for theory, research, and practice.

Perceptual Distance Between a Leader and a Team

Perception is a form of problem solving (Shaver, 1975). According to social perceptual theory (Allport, 1955), human beings experience other individuals phenomenologically because of the complexity of social stimuli and limitations in our information-processing capabilities. The perceptual process is influenced by many individual differences, including variations in experience, personality, and cognitive complexity, which in turn influence interests, values, and mental scripts (Wyer & Srull, 1989). These factors shape the frames and lenses through which people perceive and interpret the world, leading them to attend to certain stimuli but filter out others, or to recall some features and fail to mentally store others (John & Robbins, 1994). Given that individuals who work together in organizations often vary dramatically in experience, personality, skills, and values (Harrison, Price, & Bell, 1998; Harrison, Price, Gavin, & Florey, 2002; Lawrence, 1997; Riordan, 2000) and that the motivation to attend to stimuli may vary (Shaver, 1975), any given set of perceivers may have different perceptions of the same phenomenon in the workplace; research implies that teams and their external leaders may be particularly prone to forming differing perceptions (Bass & Yammarino, 1991; McCauley & Lombardo, 1990; Van Velsor, Taylor, & Leslie, 1993).

Notably, perceptions help shape behavioral inputs into team processes. In fact, it is likely that team phenomena as perceived—not as they occur in any objective sense—are a crucial component for explaining team outcomes, alongside other important inputs and processes. For example, Lord, Phillips, and Rush (1980) partitioned variance in ratings of team leader behavior into three components: subjects' group context, the leader being rated, and the group member actually doing the perceiving and rating. Group context explained between 10 and 27 percent of the variance in ratings on measures of leadership. Leader effects explained between 19 and 52 percent of the variance. But consistent with the perceptual view, perceiver effects were nearly just as important, explaining between 17 and 44 percent of the variance in ratings.

The concept of *perceptual distance* captures the degree to which there are significant variations in perceptions of the same social stimulus. Large perceptual distances imply great variations in perceptions of the same stimulus, whereas small perceptual distances imply only small differences in perceptions. We focus on how much a leader's perceptions (i.e., the perceptions of the leader external to the team, to whom the team reports) differ from the perceptions of the team he or she leads and how these differences relate to team performance. Our general hypothesis is that agreement between the leader and team will result in the highest level of team performance. We offer specific hypotheses about different perceptual phenomena in subsequent sections, including more detailed predictions about the nature of agreement and performance. Admittedly, perceptions may differ among team members within the same team or between the team and other parties (such as support staff or other teams in the organization). We discuss how our concept is distinct from these types of perceptual differences in the next section. Even after controlling for within-team perceptual distance, one finds that leader–team perceptual distance can have particularly serious consequences. In our discussion, we address the potential implications of our findings for other types of perceptual differences.

Differentiation From Other Perceptual Concepts

Our conceptualization of leader–team perceptual distance is a unique extension of earlier theorizing on leader–member exchange, cognitive congruence, and distance-related concepts. For example, there is a precedent in the literature on leader–member exchange to examine similarities and differences in perceptions between a supervisor and a subordinate (e.g., Greene, 1972; Hatfield & Huseman, 1982; Turban & Jones, 1988; Wexley, Alexander, Greenawalt, & Couch, 1980). These studies assessed *perceptual congruence*, defined as the similarity of perceptions held by a supervisor as compared with those by a subordinate regarding factors such as communication behaviors between the supervisor and subordinate (Hatfield & Huseman, 1982), activities necessary for fulfilling the subordinate's job role (i.e., role accuracy; Greene, 1972), or requirements for the subordinate to get a merit raise (Turban & Jones, 1988) and found that differences in perceptions matter at the dyadic level (e.g., Engle & Lord, 1997). However, this research is also limited by several shortcomings. None of these studies employed dependent variables that were assessed by someone other than the two parties in the focal dyad. Much of this research relied on simple statistical techniques such as correlation (Greene, 1972; Wexley et al., 1980) and also assumed these perceptual issues were an inherently dyadic-level phenomenon. Hence, the current research builds on this by looking past the dyadic level to assess the effects of perceptual differences between leaders and teams.

Our concept of leader–team perceptual distance also has certain parallels to the construct of *social distance* in the leadership

literature (Shamir, 1995) but describes a different dimension of social perception. The term *social distance* refers to the effects of leaders on subordinates or followers at varying degrees of hierarchical organizational distance. Subordinates who comprise the leader's most immediate circle of relationships presumably have different perceptions of a leader than do subordinates who do not have direct contact with the leader (Shamir, 1995). Our conceptualization of *perceptual distance* differs in that it is not examining distances in a hierarchy but rather differences in perceptions.

In the literature on top management teams, a parallel concept to leader–team perceptual distance is the notion of *cognitive heterogeneity* (Hambrick & Mason, 1984). *Cognitive heterogeneity* refers to wide differences in viewpoints or worldviews within a top management team regarding what the organization seeks to accomplish, and the term is used narrowly to describe within-team consensus around strategic positioning or the dominant logic of the firm's business model. Our concept of leader–team perceptual distance is broader than the concept of team cognitive heterogeneity, encompassing many different perceptual phenomena beyond just organizational goals or strategic positioning, and is applicable to teams at all hierarchical levels, not just top management teams. Finally, as mentioned earlier, we focus specifically on the dynamic between a leader and a team rather than the dynamic *within* a team. In the next section, we delineate why we expect these leader–team differences will cause a breakdown in the team process.

Leader–Team Perceptual Distance as an Impediment to Collective Cognition

Most group research is based on an input-process-output model. *Process* describes those things that go on in the group that influence effectiveness (Campion, Medsker, & Higgs, 1993), and research has found that leaders influence team effectiveness through their effects on group processes (see Zaccaro et al., 2001, for a review). Although there are various types of group processes (e.g., affective), the current focus is on cognitive processes. We specifically examine how leader–team interactions can influence these cognitive group processes and ultimately affect team performance.

A team possesses cognitive properties that are distinct from a combination of the cognitions of individual members, referred to as *collective cognition* (Hinsz, Tindale, & Vollrath, 1997). Research on information processing, group development, and communication indicates that collective cognition can be conceptualized by at least four process phases: accumulation, interaction, examination, and accommodation (Argyris & Schön, 1978; Gibson, 2001; Goodman, Ravlin, & Schminke, 1990; Jewell & Reitz, 1988; Kolb, 1984; von Cranach, Ochsenbein, & Valach, 1986). In turn, each of these phases appears to be comprised of several key subprocesses (Gibson & Earley, 2007; Hinsz et al., 1997; Sniezek & Henry, 1990). During accumulation, groups acquire, perceive, filter, and store information. The interaction phase consists of retrieving, exchanging, and structuring information. During examination, members negotiate, interpret, and evaluate information. Finally, accommodation occurs as groups integrate, decide, and act on the information. Although research suggests that most groups engage in each of the major process phases to some extent, the degree to which each subprocess is undertaken seems to vary among groups, as does the time spent on any given phase (Corner, Kinicki, & Keats, 1994; Gersick, 1988; Hutchins, 1991). Movement from one major process phase to another is sometimes linear and sequential, but there can also be reciprocal relationships among the phases and even a reversal of the cycle (Argyris, 1976; Gibson, 2001; Gibson & Earley, 2007; Hinsz et al., 1997).

The cognitive properties of groups, including efficient movement through cycles of collective cognition, serve as significant predictors of group effectiveness (see Gibson & Earley, 2007, for a review). Thus, it is critical that teams progress through the phases of collective cognition in order to reach their full potential. We expect differences in leader–team perceptions to be detrimental to collective cognition because the misunderstandings that arise distract the parties involved and use up valuable resources (e.g., time, energy, possibly even capital) that could otherwise be applied directly to achieving performance objectives. More specifically, we believe greater levels of perceptual distance deters the team from utilizing needed catalysts to collective cognition. Catalysts—such as feedback received about performance, recognition of conflict among members, and clarification of decision-making roles—"serve as levers . . . to move groups forward through the cognitive cycle" (Gibson, 2001; p. 131). Recent theorizing suggests that teams progress through the phases of collective cognition by making use of catalysts to break apart routine and habitual patterns of information use and behavior (Gibson & Earley, 2007). It is the effect of perceptual distance on these catalytic mechanisms that comprises the core of our argument. A leader can assist a team in making use of catalysts, but if the leader and the team do not have common perceptions of relevant phenomena, they are unlikely to take advantage of them. Below, we discuss the interaction of these three catalytic forces with perceptual distance regarding three team phenomena.

Perceptual Distance and Team Performance

Teams and their leaders must communicate, coordinate, and interact regarding a myriad of issues related to work output and team functioning. Here we test the effects of perceptual distance across three phenomena rather than focus on only one, in order to determine whether the construct is as robust as our theorizing would imply.[1] We focus on three aspects of teams that prior literature has shown can have particularly pervasive effects: goal accomplishment, constructive conflict, and decision-making autonomy (Marks et al., 2001; O'Leary-Kelly, Martocchio, & Frink, 1994; Stewart & Barrick, 2000). Leader and team perceptions of these phenomena also play a critical role in the ability of a team to make use of catalysts for collective cognition. The dependent variable of interest is team performance. Team performance is a common outcome variable in the literature and is generally assessed in terms of quantity and quality of outputs (Cohen & Bailey, 1997; Lim & Ployhart, 2004; Stewart & Barrick, 2000). Our operationalization of team performance (described later) includes these same basic facets and, thus, is comparable to those used in prior research. We test the relationship of leader perceptions, team perceptions, and team performance with polynomial regression analysis and, ultimately, view the pattern of these constructs in three dimensions (Edwards, 1994, 2002). In accordance with this method, we hypothesize the full functional form of each relationship in the following sections.

[1] In the Discussion section we suggest additional focal stimuli that may be of interest.

Leader–Team Perceptual Distance Regarding Goal Accomplishment

Goals play a particularly central role in most theories of team effectiveness (e.g., Earley & Gibson 2002; O'Leary-Kelly et al., 1994). A long history of research has examined how leaders can best set goals for teams (see Locke & Latham, 1990, for a review), as well as issues surrounding goal congruence, which pertains to similarity in the understanding of goals (e.g., Kristof-Brown & Stevens, 2001), and goal acceptance, which pertains to whether assignees have adopted and internalized goals (e.g., Donovan & Rodosevich, 1998). These characteristics are typically captured prior to performance attempts at goal accomplishment. For example, Kristof-Brown and Stevens (2001) examined how goal congruence affected individual outcomes in 64 short-term project teams and found that goal congruence elicited greater individual satisfaction and contributions, regardless of goal strength (i.e., high or low personal performance goals). This study suggests that indeed it is important to assess perceptions of goals in team settings and that effects of these perceptions are very complex. However, rather than examining perceptions of goals prior to performance, we instead focus on the dynamic understanding in ongoing teams of the degree to which the team has accomplished goals. To our knowledge, researchers have yet to explore differences in perceptions of goal accomplishment, even though such differences are common (London & Smither, 1995).

Perceptions of goal accomplishment are important in determining how well a team will make use of feedback-related catalysts for collective cognition. Effective use of detailed and specific feedback indicating how well a team is doing on particular aspects of tasks or targets enables teams to move from the first phase of collective cognition, accumulation (in which information is perceived, filtered, and stored), to the next phase, interaction (in which information is exchanged and structured; Gibson, 2001). Effective use of specific feedback also enables social comparison processes, in which the behavior of the focal team is compared with that of some other team. These processes enable teams to move from the examination phase of collective cognition (in which information is negotiated, interpreted, and evaluated) to subsequent phases (in which information is incorporated into behavior; Gibson, 2001). When leaders and teams have similar perceptions of the general degree to which they have accomplished their objectives, they can make better use of more fine grained information obtained through feedback and social comparison and move more effectively through the cycles of collective cognition to enhance performance. These critical processes are derailed when a leader and a team disagree about the team's level of goal accomplishment. Disagreements may occur when the leader and the team have different access to information, divergent interpretations of the same information, or differing comparison referents for the team. Further, team performance should be highest when goal accomplishment is considered by both parties to be high, rather than low. Perceived accomplishments serve as motivators and reinforcements that help direct and maintain behavior toward continued performance efforts (Locke & Latham, 1990). Notably, these predictions at the team level of analysis are also implied by Atwater, Ostroff, Yammarino, and Fleenor (1998), who found similar patterns when studying self–other ratings of managerial performance (i.e., at the individual level).

When the leader and team disagree about what the team has accomplished, this results in confusion about whether gathering additional performance information is necessary, and the team may have difficulty understanding how it compares with other teams, making it difficult to determine how to proceed or what priorities to establish. We expect these effects to be most detrimental when the team perceives greater goal accomplishment than does the leader. In this circumstance, the team will likely consider its knowledge accumulation sufficient and discontinue additional search and storage, while the leader may see the need for more knowledge accumulation about task requirements, errors, or parameters. Under this scenario, the leader is likely to provide feedback to the team that they have fallen short of their goals. Such feedback, however, may not be received well. Receiving constructive criticism when we believe we are performing well can be ego threatening, particularly in a social and evaluative setting (Earley & Randel, 1997). Empirical evidence shows that poorer than expected feedback can lead to negative emotions, which are followed by a reduction in the motivation to change, denial of the usefulness of feedback, and questioning of its accuracy (Atwater, Waldman, Atwater, & Cartier, 2000; Atwater, Waldman, & Brett, 2002). Negative feedback from leaders therefore, even if accurate, can produce dissatisfaction and frustration in this situation (Podsakoff & Fahr, 1989). As a result, the team may react to their leader's negative feedback by failing to incorporate it into behavioral repertoires (Edmondson, 2002).

When the leader perceives greater goal accomplishment than does the team, this lack of congruence may still create problems for the team, but the resulting dynamics may be less detrimental for team performance than if the team's perception is higher. If the leader perceives greater goal accomplishment, he or she may no longer assist the team in knowledge accumulation efforts. However, this inaction is likely to be temporary and transient, lasting only until the team falters. By contrast, when the team perceives greater goal accomplishment than does the leader, the negative reactions of the leader are likely to elicit negative emotions such as dissatisfaction and frustration, which could be enduring. The following hypotheses reflect these ideas:

> *Hypothesis 1a:* The more aligned a leader's and his or her team's perceptions are about goal accomplishment (i.e., lower levels of perceptual distance), the better a team will perform.
>
> *Hypothesis 1b:* Team performance will be highest when the leader's and the team's perceptions of goal accomplishment are aligned and high rather than aligned and low (i.e., perceptual distance is low and perceptions of goal accomplishment are high rather than low).
>
> *Hypothesis 1c:* Team performance will be lower when the team's perceptions of goal accomplishment are greater than the leader's perceptions rather than when the leader's perceptions are greater than the team's perceptions (i.e., if perceptual distance exists, the magnitude of the effect will be greater if the team rates goal accomplishment higher than does the leader).

Leader–Team Perceptual Distance Regarding Constructive Conflict

A second catalyst advanced in models of collective cognition is the recognition of conflict—an awareness on the part of the parties involved of discrepancies, incompatible wishes, or irreconcilable desires between members (Jehn & Mannix, 2001). Conflict is an inherent aspect of group functioning, and a long line of research has illustrated that teams need to manage conflict carefully in order to garner potential benefits and avoid possible risks (e.g., Jehn, 1995; Jehn & Mannix, 2001). In terms of collective cognition, constructive conflict prompts examination activities (i.e., negotiating, interpreting, and evaluating knowledge). When conflict has been addressed constructively, this enables consensus (agreement within the team), which results in better integration of knowledge into action (i.e., accommodation activities; Gibson, 2001; Marks et al., 2001). Both conflict and consensus can be good for a team, because each moves the team forward through the cognitive cycle and toward greater effectiveness. Yet, when the leader and the team perceive differing amounts of constructive conflict, this perceptual distance regarding the degree to which constructive conflict is occurring deters the team from utilizing this catalyst. Hence, any lack of perceptual congruence may create problems.

That said, team performance should be highest when the leader's and the team's perceptions agree and when constructive conflict is considered to be high rather than low, since constructive conflict benefits team performance (Gladstein, 1984; Seers, Petty, & Cashman, 1995). Gladstein (1984) found that group ratings of the openness of communication and supportiveness associated with conflict resolution were positively associated with group ratings of satisfaction and performance. More recently, Seers et al. (1995) found that the level of reciprocal collaborative and cooperative efforts within a team was highly related to group production efficiency.

For teams that have external leaders, these leaders may play a pivotal role in the management of team conflict (Zaccaro et al., 2001). When a leader realizes that a team needs assistance in managing conflicts, he or she can play important boundary spanning and linking roles (Mohrman, Cohen, & Mohrman, 1995), helping expose the team to new knowledge sources and enabling greater variety of information to be gathered and shared (Edmondson, 2002). If a leader perceives that the team is handling conflict constructively (i.e., the leader perceives more constructive conflict than does the team), he or she is unlikely to engage in these activities, and this may hinder performance.

However, when the leader believes the team is not handling conflict constructively (i.e., when the leader perceives less constructive conflict than does the team), we expect that he or she may provide unnecessary intervention that will be more detrimental to team performance than would lack of intervention. If the leader perceives that the team is troubled with disruptive, unproductive conflicts, whereas team members are comfortable with their interaction norms and satisfied with how disagreements are being handled, the leader may be inclined to actively intervene where he or she is not needed, to the confusion and/or annoyance of team members, who feel their conflict is constructive. As with the logic underlying goal accomplishment, this unnecessary intervention could be demoralizing for a team that perceives it is functioning well, hindering the team from moving forward through consensus to reach the accommodation stage of collective cognition and ultimately decreasing performance. The following hypotheses reflect these ideas:

> *Hypothesis 2a:* The more aligned a leader's and a team's perceptions about constructive conflict are (i.e., lower levels of perceptual distance), the better a team will perform.
>
> *Hypothesis 2b:* Team performance will be highest when the leader's and the team's perceptions of constructive conflict are aligned and high rather than aligned and low (i.e., perceptual distance is low and perceptions of constructive conflict are high rather than low).
>
> *Hypothesis 2c:* Team performance will be lower when the team's perceptions of constructive conflict are greater than the leader's perceptions rather than when the leader's perceptions are greater than the team's perceptions (i.e., if perceptual distance exists, the magnitude of the effect will be greater if the team rates constructive conflict higher than does the leader).

Leader–Team Perceptual Distance Regarding Decision-Making Autonomy

A final catalyst advanced in models of collective cognition involves establishing decision-making roles (Gibson, 2001). When roles are clearly defined, each member understands where expertise, responsibility, and accountability lie within the team. In the process of collective cognition, teams with clear decision-making roles are able to move past accumulation activities and engage in the interaction phase (i.e., retrieving, exchanging, and structuring information) and examination activities, during which they interpret and evaluate information gathered. Stated differently, once a team has clearly defined roles and responsibilities, this serves as a catalyst to advance the team to the examination phase. Roles serve as guidance, enabling members to make more efficient use of each other's personal store of problem-relevant information. Perceptual distance regarding the degree of team decision-making autonomy thwarts this catalytic process. In essence, this type of perceptual distance represents confusion about who is supposed to do what and who is responsible for decision making.

Decisions can be managed by an autocratic leader or by an autonomous workgroup, or authority can fall somewhere on the continuum between these two extremes. Autonomous workgroups are those that have "a high degree of self-determination . . . in the management of their day-to-day work" (Wall, Kemp, Jackson, & Clegg, 1986; p. 280) and can be responsible for decisions that involve, for example, the distribution of tasks, the pace of work, recruitment, and training (Gulowsen, 1972). This work form is in contrast to traditional forms of leadership, in which a leader makes all of the operational decisions for a team and relies on top-down influence to implement those decisions. Research comparing traditional versus autonomous work designs finds employees in autonomous workgroups generally have higher intrinsic job satisfaction and other favorable work attitudes but are also more likely to be absent (Cordery, Mueller, & Smith, 1991; Wall et al., 1986).

When team autonomy is increased, however, another unintended consequence is that the role of the external leader can become unclear, because this work form requires a shift in decision-making

responsibility from the leader to the team. In contrast to traditional models of leadership, a leader of an autonomous workgroup is responsible for supporting the team but allowing members to make their own decisions (Manz & Sims, 1987). This ambiguity of responsibility can present a challenge, and leaders in such situations often "complain of confusion in their role in terms of what decisions they should and should not make" (Manz & Sims, 1987; p. 122). Further, many teams function as semi-autonomous units (i.e., the team is responsible for some decisions and the leader for others), and leader–team roles may be even more intertwined in these situations.

Optimally, the leader and team clearly understand their decision-making roles and responsibilities. If not, certain decisions may be inadvertently ignored, resulting in inaction on the part of the team, or both parties may "weigh in" where only one party (i.e., the leader or the team) has authority, resulting in confusion and a hindering of the cognitive processes and subsequent performance. Agreement about the locus of decision making can aid in negotiating, interpreting, and evaluating information, thereby moving the team through the cycle of collective cognition and improving team performance. Stated differently, if perceptions regarding decision-making autonomy are not aligned, this should be detrimental to performance. Additionally, since research indicates that team autonomy can be beneficial to performance (Kirkman & Rosen, 1999), team performance should be highest when perceptions are aligned and decision-making autonomy is considered to be high rather than low.

In contrast to our arguments regarding goal accomplishment and constructive conflict, we argue that if the leader perceives the team has more decision-making autonomy than the team believes they do, the resulting dynamics may be more detrimental to team performance than if the team perceives it has more autonomy. If the team perceives greater autonomy and encroaches on the leader's area of perceived authority, some misunderstanding may arise initially, distracting the team from performance efforts, but at least decisions are still being actively addressed and corrections to roles and responsibilities will likely be made by the leader. Conversely, if the team is not aware of its responsibilities (i.e., believing it has less autonomy), this may result in inaction on the part of the team, which should pose a greater hindrance to team performance. If the leader assumes the team is responsible for most key decisions, he or she may feel little need to provide clarification and monitoring, constructive suggestions, and role modeling, even though such behaviors are needed (Larson & Callahan, 1990). The team, however, may need and desire such intervention, particularly if they do not feel ready to accept decision-making authority (Kirkman & Shapiro, 2001). The following hypotheses reflect these ideas:

Hypothesis 3a: The more aligned a leader's and a team's perceptions about decision-making autonomy are (i.e., lower levels of perceptual distance), the better a team will perform.

Hypothesis 3b: Team performance will be highest when the leader's and the team's perceptions of decision-making autonomy are aligned and high rather than aligned and low (i.e., perceptual distance is low and perceptions of decision-making autonomy are high rather than low).

Hypothesis 3c: Team performance will be lower when the leader's perceptions of decision-making autonomy are greater than the team's perceptions rather than when the team's perceptions are greater than the leader's perceptions (i.e., if perceptual distance exists, the magnitude of the effect will be greater if the leader rates decision-making autonomy higher than does the team).

Having developed hypotheses about the nature of relationships between perceptual distance and team performance, we turn now to an empirical investigation of these hypotheses in ongoing work teams across organizations and geographic locations.

Method

Sample and Procedure

Five companies from the pharmaceutical and medical products industry served as research sites for this study. Each company had teams operating across a number of functional areas—including human resources, sales, marketing, manufacturing, and research—and had facilities in at least four geographic areas (the United States, Latin America, Southeast Asia, and western Europe). Human resource professionals in each organization were asked to randomly select teams for interviews and surveys across a variety of team types, ranging from work teams working on manufacturing lines to produce and package pharmaceuticals, to project teams creating training programs for medical products, to management teams responsible for managing distribution or human resources.

A combination of interviews and adaptations of preexisting scales were used to derive the measures utilized in this study. A comprehensive yearlong program of multinational piloting and modification ensured the cross-cultural equivalence, validity, and reliability of the measures as detailed in Gibson, Zellmer-Bruhn, and Schwab (2003). This process first involved interviews with a total of 107 individuals representing 52 teams across all organizations and geographic areas. Between one and five individuals from each team, at a total of 20 sites, were interviewed. Interviews included a series of questions pertaining to team effectiveness and team processes in the native language of the interviewees, with the assistance of a team of bilingual interviewers. Items were then developed, and a team of 15 translators used an extensive translation/back-translation procedure to foster cultural equivalence among the items. A number of items in the survey were altered in response. For example, respondents in the Philippines and Puerto Rico reported discomfort and confusion with an agree–disagree response format. They explained that a scale ranging from 1 (*not accurate*) to 7 (*very accurate*) would be more clear and therefore consistently responded to, given their cultural reluctance to explicitly disagree with formal statements on a survey. Next, the survey was piloted extensively, including in a bilingual pilot study with 11 teams to further examine the validity of the items across the different translated versions. Bilingual respondents filled out the survey in two different languages at different points in time, and a comparison of their responses on the two versions led to a small number of alterations. Finally, a multiple constituency test was conducted with leaders, members, and customers to examine the reliability of the scales at the team level of analysis across different groups of respondents. Some items were discarded, and others were subjected to the translation/back-translation procedure.

To test the hypotheses, we administered the final set of survey scales onsite in each location to a second independent sample of

104 randomly selected teams across the five companies (for an average of 21 teams per company). All members of the teams were invited to participate (a total of 1,154 members, with an average team size of 11 members). To ensure that members focused on the appropriate team, they reported as a team at a preset time and location to fill out the survey. They completed the survey in private and were assured confidentiality (i.e., that other members, leaders, and customers would not see their responses). The final sample consisted of survey data obtained from 813 members of 104 teams (an average of 8 members responding per team), for a response rate of 70 percent. Post hoc interviews with team leaders indicated that nonrespondents were unable to attend the survey administration due to scheduling conflicts, illness, or vacation. The average age of respondents was 39 years, 26% were women, and average tenure on the team was 3.4 years. Team members were colocated and had daily face-to-face contact. Team leaders were senior managers external to the team to whom the team reported (i.e., upper-level managers one hierarchical level above the team in the reporting structure). The leaders were not members of the team; however, our interviews verified that they had extensive interaction with the team on a daily basis. Leaders were often responsible for entire units (which were comprised of numerous teams), but only one team per leader participated in this study, and each leader rated only that one team. In addition, two to three customers (i.e., key stakeholders who received the work of the team and had intimate knowledge of the team's effectiveness) were randomly selected to rate each team in consultation with the team leader and human resource department. Guidelines were to randomly choose customers who had high familiarity with the team. Examples of customers include a product sales representative who receives shipments of pharmaceutical products from a manufacturing team, a physician in a medical office who receives products from a sales team, and members of a training program who receive the training prepared by a project team in a medical products company.

Measures

Leader–team perceptions regarding goal accomplishment. Leaders and team members were asked to rate team goal accomplishment using a five-item scale consisting of the following items: (1) "This team fulfills its mission," (2) "This team accomplishes its objectives," (3) "This team meets the requirements set for it," (4) "This team achieves its goals," and (5) "This team serves the purpose it is intended to serve," using a 7-point Likert scale ranging from 1 (*very inaccurate*) to 7 (*very accurate*). Exploratory factor analysis (maximum likelihood estimation) demonstrated that all items loaded on one factor with eigenvalue 4.01 accounting for 81% of the total variance; loadings ranged from .86 to .92; alpha = .94. We averaged each person's responses across items to arrive at a scale score for each person. To arrive at a team score, we averaged across team members (see justification for aggregation below).

Leader–team perceptions regarding constructive conflict. We asked team members and leaders to rate the degree to which the team engages in constructive conflict effectively with a four-item scale that consisted of the following: (1) "This team resolves conflict well," (2) "There is constructive conflict on this team," (3) "There is cooperative thinking in this team during conflict," and (4) "There is hostility on this team" (reverse coded), using a 7-point Likert scale ranging from 1 (*very inaccurate*) to 7 (*very accurate*). Exploratory factor analysis (maximum likelihood estimation) demonstrated that all items loaded on one factor with eigenvalue 2.34 accounting for 75% of the total variance; loadings ranged from .84 to .88; alpha = .87. Again, we averaged team member ratings of conflict across the four items and then across raters to arrive at a single score for each team (justification below).

Leader–team perceptions regarding decision-making autonomy. We asked team members and leaders to rate the degree to which the team has decision-making autonomy using an adaptation of prior scales (Cordery et al., 1991; Wall et al., 1986). Respondents indicated the extent to which the team had input into the following decisions—(1) "Decisions concerning task assignments in the team," (2) "Planning and scheduling of work," (3) "Decisions concerning leadership inside the team," and (4) "Performance evaluations"—using a 7-point Likert scale ranging from 1 (*no input*) to 7 (*complete input—team makes the decision*). Exploratory factor analysis (maximum likelihood estimation) demonstrated that all items loaded on one factor with eigenvalue 2.86 accounting for 72% of the total variance; loadings ranged from .82 to .97; alpha = .87. As with the scales above, we averaged team member ratings of decision-making autonomy across the four items and then across raters to arrive at a single score for each team (justification below).

Team performance. Our measure of performance captured the overall sense of how effective the team was rather than whether specific goals had been achieved and thus was conceptually distinct from our measure of goal accomplishment; these two measures were also empirically distinct (see *Discriminant Validity* section below). The team's external leader, team members, and team customers were all asked to rate team performance using a four-item scale consisting of the following items—(1) "This team is consistently a high performing team," (2) "This team is effective," (3) "This team makes few mistakes," and (4) "This team does high quality work"—using a 7-point Likert scale ranging from 1 (*very inaccurate*) to 7 (*very accurate*). Exploratory factor analysis (maximum likelihood estimation) demonstrated that all items loaded on one factor with eigenvalue 2.87 accounting for 72% of the total variance; loadings ranged from .80 to .90; alpha = .86. For each team, the average rating across all four items and then across all raters was computed (aggregation justification below).

Aggregation

Team performance, goal accomplishment, constructive conflict, and decision-making autonomy represent team characteristics, but in constructing team perceptions of these variables, we utilized individuals as raters of those characteristics. In the parlance of multilevel theory (Klein & Kozlowski, 2000; p. 41), these are "shared unit-level constructs," meaning that we gathered data from individuals to assess team-level characteristics capable of being differentiated across teams. It is critical with such aggregated variables that we statistically demonstrate within-team agreement and between-team differences (Klein & Kozlowski, 2000). We conducted several analyses to ensure this was the case for the variables aggregated to the team level. First, we calculated an interrater agreement score (r_{WG}) for each variable. This measure ranges from 0 (*no agreement*) to 1 (*complete agreement;* James, Demaree, & Wolf, 1993). Others have suggested .60 as an accept-

able cutoff criterion (Glick, 1985). Average interrater agreement was .93 for team performance, .95 for goal accomplishment, .84 for constructive conflict, and .90 for decision-making autonomy. Next, intraclass correlation coefficients—ICC(1) and ICC(2)—were generated using one-way analysis of variance (ANOVA) on the individual-level data with team as the independent variable and the scales scores as the dependent variables. Both ICCs compare variability existing among and within a sample of teams; ICC(1) is the reliability of individual ratings, and ICC(2) is the reliability of the teams' mean ratings (Bliese, 2000; Klein & Kozlowski, 2000). Positive values of ICC(1) (Bliese, 2000) and a corresponding ANOVA F value that is statistically significant are conditions for scores being aggregated to the team level (Edmondson, 1999; Kenny & LaVoie, 1985). In all cases, the ICC(1) was greater than zero and the F value was significant. Specifically, for team performance, ICC(1) = .08, $F = 2.43$, $p < .001$; goal accomplishment, ICC(1) = .12, $F = 3.50$, $p < .001$; for constructive conflict, ICC(1) = .07, $F = 2.55$, $p < .001$; and for decision-making autonomy, ICC(1) = .05, $F = 2.37$, $p < .001$. ICC(2) values also supported the use of team means, as they were .60 for team performance, .71 for goal accomplishment, .61 for constructive conflict, and .60 for decision-making autonomy. Taken as a whole, these aggregation statistics indicate the aggregation is justified (James, 1982).

Discriminant Validity

Finally, discriminant validity of our measures (Venkatraman & Grant, 1986) was established through a team-level confirmatory factor analysis using LISREL 8 (Joreskog & Sorbom, 1996) to verify the distinctiveness of the constructs in our hypotheses—team performance, goal accomplishment, constructive conflict, and decision-making autonomy—using all items from all of the scales. We compared the proposed four-factor measurement model with an alternative two-factor model: team performance and team characteristics (combining goal accomplishment, constructive conflict, and decision-making autonomy) and an omnibus one-factor model. Absolute fit indexes for the proposed four-factor model ranged from adequate to excellent, $\chi^2(98, N = 104) = 201.88$, $p < .001$, goodness of fit index (GFI) = .91, comparative fit index (CFI) = .94, incremental fit index (IFI) = .94, root-mean-square error of approximation (RMSEA) = .07, and these fit indexes were superior to the two-factor model, $\chi^2(103, N = 104) = 630.95$, $p < .001$, GFI = .54, CFI = .71, IFI = .71, RMSEA = .22, $\Delta\chi^2(5, N = 104) = 429.07$, $p < .001$, and the one-factor model, $\chi^2(104, N = 104) = 813.05$, $p < .001$, GFI = .49, CFI = .61, IFI = .62, RMSEA = .26, $\Delta\chi^2(6, N = 104) = 611.17$, $p < .001$. The expected cross-validation index (ECVI; Browne & Cudeck, 1993), which is an approximate measure of the GFI that the present model would attain in an additional sample of the same size, was better (i.e., smaller) for our four-factor model than for the two-factor and one-factor models ($ECVI_{4\text{-factor}} = 2.672$, $ECVI_{2\text{-factor}} = 6.701$, $ECVI_{1\text{-factor}} = 8.433$). In addition, the value of another comparative index, Akaike's information criterion (AIC; Boomsma, 2000; Hu & Bentler, 1999) was better (i.e., smaller) for our four-factor model as well ($AIC_{4\text{-factor}} = 277.88$, $AIC_{2\text{-factor}} = 696.95$, $AIC_{1\text{-factor}} = 877.05$). In order to compare fit indexes across models, we used the standards recommended by Scullen, Mount, and Judge (2003). All of these results indicate that our four-factor model provided a better fit to the data than did the plausible rival specifications. Hence, the four scales represent concepts that are both theoretically and empirically distinguishable.

Controls

Several control variables were included in the analyses. First, we controlled for within-team perceptual distance regarding each characteristic (operationalized as the within-team standard deviation of member ratings of characteristic), in order to isolate the specific effects of leader–team differences from within-team differences. We also included dummy variables to control for company, country, and team type, anticipating that these factors may be related to performance, given that team performance has been known to vary across firm, national, and task contexts (see Earley & Gibson, 2002, for a review).

Analysis and Results

The means, standard deviations, and intercorrelations of the variables appear in Table 1. The intercorrelations indicate that the

Table 1
Means, Standard Deviations, and Correlations Among Variables

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12
1. Team rated team performance	5.46	0.61	—											
2. Customer rated team performance	5.26	0.89	.27	—										
3. Leader rated team performance	5.40	0.95	.47	.43	—									
4. Average team performance rating	5.40	0.66	.72	.77	.88	—								
5. Team rated goal accomplishment	5.71	0.69	.67	.11	.35	.50	—							
6. Leader rated goal accomplishment	5.70	0.96	.41	.38	.59	.57	.27	—						
7. Within-team perceptual distance on goals	0.61	0.45	–.41	–.05	–.15	–.26	–.62	–.11	—					
8. Team rated constructive conflict	5.27	0.76	.38	.01	–.01	.15	.39	.03	–.16	—				
9. Leader rated constructive conflict	5.23	0.99	.27	.36	.33	.37	.16	.42	–.09	.39	—			
10. Within-team perceptual distance on conflict	0.85	0.44	–.09	.20	.16	.09	–.08	.15	.14	–.28	.01	—		
11. Team rated decision-making autonomy	4.72	0.82	.38	–.01	.10	.24	.52	.15	–.38	.36	.17	–.25	—	
12. Leader rated decision-making autonomy	4.90	0.97	–.08	.25	.10	.13	–.09	.12	.08	–.05	.25	.17	.28	—
13. Within-team perceptual distance on decision making	0.91	0.59	–.22	–.01	–.12	–.17	–.26	.07	.29	–.14	–.07	.30	–.37	.13

Note. $N = 65$. Correlations with absolute value greater than .20 are significant at the .05 level.

various perceptions are empirically distinct. That is, we do not see consistently high positive correlations among all of the perceptual variables. For example, leader-rated goal accomplishment is not significantly correlated with leader-rated decision-making autonomy ($r = .12$, *ns*).

To test the functional form of the perceptual distance–performance relationships, we employed polynomial regression analysis (Edwards & Parry, 1993). Separate hierarchical ordinary least squares regressions were computed for each target of perception (goal accomplishment, constructive conflict, decision-making autonomy) whereby performance was regressed on teams' ratings, leaders' ratings, and the controls' ratings (within-team perceptual distance, firm, country, and team type) in Step 1, and the cross-product of teams' ratings and leaders' ratings, the square of teams' ratings, and the square of leaders' ratings were added in Step 2. A significant increase in R^2 in Step 2 indicates a nonlinear relationship between leaders' and teams' ratings and performance (Atwater et al., 1998; Edwards, 2002). Measures were included in the models in scale-centered form, that is, centered at their scale midpoints. Doing so reduces multicollinearity, allows meaningful interpretation of coefficients on first-order terms, and facilitates the interpretation of the coefficients on the *xy*-plane, where the origin of the *x*- and *y*-axes is located (Edwards, 1994).

For goal accomplishment and constructive conflict, the pattern revealed in the regressions was similar. For goal accomplishment, adding the higher order terms in Step 2 resulted in a significant increase in R^2 ($\Delta R^2 = .02$, $\Delta F = 2.29$, $p < .05$) and the overall R^2 of .71 was significant, $F(16, 88) = 13.42$, $p < .001$, providing initial evidence for the relationships predicted in Hypotheses 1a–1c (see Table 2). Likewise, for constructive conflict, adding the higher order terms in Step 2 resulted in a significant increase in R^2 ($\Delta R^2 = .03$, $\Delta F = 2.17$, $p < .05$), and the overall R^2 of .62 was significant, $F(16, 88) = 8.74$, $p < .001$, providing initial evidence for the relationships predicted in Hypotheses 2a–2c (see Table 3). In contrast, for decision-making autonomy, adding the higher order terms in Step 2 failed to result in a significant change in R^2, providing no support for the effects proposed in Hypotheses 3a–3c (see Table 4). The direct linear effect of both teams' perceptions and leaders' perceptions on decision making was positive and significant; performance was highest when both leaders' and teams' ratings of decision-making autonomy were high.

To confirm whether goal accomplishment and constructive conflict related to performance as predicted in Hypotheses 1a–1c and Hypotheses 2a–2c, we had to graph these results and analyze the shape of the surface associated with each set of variables. Given that the higher order equations for goal accomplishment and constructive conflict were significant, they could be graphed in a three-dimensional plane (Edwards, 1993, 1994; see Figures 1 and 2). According to Edwards and his colleagues (Edwards & Harrison, 1993; Edwards & Parry, 1993), salient features of the surface can then be identified by locating the stationary point of the graph and the principal axes, which are used to calculate and describe the slopes of the surface (Edwards, 2002). The slopes of the surface will ultimately confirm (or not) the hypothesized effects.

For goal accomplishment, the stationary point was located at $x = -1.16$, $y = -2.76$. The first principal axis (the line of minimum downward curvature) had an intercept of −0.586 and a slope of 1.874. The second principal axis (the line of maximum downward curvature) had an intercept of –3.379 and a slope of −0.534. The principal axes run perpendicular to one another and intersect at the stationary point. To calculate the slopes of the surface, first we let $a_1 = b_1 + b_2$ and $a_2 = b_3 + b_4 + b_5$, where b_1 is the beta for a team's ratings, b_2 is the beta for the leader's ratings, b_3 is the beta for the team's ratings squared, b_4 is the beta for the cross-product of the team's and the leader's ratings, and b_5 is the beta for the leader's ratings squared. If a_1 differs significantly from zero but a_2 does not, then there is a linear slope along the line of perfect agreement when the team's ratings equal the leader's ratings ($x = y$). In our case, for goal accomplishment, there was a linear positive slope ($a_1 = 0.505$, $p < .01$; $a_2 = 0.006$, *ns*) along the $x = y$ line. Performance was higher as both the leader's and the team's ratings became higher, and performance became lower as both the leader's and the team's ratings became lower.

To gain additional information regarding goal accomplishment, we also tested the slope along the reverse of the $x = y$ line, the $y = -x$ line. Here, we let $x_1 = b_1 - b_2$ and $x_2 = b_3 - b_4 + b_5$. As with the interpretations along the $x = y$ line, if x_1 differs from zero but x_2 does not, then there is a linear slope along the $y = -x$ line. Our data reflect the opposite: x_1 does not differ from zero, but x_2 does. Further, since x_2 is negative, this indicates the surface for goal accomplishment is curved downward (i.e., concave) along the $y = -x$ line ($x_1 = 0.247$, $p < .10$; $x_2 = -0.892$, $p < .001$). Taken together, this information implies the overall shape of the surface for perceptual distance regarding goal accomplishment is curvilinear but not completely dome-

Table 2
Ordinary Least Squares Regression Results for Perceptual Distance Regarding Goal Accomplishment

Variable	Average team performance	
	Step 1	Step 2
Predictors		
Team's ratings of goal accomplishment	0.27**	0.376
Leader's ratings of goal accomplishment	0.37***	0.129
Team's ratings of goal accomplishment squared		−0.372*
Leader's × Team's Ratings of Goal Accomplishment		0.449
Leader's ratings of goal accomplishment squared		−0.071
Controls		
Within-team perceptual distance regarding goal accomplishment	−0.01	−0.02
Company 1	0.06	0.04
Company 2	0.04	0.00
Company 3	−0.13	−0.15
Company 4	−0.19	−0.12
Country 1	0.45***	0.46***
Country 2	0.25**	0.26**
Country 3	0.75***	0.67***
Project team	−0.04	−0.05
Parallel team	−0.06	−0.05
Management team	0.01	−0.01
R^2	.69[a] ***	.71[b] ***
Adjusted R^2	.64	.66
ΔR^2	.02 ($\Delta F = 2.29$, $p < .05$)	

[a] $F(13, 91) = 15.34$. [b] $F(16, 88) = 13.42$.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 3
Ordinary Least Squares Regression Results for Perceptual Distance Regarding Constructive Conflict

Variable	Average team performance Step 1	Step 2
Predictors		
Team's ratings of constructive conflict	0.02	0.101
Leader's ratings of constructive conflict	0.27***	0.654***
Team's ratings of constructive conflict squared		0.071
Leader's × Team's Ratings of Constructive Conflict		−0.315
Leader's ratings of constructive conflict squared		−0.223
Controls		
Within-team perceptual distance regarding constructive conflict	−0.03	−0.04
Company 1	0.06	0.05
Company 2	−0.07	−0.07
Company 3	−0.19*	−0.21*
Company 4	−0.52***	−0.53***
Country 1	0.63***	0.62***
Country 2	0.34***	0.34***
Country 3	1.05***	1.09***
Project team	−0.05	−0.04
Parallel team	−0.10	−0.10
Management team	−0.02	−0.02
R^2	.59[a] ***	.62[b] ***
Adjusted R^2	.52	.54
ΔR^2	.03 ($\Delta F = 2.17$, $p < .05$)	

[a] $F(13, 91) = 9.95$. [b] $F(16, 88) = 8.74$.
* $p < .05$. *** $p < .001$.

shaped (i.e., concave). Although the surface is dome-shaped along the graph where $y = -x$, the relationship between the variables is positive linear along $x = y$. This implies performance is better when there is agreement rather than disagreement in team and leader ratings of goal accomplishment, confirming Hypothesis 1a. Stated differently, for any given goal accomplishment level, performance decreases as leader–team perceptual distance increases. Additionally, as indicated by the positive slope of the $x = y$ line, performance is highest when ratings are aligned and high, indicating support for Hypothesis 1b.

Finally, it is possible to examine some trends in the surface, considering lateral shifts in the surface along the $x = y$ line. The magnitude and direction of this shift is determined by the quantity $(b_2 - b_1)/2(b_3 - b_4 + b_5)$ (Atwater et al., 1998). A positive value indicates a shift toward the region where $x > y$, and a negative value indicates a shift toward the region where $x < y$. The magnitude of the rotation is also determined by b_4, with larger rotations for smaller values of b_4. For goal accomplishment, the lateral shift calculation resulted in a positive value, $(b_2 - b_1)/2(b_3 - b_4 + b_5) = .138$, indicating a shift toward the region where $x > y$. Thus, when the team's ratings (x) are higher than the leader's (y), performance decreases more sharply than for the reverse, supporting Hypothesis 1c. However, the magnitude of this shift was relatively small.

The response surface for constructive conflict was shaped somewhat differently from that for goal accomplishment. The stationary point was located at $x = 0.9902$, $y = 0.7670$. The first principal axis (the line of maximum upward curvature) had an intercept of 1.197 and a slope of −0.435. The second principal axis (the line of maximum downward curvature) had an intercept of –1.512 and a slope of 2.301. Along the $x = y$ line, a significant value for a_1 and a significant, negative value for a_2 indicates a significant linear slope downward (i.e., the surface is concave or dome-shaped; $a_1 = 0.755$, $p < .001$; $a_2 = -0.467$, $p < .001$). The downward slope on the $x = y$ line implies performance is higher when the leader's and the team's ratings are similar to one another than when they differ, providing support for Hypothesis 2a.

Along the $y = -x$ line, the fact that x_1 differs from zero but x_2 does not seems to at first glance imply that the relationship was linear and negative ($x_1 = -0.553$, $p < .001$; $x_2 = 0.163$, $p < .10$; i.e., such that when the leader and team agree, the greater the constructive conflict, the worse the performance). Superficially, this result would appear to contradict Hypothesis 2b, which predicted a positive relationship between constructive conflict and team performance. However, a much closer and careful analysis of Figure 2 and results from Step 2 in the regression equation (see Table 3) indeed implies the predicted positive relationship between constructive conflict and performance proposed in Hypothesis 2b but with diminishing returns. That is, when $x = y$, constructive conflict is positively related to team performance until ratings by both the team and the leader reach the highest level (e.g., $x = 2$,

Table 4
Ordinary Least Squares Regression Results for Perceptual Distance Regarding Decision-Making Autonomy

Variable	Average team performance Step 1	Step 2
Predictors		
Team's ratings of decision-making autonomy	0.24**	0.292*
Leader's ratings of decision-making autonomy	0.16*	0.137
Team's ratings of decision-making autonomy squared		−0.066
Leader's × Team's Ratings of Decision-Making Autonomy		−0.043
Leader's ratings of decision-making autonomy squared		0.099
Controls		
Within-team perceptual distance regarding decision-making autonomy	−0.01	−0.03
Company 1	0.04	0.03
Company 2	−0.09	−0.10
Company 3	−0.26**	−0.26**
Company 4	−0.66***	−0.68***
Country 1	0.56***	0.56***
Country 2	0.49***	0.50***
Country 3	1.21***	1.21***
Project team	−0.05	−0.06
Parallel team	−0.15	−0.15
Management team	0.01	0.01
R^2	.59[a] ***	.60[b] ***
Adjusted R^2	.53	.53
ΔR^2	.00 ($\Delta F = .61$, *ns*)	

[a] $F(13, 91) = 9.98$. [b] $F(16, 88) = 8.12$.
* $p < .05$. ** $p < .01$. *** $p < .001$.

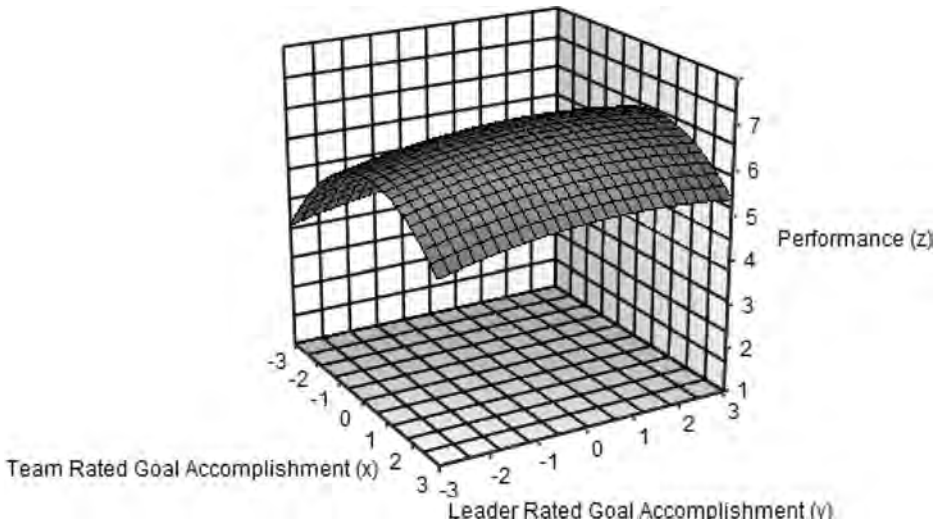

Figure 1. Leader–team perceptual distance regarding goal accomplishment.

$y = 2$, and $x = 3$, $y = 3$). It is only at this point that greater amounts of constructive conflict lead to lower performance. Thus, although x_2 did not reach the necessary level of significance to support a curvilinear effect, some nonlinearity appears on the graph and in the data points analyzed, supporting Hypothesis 2b. This information implies that the overall shape of the surface for perceptual distance regarding constructive conflict is curvilinear but not completely dome-shaped. Although the surface is dome-shaped along the graph where $x = y$, the relationship between the variables (statistically) is linear along $y = -x$.

In terms of shifts, the lateral shift calculated had a positive value, $b_2 - b_1/2(b_3 - b_4 + b_5) = 1.70$, implying a shift toward the region where $x > y$, and the magnitude of the shift was fairly modest. Thus, when a team's ratings (x) were greater than the leader's ratings (y), performance decreased more sharply than for the reverse, confirming Hypothesis 2c.

Discussion

This research demonstrates that leader–team perceptual distance is an important consideration in work teams. In our sample, leader–team perceptual distance had a greater predictive capacity than did within-team perceptual distance: Leader–team perceptual distance demonstrated significant effects for goal accomplishment and constructive conflict, whereas within-team perceptual distance among members failed to demonstrate significant effects for any of the three phenomena. Although the incremental variance explained by leader–team perceptual distance is relatively small, these results support our contention that perceptual differences between a leader and a team should not simply be disregarded as error but can, in and of themselves, have effects on the functioning of teams.

Our findings also indicate that for both goal accomplishment and constructive conflict, performance is higher when leader–team per-

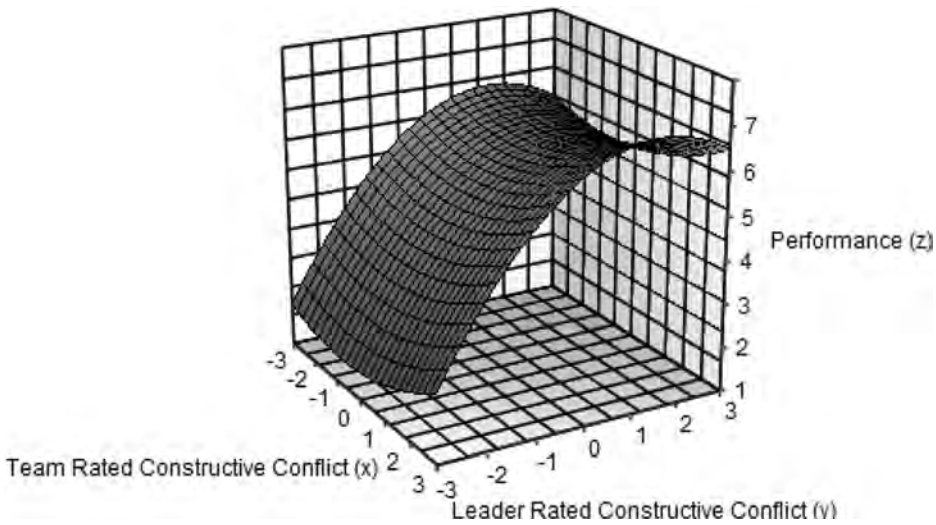

Figure 2. Leader–team perceptual distance regarding conflict.

ceptual distance is low. However, if perceptual distance exists on these dimensions, there is more of a performance advantage when the leader's perceptions are slightly higher than the team's perceptions than vice-versa. Further, for goal accomplishment, performance is higher overall when the leader's and the team's perceptions are high rather than low. Interestingly, for constructive conflict, at first glance some of the calculations imply that higher levels of constructive conflict are negatively related to performance. However, a closer look at Figure 2 and examination of specific data points reveals that there is a positive relationship between constructive conflict and team performance up until the highest levels of constructive conflict are reached. It is only at this point that we see the negative relationship. Hence, constructive conflict is beneficial but with diminishing returns. The relationship between the leader's ratings and the team's ratings of decision-making autonomy and performance are not curvilinear, but the additive congruence effect implied by the two significant positive betas indicates that performance is highest when both parties rate decision-making autonomy high and becomes progressively lower as ratings become more incongruent.

Implications for Theory and Research

This research contributes to the organizational literature in the areas of leadership, collective cognition, and team effectiveness and constitutes a unique application of polynomial regression and response surface methodology to examine perceptions in teams. First, our study contributes to the leadership literature by expanding our knowledge of the role that perceptions play for teams and by introducing a construct that captures differences in leader–team perceptions. This complements previous research on leadership in which there is a long history of work examining subordinates' perceptions of leaders' behavior. We add a new concept to the field that is distinct from the construct of dyadic congruence in the leader–member exchange literature (Wexley et al., 1980) and from the concept of social distance (Shamir, 1995). Moreover, this study bridges a gap in leadership research, since "previous leadership theories have tended to focus on how leaders influence collections of subordinates, without attending to how leadership fosters the integration of subordinate actions (i.e., how leaders promote team processes)" (Zaccaro et al., 2001; p. 452).

A second domain to which we contribute is collective cognition. Although theoretical advancements are comprehensive and rich in this arena (e.g., Hinsz et al., 1997), empirical evidence collected from actual teams in organizations is rare. We provide empirical evidence of the relationship between perceptual phenomena and team performance, as well as a logic explaining the cognitive mechanisms underlying these relationships. This logic makes use of prior theoretical frameworks to delineate how process dynamics are likely to play out between leaders and teams, contributing knowledge to this complex area of study. Future research, however, needs to explore how and why perceptual differences arise between leaders and teams and how they might be minimized to produce desirable outcomes. While perceptual differences may be the product of variations in experience or skills, they may also be setting-dependent. For example, are there certain work settings or goals that are more prone to produce perceptual differences between leaders and teams? Do situations that involve greater shared leadership (Pearce & Conger, 2003) tend to minimize perceptual differences? Do geographically dispersed teams (Gibson & Gibbs, 2006) tend to demonstrate greater differences? Does task or goal complexity increase the probability of perceptual differences? Do longevity and the life stage of the team influence perceptual differences? In other words, when leaders and teams have worked together over long periods of time, are they more likely to have similar perceptions? Do leaders and teams in high power distance cultures tend to have greater perceptual distance? Does perceptual distance act through its effects on collective cognition? These issues all deserve further investigation.

A third domain to which we contribute is research examining team effectiveness—specifically, the stream of research examining sources of heterogeneity in teams and their impact on team performance. We identify a new "input" that appears to have robust effects: perceptual differences between a team and its leader. Granted, we studied perceptions around only three phenomena, but leader–team perceptions of many other factors—such as conceptions of the meaning of teamwork (Gibson & Zellmer-Bruhn, 2001), deadlines (Waller, Conte, Gibson, & Carpenter, 2001), member competencies, or external networks of relationships—may also be important. There may also be dimensions where perceptual distance in teams produces no effect (e.g., interpersonal dimensions such as certain personality characteristics that do not directly influence team outcomes). Future research should therefore focus on identifying phenomena for which perceptual distance is beneficial or, alternatively, of no consequence. Within-team perceptual differences did not demonstrate effects in this study but may be important for other kinds of outcomes, such as satisfaction of members, group identification, group potency, innovation, and creativity.

Finally, it is noteworthy that, as suggested by Edwards (Edwards, 2007; Edwards & Parry, 1993), the use of quadratic polynomial regressions and response surface methodology provided important insights not elucidated with squared difference terms and two-dimensional graphic representations. For example, given no support was obtained for the hypothesis regarding perceptions of decision-making autonomy, we further explored potential relationships with a constrained equation (Edwards & Parry, 1993). That is, we entered a squared difference score (i.e., the square of the difference between a leader's and a team's perceptions of decision making) in a traditional hierarchical regression. This resulted in a significant change in R^2, suggesting a curvilinear relationship. Further, a two-dimensional graphic representation of the relationship between the squared difference for decision-making autonomy and performance indicated the expected inverted-U shape form (i.e., performance was highest when perceptions were aligned). Therefore, it is easy to see how one could misinterpret these data as demonstrating a two-dimensional curvilinear pattern. However, coefficients from the unconstrained equation (Step 2 in Table 4) did not correspond to the pattern predicted by the squared difference, which is as follows: (a) nonsignificant coefficients on x and y; (b) positive coefficients of equal magnitude on x^2 and y^2; and (c) coefficients on x^2, xy, and y^2 that sum to zero. Hence, even though it was statistically significant, the squared difference term (with its associated constraints) was not an adequate representation of the data (Edwards & Parry, 1993). The results of the polynomial regression results reported above, which are free of the problems imposed by squared difference terms (Edwards, 2007), clearly show a linear pattern for decision making, indicating the importance of using polynomial regression to examine differences in perception.

The examination of shifts away from perfect agreement between leaders and their teams by means of response surface methodology also revealed other important nuances that could not be observed with two-dimensional representations. Specifically, relationships with performance were not entirely symmetrical when comparing cases in which leaders' perceptions exceeded teams' perceptions versus cases in which teams' perceptions exceeded leaders' perceptions. That is, for goals, when leaders had slightly higher perceptions of goal accomplishment, this resulted in a slight performance advantage, whereas when teams had slightly higher perceptions of goal accomplishment, this resulted in a slight performance disadvantage. As we had argued, if the team perceives greater goal accomplishment than does the leader, the team will likely consider its knowledge accumulation sufficient, while the leader may see the need for more knowledge about task requirements and, hence, provide constructive criticism that threatens the team's sense of efficacy.

Similarly, for conflict, a performance advantage occurred when the leader had slightly higher perceptions of constructive conflict than did the team, and a disadvantage occurred when the team had higher perceptions than did the leader. As we reasoned, this suggests that if a team perceives that it is engaging in constructive conflict, whereas the leader is not comfortable with how disagreements are being handled, the leader may be inclined to intervene where he or she is not needed, to the confusion and/or annoyance of team members. Although both of these situations can be avoided if the leader and team come to shared perceptions of goal accomplishment and constructive conflict, this interesting difference was not evident in examining two-dimensional graphic representations of the relationships, as would be commonplace when using a squared difference term to represent perceptual differences.

Limitations of the Study

It is important to acknowledge the limitations of our study. The sample was drawn entirely from two related industries—pharmaceutical and medical products. Industry characteristics could have contributed in part to our findings. For example, the degree to which industries are addressing efficiencies versus adaptation is likely relevant (Selznick, 1957). An emphasis on efficiencies tends to promote environments requiring a high degree of organizational stability, which may create settings in which teams and their leaders have a lower degree of perceptual distance. Future research should look across a wider range of industry settings to see if our findings generalize. Further, our survey methodology had the advantage of allowing data collection from a broad, geographically diverse sample. Yet without direct observation of the teams, we were unable to directly examine the mechanics of how perceptual distance occurred and how it impacted the teams. Although existing research and theory on collective cognition supports a convincing argument, we do not know with certainty that this is the actual mechanism driving the empirical results. A welcome extension of our research involves verifying the mechanisms hypothesized herein. Finally, our study is static; we did not study the teams longitudinally. It is conceivable that perceptual differences vary over the life cycle of the team, and future research should explore this as well. Such studies may also inform the design of interventions to help manage perceptual distance.

Implications for Practice

In team environments, organizations need to introduce and support procedures that ascertain whether the leader's and the team's perceptions of relevant stimuli agree. Leaders and teams may not be able to explicitly focus on every possible aspect of their processes or operations; however, the operating issues that are most relevant could be addressed. Suitable procedures for this facilitation can vary in degree of formality ranging from standardized, scheduled procedures to informal, discretionary ones. Organizations could also encourage a combination of practices. For example, pertaining to perceptual distance regarding goal accomplishment, the leader and team could determine clear, explicit, and measurable criteria around goal accomplishment at the start of projects. Then they could agree on metrics that track the ongoing progress toward goals and mark milestones for discussing progress and providing feedback. Periodic surveys might then be administered to determine if the leader's and the team's perceptions agree. We are aware of at least one large firm that uses 360-degree team feedback at various points in the teams' task. Parties might also supplement this feedback process with informal dialogue sessions between the leader and the team that are at fixed points on the project's schedule. Feedback built around dialogue rather than simply survey instruments has the potential to provide a greater richness of data and offer more profound insights into why perceptual differences exist and how to resolve them.

In conclusion, teams and their leaders need to become more aware of the role of perceptions and their influence on team outcomes. Unfortunately, in the quest to be ever more productive, leaders often become focused largely on task accomplishment. As a byproduct, they fail to reflect on the impact of psychological forces and cognitive processes that may ultimately hinder what they are seeking—an effective team. To overlook such forces, however, means that a team may pay a significant price when it comes to realizing its full potential.

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