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The Power of Percipience: Consequences of Self-Awareness in Teams on Team-Level Functioning and Performance

Erich C. Dierdorff, *DePaul University*

David M Fisher, *University of Tulsa*

Robert S. Rubin, *DePaul University*

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Erich C. Dierdorff

DePaul University

David M. Fisher

The University of Tulsa

Robert S. Rubin

DePaul University

We integrate research on team functioning with that of self-awareness to advance the notion of self-awareness in teams as an important concept to consider when diagnosing team effectiveness. We argue that teams composed of individuals with greater levels of self-awareness will exhibit more effective team-level functioning and performance. This proposition was explored by examining the effects of self-other agreement with regard to individual-level contributions of teamwork behavior on three team-level functional outcomes (team coordination, conflict, cohesion) and team performance. Results from 515 teams (2,658 individuals) completing a high-fidelity team-based business simulation supported the effects of aggregate levels of self-awareness on team-level functioning and performance. Moreover, these effects were influential above and beyond individual contributions themselves, highlighting the unique value of team members' self-awareness for understanding team functioning. Of the three functional outcomes, only team conflict mediated the effects of self-awareness in teams on subsequent team-level performance. Finally, results revealed that overrating among team members was a particularly problematic form of the lack of self-awareness in teams.

Keywords: teams; groups/group processes/dynamics; virtual teams

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Corresponding author: Erich C. Dierdorff, Driehaus College of Business, DePaul University, 1 E. Jackson Blvd, Chicago, IL 60604, USA.

E-mail: edierdor@depaul.edu

As organizations continue to rely on team-based work practices to accomplish complex and critical tasks (Tannenbaum, Mathieu, Salas, & Cohen, 2012), deepening our understanding of the various factors that influence team functioning remains important to organizational success. To do so requires the recognition that teams are ultimately composed of individual members whose unique knowledge, skills, attitudes, beliefs, dispositional tendencies, and behavioral contributions collectively manifest to influence the combined capacity of the team as a whole (Kozlowski, Gully, Nason, & Smith, 1999; Marks, Mathieu, & Zaccaro, 2001). Indeed, research has shown that individual characteristics—when operationalized as compositional features of the team—are related to important team-level outcomes (Barrick, Stewart, Neubert, & Mount, 1998; Bell, 2007; Mathieu, Maynard, Rapp, & Gilson, 2008). An understanding of how individual-level phenomena and team-member characteristics affect team-level outcomes thus allows for valuable insights into understanding team functioning and performance.

A host of team-member characteristics have been examined in relation to team functioning, such as cognitive ability, personality, beliefs, values, and knowledge or expertise (Mathieu, Tannenbaum, Donsbach, & Alliger, 2014). Although this scholarship is rich and expansive, other theoretically important team member characteristics remain to be empirically examined. One such factor is that of self-awareness, which has been generally defined as the capacity “to reflect on and accurately assess one’s own behaviors and skills as they are manifested in workplace interactions” (Church, 1997: 281). The paucity of studies that directly examine self-awareness in the literature on teams is surprising, especially given the widespread recognition that integrated individual-level contributions are essential for team-level functioning (Ellis et al., 2003) and the abundance of studies showing the effects of self-awareness in domains outside of team scholarship (Connelly & Ones, 2010; Dunning, Heath, & Suls, 2004; Fleenor, Smither, Atwater, Braddy, & Sturm, 2010).¹

In the context of work-related performance, the notion of self-awareness has been examined most frequently in scholarship on leadership (Atwater & Yammarino, 1992; Church, 1997; Fleenor et al., 2010; Ostroff, Atwater, & Feinberg, 2004; Yammarino & Atwater, 1997). Here, assessment of one’s own behavior is typically considered in relation to others’ perceptions; thus, self-awareness is most often operationalized as self-other agreement in ratings. Research in this area has found that those who exhibit high levels of self-awareness (high self-other agreement) are more likely to be effective in the workplace as a result of the capacity to correctly diagnose their own capabilities, in turn allowing for appropriate strategies with regard to interpersonal interactions and task completion. Conversely, those low in self-awareness are less effective due to an apparent misdiagnosis of personal competence and contributions.

Given the interdependent nature of teamwork, which necessitates synchronized interaction with others to accomplish team goals (LePine, Piccolo, Jackson, Mathieu, & Saul, 2008), it stands to reason that accurate self-awareness of one’s personal contributions to the team should be relevant to team-level functioning. For example, Fletcher (1997: 186) noted, “If one lacks [self-awareness], then it is difficult to see how one can manage work relationships successfully, how one can contribute well as a team member, and how one can adapt one’s behaviour to the circumstances and individuals.” Although such statements are insightful, the rationale that self-awareness is relevant for teamwork is based on generalization of evidence outside the empirical research on teams. That is to say, just because self-awareness has been

shown to be important to leadership does not mean that we can assume that it is relevant in team contexts without careful consideration and empirical confirmation.

There are several reasons to expect that self-awareness among a team's members will affect team-level functioning and performance. For example, multilevel theory suggests that team performance is ultimately compilational in nature, meaning that it emerges from the interplay of individual team member activity and contributions (Kozlowski & Chao, 2012). When teams exhibit some form of interdependence among members, effective team performance necessitates that any given member's contributions are integrated with the contributions of other members. As a result, while individual-level contributions are indeed important, for those contributions to positively contribute to team-level functioning, they must also be meaningfully aligned and integrated across team members. It is here that we argue that the unique value of self-awareness comes into play. If a person does not have an accurate sense of his or her own contributions (i.e., self-awareness), it will be very difficult to adequately calibrate and align these contributions with the collective, interdependent task demands of the team—regardless of the amount of those contributions. This in turn suggests that self-awareness of individual contributions is important above and beyond actual contributions in team contexts.

In light of this, the purpose of our study was to examine how team members' self-awareness influences team-level functioning. We define self-awareness as self-other agreement with regard to an individual's contributions to the team, spanning individual-level behaviors tied to preparation, execution, monitoring, and adjustment (Marks et al., 2001; Rousseau, Aube, & Savoie, 2006; Salas, Sims, & Burke, 2005; Stevens & Campion, 1994). We propose that aggregate levels of self-awareness among team members reflect an important compositional feature of teams such that teams composed of individuals with higher levels of self-awareness function more effectively than those composed of individuals with lower levels of self-awareness. We specifically considered several team-level functional outcomes known to influence team performance—namely, team coordination, conflict, and cohesion (Beal, Cohen, Burke, & McLendon, 2003; LePine et al., 2008; Mathieu et al., 2008). Finally, congruent with the input-process-outcome (IPO) framework of team effectiveness (McGrath, 1964), we examine these three functional outcomes for their mediational roles in conveying the effects of aggregated self-awareness on team performance. Our study encompassed a sample of 515 teams, including a total of 2,658 individuals, completing a high-fidelity team-based business simulation.

As part of this effort, we extend existing theory and research on self-awareness and team effectiveness in four ways. First, we integrate scholarship on self-perceptions, self-other agreement, and team member cognition to advance the notion of *self-awareness in teams* as a valuable concept to consider when diagnosing team effectiveness. Second, this integration extends research on self-awareness, which has primarily examined individual-level outcomes. Because work organizations are inherently multilevel, scholars have cautioned against assuming that variables of relevance at one level of analysis have comparable effects at other levels (K. J. Klein & Kozlowski, 2000). Third, we draw from the literature on team member cognition, allowing us to embed the concept of self-awareness directly within team contexts. This scholarship has emphasized team member cognitions of emergent team-level content, such as shared mental models (Mohammed, Ferzandi, & Hamilton, 2010). Yet, such cognitions are also recognized as inherently individual (Rentsch & Hall, 1994). We thus add

to prior theory by articulating and testing how cognitions linked to individual-level content influence team effectiveness. Finally, viewing self-awareness as team member cognition also differentiates our focus from studies of teams that have examined similar concepts. For example, “self-awareness” is often discussed as a component of emotional intelligence (Joseph & Newman, 2010), and emotional intelligence has been studied in teams (P. J. Jordan & Ashkanasy, 2006). However, the focus of such research is on emotional self-awareness, which is the ability to perceive and regulate one’s emotions. In contrast, we examine self-awareness in terms of the cognitions (self-schemas) that team members hold about their own contributions to the team.

In the paragraphs that follow, we discuss the accuracy of self-perceptions of performance. This is followed by an articulation of the concept of self-awareness in teams, where we integrate previous work on team member cognitions and schemas as well as build hypotheses regarding the team-level consequences of aggregated self-awareness. Last, we address additional considerations related to viewing self-awareness as a team-level compositional attribute.

(In)Accuracy of Self-Perceptions of Performance

Theory has long purported that people have a strong inclination and motivation to form accurate self-perceptions of their own behavior (Festinger, 1954). Yet, the preponderance of evidence indicates that individuals tend to be relatively poor at accurately evaluating their own performance. As Fleenor et al. (2010: 1005) noted, “individuals do not appear to be good judges of how they are seen or rated by bosses, direct reports, or peers, regardless of whether the ratings are based on skills, leadership behaviors, performance, or personality.” This assertion is corroborated by meta-analyses showing only moderate correspondence between self-ratings and the ratings of others (Conway & Huffcutt, 1997; Harris & Schaubroeck, 1988). For example, Heidemeier and Moser (2009) found a meta-analytic correlation of .22 between self and supervisory performance ratings. More recently, Zell and Krizan (2014) synthesized 22 meta-analyses regarding the correspondence between self-evaluations and performance, finding that although variation exists, people have low to moderate insight (mean $\rho = .29$) into their own performance.

Despite the various reasons that might account for the lack of accuracy with self-appraisals, a compelling explanation is that of an egocentric bias, whereby self-raters tend to have a more positive view of themselves than do others. This perspective is consistent with research documenting the general human propensity for biased information processing and positive self-regard, including studies of self-serving attributions (Mezulis, Abramson, Hyde, & Hankin, 2004), positive illusions (Taylor & Brown, 1988), and self-deception (von Hippel & Trivers, 2011). Accordingly, on average, self-ratings tend to be higher than ratings furnished by others for the same target (Heidemeier & Moser, 2009; Saavedra & Kwun, 1993).²

Notwithstanding the general (or average) tendency for inflated self-ratings, research has documented self-other discrepancies where, in addition to overraters, there are individuals who provide self-ratings similar to or lower than the ratings of others (Fleenor et al., 2010). Such findings are not necessarily inconsistent with an egocentric bias but rather suggest that beyond the average propensity for inflation in self-ratings, there is meaningful variation in this phenomenon. This interpretation is consistent with Mezulis and colleagues’ (2004)

meta-analysis on self-serving bias, which showed that regardless of the pervasive nature of this bias, there is still systematic variation in its expression. When viewed in conjunction with the ratings of others, this variation reflects meaningful information about personal insight or self-awareness of one's capabilities or performance. In turn, research has supported the idea that self-other agreement is related to workplace outcomes (Fleenor et al., 2010; Ostroff et al., 2004).

Taken together, this discussion highlights several findings that are relevant to the current study. First, self-ratings appear to inconsistently converge with the ratings of others. Second, although self-other ratings correlate modestly, there appears to be meaningful variation in the degree to which individuals provide convergent ratings, which can be viewed as an indicator of an individual's self-awareness. Third, such variation has important functional consequences in the workplace. In the following section, we consider the potential consequences of varying levels of self-awareness in the context of team functioning and performance.

Self-Awareness in Teams

As described earlier, self-awareness refers to accurately assessing and understanding one's performance capabilities and contributions (Church, 1997). Given that our context of interest is teamwork, we refer to self-awareness as the capacity to accurately assess and understand one's behavioral contributions *to the team*, with regard to individual-level preparation, execution, monitoring, and adjustment behavior. At its essence then, self-awareness is rooted in cognitions about oneself; by extension, a useful way to index the accuracy of such cognitions is by comparison to how others view the focal person (i.e., self-other agreement).

A common way of conceptualizing cognition in the literature on teams is with respect to the organized or structured knowledge that is *shared* among members (Klimoski & Mohammed, 1994). From this perspective, individuals are expected to form mental models or schemas that represent knowledge about the team as a collective unit, such as knowing the team's purpose, expertise among team members, team processes, and so forth (Marks, Sabella, Burke, & Zaccaro, 2002). These knowledge structures develop from experience, organize and store information, and direct attention and guide expectations (Rentsch, Small, & Hanges, 2008). Previous studies have largely emphasized the extent to which these schemas or mental models of team-level content are consistent or compatible across all members of a team (Mathieu, Heffner, Goodwin, Salas, & Cannon-Bowers, 2000), and results have supported a positive association between these emergent team-level mental models and team performance (DeChurch & Mesmer-Magnus, 2010). Although a focus on emergent team-level content has predominated the study of cognition in teams, mental models are recognized to be inherently individual; that is, these schemas originate in the individual cognitions of team members (Rentsch & Hall, 1994).

The recognition that schemas are individual-level cognitions holds three ramifications for the concept of self-awareness in teams. First, even in team contexts, self-awareness is an individual-level descriptor. It is the individual who is self-aware or not, as opposed to the overall team. This does not mean that teams, as a collective, are incapable of exhibiting shared understanding or sentiment among members, but the constituent elements of such phenomena reside in individual team member perceptions, cognitions, and affect (K. J. Klein

& Kozlowski, 2000). Second, the schemas of individual team members can compose team-level content (i.e., team mental models) as well as individual-level content pertaining to perceptions of oneself and one's behavior. This latter self-schema encompasses a person's knowledge about his or her contributions to the team and thus is an essential component of that person's self-awareness. Third, team member schemas are known to vary with regard to accuracy (Rentsch & Woehr, 2004), corroborating the notion that individuals will likely vary with regard to their self-awareness. This highlights the fact that a critical component of self-awareness is accuracy, which in the current study is reflected in levels of self-other agreement. In summary, we view self-awareness as a self-schema that reflects the accuracy with which one understands one's contributions to the team, where such accuracy is embodied in the amount of agreement between self-ratings and ratings furnished by one's teammates.

Situating self-awareness at the individual level does not negate its relevance to team outcomes. Self-awareness in teams matters to team-level consequences because team effectiveness requires the successful *integration* of individual contributions (Salas et al., 2005). Importantly, individual contributions are guided by the various schemas held by a team's members, which is a primary reason why schemas are thought to affect the efficiency of team-level processes and performance (Rentsch & Hall, 1994). Low levels of self-awareness indicate disparate views between self-schemas and teammates' perceptions, whereas high levels of self-awareness indicate more accurate self-schemas. The implication is that this accuracy (or inaccuracy) is likely to facilitate (or disrupt) the integration of individual contributions to team-level functioning (Rentsch & Klimoski, 2001). Furthermore, these effects should be influential over and above the amount or level of contributions that team members make because the compilational nature of team effectiveness necessitates that each member's contributions be collectively integrated with the contributions of other team members.

A valuable way to examine potential effects of self-awareness at the team level of analysis is to treat levels of self-awareness as an aggregated compositional feature of the team—that is, aggregating self-awareness to represent the overall degree to which team members possess accurate self-schema about their behavioral contributions to the team. Conceptualized in this way, self-awareness in teams is a *team composition variable* (Chan, 1998) that reflects a configural property of the team, where such properties “originate in, or emerge from, individual team members' experiences, attitudes, perceptions, values, cognitions, or behaviors” (K. J. Klein & Kozlowski, 2000: 215). Because self-awareness originates in individuals, self-awareness at the team level results from a fuzzy compositional process where the team-level conceptualization of self-awareness “maintains close links to the individual-level counterpart but nevertheless differs in subtle and important ways” (Bliese, 2000: 369). Self-awareness is a personal attribute at the individual level, whereas at the team level it is a descriptive property that captures the degree to which a team is composed of members with high or low self-awareness. This conceptualization allows us to describe the process by which self-awareness influences team effectiveness.

Self-Awareness in Teams and Team Effectiveness

A wealth of scholarship depicts team functioning in an IPO framework or, similarly, an input-mediator-outcome model that acknowledges the importance of additional nonprocess variables as intervening mechanisms (LePine et al., 2008). According to this framework, input variables affect team outcomes through various team-level processes or emergent

states. For its part, self-awareness represents an input factor in the IPO framework because it is conceptually anchored to team member schemas regarding the individual contributions they direct toward team functioning. In turn, operationalizing self-awareness as a descriptive property of teams reflects a team-level input factor that influences intervening team-level processes and emergent states, as well as team-level performance.

We tested the preceding suppositions with two team-level process variables (coordination and conflict) thought to be especially relevant during team performance episodes (Marks et al., 2001). We also included a commonly studied emergent state (cohesion) because such states can serve as mediators in models of team effectiveness (Marks et al., 2001). In short, *coordination* reflects how teams synchronize individual inputs for collective performance; *conflict* reflects how teams handle disagreement among members; and *cohesion* represents a shared commitment to the team. Although these variables do not represent an exhaustive list of processes and emergent states, they do reflect a representative set that is applicable to a majority of teams. Meta-analytic evidence also indicates that these variables are indicative of the quality of social interactions at the team level and exert highly similar effects on team performance (LePine et al., 2008).

Coordination

Coordination is a team-level process that involves the synchronization and organization of individual contributions in service of collective team goals (Marks et al., 2001). For example, when a high degree of coordination emerges, teams are more likely to collectively acknowledge and make the mutual adjustments necessary to improve team-level performance (Tesluk, Mathieu, Zaccaro, & Marks, 1997). In addition, the emergence of team coordination serves to minimize duplication or waste of individual efforts across a team's members (Spreitzer, Cohen, & Ledford, 1999), as well as to ensure that each individual's tasks are appropriately sequenced, synchronized, and well timed to accomplish the team's collective goals (Cannon-Bowers, Tannenbaum, Salas, & Volpe, 1995). As a result, teams that exhibit higher levels of coordination are able to perform more efficiently and effectively (LePine et al., 2008; Marks et al., 2002).

There are several reasons to suspect aggregate levels of self-awareness might affect team-level coordination. At its core, coordination requires the synchronization of individual contributions to achieve proper team-level functioning. Effective coordination thus requires that team members engage in mutual adjustments that benefit the team as a whole. At least part of this interdependent synchronizing requires team members to appropriately select specific tasks to perform to ensure assimilation of individual efforts into collective team-level output (Wageman, 1995). This necessitates choosing the right tasks at the proper time and avoiding duplication of efforts or the neglect of required task demands. Coordination also requires matching individual capabilities and resources to the collective demands of the team (Shea & Guzzo, 1989), which entails team members taking on tasks for which they have adequate time and sufficient expertise to complete. Thus, members must correctly assess their particular contributions to the team for the team to collectively engage in the appropriate mutual adjustments that lead to coordination (Rico, Sánchez-Manzanares, Gil, & Gibson, 2008).

However, it has been argued that individuals low in self-awareness are likely to have difficulty setting goals that correspond to actual capabilities, exert inappropriate levels of effort due to misdiagnosing personal contributions, and take on tasks for which they are either

over- or underqualified (Fleenor et al., 2010; Ostroff et al., 2004). By extension, these individuals are likely to disrupt the synchronization and mutual adjustments necessary for coordination to emerge at the team level. Thus, teams with lower aggregate self-awareness should be more likely to experience disruptions to coordination. Conversely, teams with higher aggregate self-awareness should be less likely to experience disruptions to coordination, as team members are better able to accurately recognize their own performance capabilities, personal resources, and task selection, all of which are needed for team-level coordination to emerge.

Evidence from related research supports the idea that self-awareness in teams can facilitate or impede the mutual adjustments needed for effective coordination. For example, evidence shows that anticipating environmental changes and the needs of others contributes to the emergence of collective strategies that can be applied to coordination (Entin & Serfaty, 1999). Research also shows that inaccurate self-views not only serve as faulty starting points for ensuing adjustments but also result in insufficient adjustments when they are made (Ehrlinger & Dunning, 2003). Such results suggest that low self-awareness in teams can have a deleterious “anchoring” effect whereby task selection and effort regulation among a team’s members are not effectively aligned with the team’s actual needs. Furthermore, research has found that these problems often derive from the fact that individuals’ self-assessments are based on an inside view of their situations, which causes them to misinterpret and even ignore outside information when they estimate and make decisions pertaining to task requirements (Buehler, Griffin, & Ross, 2002). Task requirements are interdependent in teams; thus, inaccuracies among members’ self-schemas are likely to degrade the mutual adjustments needed for team coordination to emerge.

Hypothesis 1: Lower self-awareness in teams is associated with lower team-level coordination.

Conflict

Conflict in teams reflects the disagreement and tension among team members that occurs in the context of completing team activities and goals (Jehn, 1995). Research on team conflict has historically made the distinction between relationship- and task-based conflict, with the former referring to incompatibilities surrounding personal preferences, values, or dispositions and the latter referring to disagreements about topics such as team resources, strategies, or task-relevant information. This distinction is grounded in the idea that relationship conflict is harmful for team functioning, whereas task conflict might be beneficial due to the elaboration of information pertinent to team goals. Despite this rationale, research has generally shown that relationship conflict and task conflict have negative effects (De Dreu & Weingart, 2003), although the negative effects of task conflict may be mitigated to the degree that different forms of conflict are perceived as distinct by team members (de Wit, Greer, & Jehn, 2012).

A careful consideration of the notion of team conflict suggests that it will follow from low levels of self-awareness. Regardless of whether it is characterized as relationship or task based, a fundamental feature of conflict is that it is a result of disagreement or incompatibilities among team members (de Wit et al., 2012). The lack of self-awareness in a team indicates the de facto presence of disagreements regarding individual-level contributions, which

are likely to foster conflict among team members for several reasons. First, individuals tend to consider their own perceptions of reality to be correct (Kunda, 1990) and believe that their self-views are more accurate than the views of others (Robinson, Keltner, Ward, & Ross, 1995). Such tendencies create asymmetries between self-perceptions and others' perceptions, which are known to increase attribution errors that lead to conflict and misunderstandings, such as illusions of personal objectivity, false consensus, and inferences that others are biased and misinformed (Pronin, Gilovich, & Ross, 2004). Second, self-other disagreement reflects incompatibilities among team members' self-schemas, and these can create disruptions that exacerbate interpersonal conflict in teams as individuals struggle to assert their own divergent self-schemas and hold less flexible interpretations about team functioning (Rentch & Zelno, 2003). Third, even if directly challenged, individuals with inaccurate self-schemas will tend to shift priority to goals that are aligned with self-views, emphasize counterfactual information that is self-enhancing, and react defensively to avoid perceived self-threat (A. H. Jordan & Audia, 2012). Given the interdependent nature of teams, these incompatibilities indicative of low self-awareness in teams are unlikely to go unnoticed or be resolved in a swift and easy manner.

Related research also lends support to the stipulation that teams with lower levels of self-awareness will experience increased levels of team conflict. For instance, evidence has shown that when team members have disparate views regarding the time urgency associated with completing team tasks, increased levels of relationship conflict are likely to occur (Mohammed & Angell, 2004). Additionally, peers often describe individuals low in self-awareness in negative terms, such as *defensive* and *hostile* (Colvin, Block, & Funder, 1995), suggesting that such individuals are viewed as intransigent and self-serving. Teams with lower self-other agreement about each member's level of influence also have more uncertainty regarding the team's hierarchy, which in turn fails to provide the internal scripts needed to alleviate competitive behaviors underlying conflict (Greer, Caruso, & Jehn, 2011). Conversely, increased levels of agreement among team members about task performance are known to reduce conflict associated with collective decision making (Hollenbeck et al., 1995). Lower aggregate self-awareness also indicates a team in which members hold inconsistent perspectives of one another, and a lack of shared perspectives can increase interpersonal aggression (Richardson, Hammock, Smith, Gardner, & Signo, 1994). Following this line of reasoning, we hypothesized,

Hypothesis 2: Lower self-awareness in teams is associated with higher team-level conflict.

Cohesion

Unlike coordination and conflict, which represent team processes reflecting the nature and quality of team-level interactions, team cohesion is best conceptualized as an emergent affective state (DeChurch & Mesmer-Magnus, 2010). Important components of cohesion in teams include feelings of interpersonal attraction among members, commitment to team goals, and pride with regard to group activities, which together characterize the degree of a team's cohesiveness (Beal et al., 2003). A large body of research has supported the positive relationship between team cohesion and team performance (Beal et al., 2003; Chiochio & Essiembre, 2009).

Prior theory applied to understanding cohesion in teams suggests the potential for an association between aggregate self-awareness and levels of team cohesion. For example, authors have noted the relevance of social exchange theory for the development of team-level cohesion (Kozlowski & Chao, 2012). Social exchange theory implicates the importance of reciprocity, trust, and fulfillment of mutual expectations in relationships and interdependent interactions (Cropanzano & Mitchell, 2005)—which has clear relevance to teams in that teamwork necessitates interdependent interactions. To the extent that team members collectively experience positive reciprocal relationships with one another, this will engender positive feelings about the team as a whole. Of particular relevance, a prerequisite for the fulfillment of reciprocal expectations is a common view of each party's contributions and obligations. To the extent that there are differing views of an individual's contribution to the team, expectations related to these contributions will likely be violated, which in turn may harm feelings of trust, satisfaction, and commitment (Colquitt, LePine, Piccolo, Zapata, & Rich, 2012; Dirks & Ferrin, 2002). Relatedly, low levels of self-awareness indicate that there are differing views within a team regarding contributions, which suggests the increased likelihood of perceived violations of performance-related expectations. As a consequence, violated expectations have the subsequent potential to damage positive affective associations with the team, such as attraction, commitment, and pride (i.e., feelings of cohesion).

Beyond this, other streams of research provide indirect support for an association between aggregate levels of self-awareness and team cohesion. For example, the work of Galinsky, Ku, and Wang (2005) regarding perspective taking suggests that self-other overlap in cognitive representations has the potential to foster social bonds. While perspective taking is qualitatively different from self-awareness, such research does support the contention that having similar views as one's teammates might facilitate social connections and feelings of cohesion. Research on social loafing also suggests that individuals are generally unaware that their lack of contribution is noticed by others and that when peers hold low expectations of performance, it increases social loafing (Karau & Williams, 1993), which is in turn associated with less team cohesion (Liden, Wayne, Jaworski, & Bennett, 2004). Last, making individual contributions that are effective and self-aware is an important way that team members communicate their commitment and affinity to the team's collective success, which in turn can promote task unity and positive affect (Baumeister & Leary, 1995; Carron & Brawley, 2012). We therefore hypothesized,

Hypothesis 3: Lower self-awareness in teams is associated with lower team-level cohesion.

Team Performance Outcomes

The preceding predictions posit the effects of self-awareness in teams on three functional outcomes. As previously discussed, in the IPO framework, both process variables and emergent states can mediate "input" factors, such as self-awareness in teams, on subsequent team-level outcomes. Research has found that coordination and cohesion are generally and positively related to team outcomes, whereas conflict has been shown to be negatively or unrelated to team outcomes (LePine et al., 2008; Marks et al., 2002; Mathieu et al., 2008). Teams with higher levels of coordination are more apt to make modifications to overall functioning and more efficiently integrate individual efforts into collective performance (Spreitzer, et al., 1999; Tesluk et al., 1997). Higher levels of cohesion promote more commitment among

teammates and to team goals and activities, as well as more efficient use of team resources (Beal et al., 2003). Finally, conflict is thought to detract from the resources needed for task performance (De Dreu, 2008) and to reduce collaborative problem solving (De Dreu, 2006), thus leading to deleterious effects on distal team outcomes in general (de Wit et al., 2012). Consistent with the IPO framework and such evidence, we expected that the effects of self-awareness in teams would be conveyed by coordination, conflict, and cohesion on subsequent team performance.

Hypothesis 4: The effects of self-awareness in teams on team performance will be mediated by team coordination, conflict, and cohesion.

The arguments advanced here are based on the notion that any form of discrepancy in self-other agreement will be problematic in a team context. Beyond the overall effects of self-awareness in teams, it is possible that particular forms of self-other agreement may hold more or less influence. For example, overrating is a form of self-other discrepancy where individuals rate themselves more favorably than the ratings provided by others, whereas underrating occurs when individuals rate themselves less favorably versus others' ratings. From a team composition perspective, these different forms of self-other discrepancy mean that the lack of self-awareness in some teams could be due to particular forms of self-other discrepancy. Therefore, we explored if over- or underrating hold more specific influences on team-level functioning. On the basis of these considerations, we proposed the following research question:

Research Question: Does the particular form of self-other disagreement in teams (i.e., over- or underrating) show differential effects on team-level functional outcomes?

Method

Database and Procedure

Data for our study were from a commercially available assessment instrument offered by Capsim Management Simulations (<http://www.capsim.com>). The assessment software TeamMATE is an online peer ratings platform that captures individual- and team-level factors that relate to effective team functioning. The archival data set used for the current study included data from 2,658 individuals across 515 teams. These individuals were undergraduate and graduate students enrolled in business strategy courses. The 515 teams had a range of membership from 3 to 12 individuals ($M = 5.16$, $SD = 2.36$), and 49% of the sample was composed of teams with 4 or 5 members. Of the 2,658 individuals in the data set, 42% were female.

The specific instructional setting in which the TeamMATE assessments were conducted was a business simulation entitled Capstone, also offered by Capsim. This simulation can be implemented as a team-based exercise or completed individually. Only data from team-based implementations were used in this study. In brief, Capstone requires individuals to make complex sets of decisions involving all aspects of a business's operation, which necessitates cross-functional integration and business strategy to be successful. This simulation was used in several previous studies from the team learning and performance literature (e.g., Dierdorff,

Bell, & Belohlav, 2011; Mathieu & Rapp, 2009). Participants in our sample made these decisions together, working as “top management teams” of their simulated firms. These firms competed in a real-time interactive decision-making environment against other firms (teams) in the same course. Capstone mimics a dynamic marketplace in which customer preferences, technology, and competition are continually shifting. Teams were required to make a variety of operating decisions in functional areas such as marketing, production, research and development, human resources, and finance. These decisions required in-depth analysis and discussion of internal and external information (e.g., sales, labor costs, financial data, production capacity). Simulation performance occurred across seven or eight simulated years, or “decision rounds.”

Participants completed TeamMATE as part of their simulation experience. In short, TeamMATE is designed to use peer ratings to assess components of teamwork at the individual and team levels as derived from evidence in the team effectiveness literature, including narrative reviews and meta-analyses (Capsim Management Simulations, 2014). Participants rated themselves and others on individual-level behavior related to preparation, execution, monitoring, and adjustment. They also rated their teams on various team-level dimensions, including cohesion, coordination, and conflict. TeamMATE was completed on two occasions, early in the simulation after two or three decision rounds and then during Round 5 or 6. The individual-level data used to operationalize self-awareness were from the first assessment, and the team-level functional outcomes were from the second assessment. Team performance outcomes came from the final simulation round (Round 7 or 8). The separation of measurements created temporal precedence for testing our hypotheses.

Measures

Individual-Level Performance Contributions (Time 1). The TeamMATE instrument uses 16 items to operationalize individual behaviors that contribute to teamwork. These items span four behavioral domains: preparation, execution, monitoring, and adjustment. Preparation involves individual teamwork behaviors pertaining to analyzing and planning activities that enable performance. A sample item is “participates in developing a plan to achieve team goals.” Execution behaviors encompass collaborating and accomplishing team tasks. A sample item is “works with others to accomplish team tasks.” Monitoring behaviors pertain to assessing and evaluating ongoing performance. A sample item is “recognizes mistakes or performance discrepancies.” Adjustment entails individual teamwork behaviors related to adapting and generating performance improvements. A sample item is “works with others to develop potential solutions to performance problems.” All items used a 5-point Likert scale with descriptors ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

Scale development work supports favorable psychometric properties based on reliability intraclass correlation coefficient (ICC) estimates, $ICC(1) = .43$ to $.46$ and $ICC(2) = .95$ to $.96$, and construct-related validity evidence from confirmatory factor analysis (four-factor model fit, comparative fit index [CFI] = $.98$, root mean square error of approximation [RMSEA] = $.06$, and standardized root mean square residual [SRMR] = $.03$; Capsim Management Simulations, 2014). Confirmatory factor analysis on the current study’s sample also provided construct-related validity evidence, as fit indices supported a four-factor model ($\chi^2 = 2,277.44$, $df = 94$, $p < .01$; CFI = $.96$; RMSEA = $.06$, 95% CI [$.059$, $.064$]; SRMR = $.03$). To facilitate

hypothesis testing, we created a composite score across the four individual teamwork behavior domains. Empirical support for creating this composite was provided by results from a bifactor confirmatory factor analysis model positing a general individual teamwork behavior factor in addition to the four separate factors. This model provided an adequate fit to the data ($\chi^2 = 1,735.03$, $df = 88$, $p < .01$; CFI = .98; RMSEA = .05, 95% CI [.052, .057]; SRMR = .01), and results suggested an improvement in fit over the four-factor model ($\Delta\chi^2 = 542.41$, $p < .01$, $\Delta df = 6$; $\Delta CFI = .02$) with reductions in Akaike and Bayesian information criteria (530.40 and 490.07, respectively). Coefficient alpha was .96 for the composite. Estimates of ICC(1) and ICC(2) were .30 and .70, respectively, suggesting support for a rating target effect and aggregation of others' ratings.

Team-Level Functional Outcomes (Time 2). Three dimensions from the TeamMATE instrument were used to operationalize team-level processes and emergent states. Scale development work has shown favorable psychometric properties with ICC(1) estimates of .27, .30, and .22 and ICC(2) estimates of .90, .88, and .87 for coordination, cohesion, and conflict, respectively (Capsim Management Simulations, 2014). Confirmatory factor analysis on the current sample provided evidence of construct-related validity and differentiation, with several fit indices showing adequate fit and thus providing moderate support for a three-factor model ($\chi^2 = 1,172.35$, $df = 41$, $p < .01$; CFI = .94; RMSEA = .08, 95% CI [.070, .100]; SRMR = .04). The three-factor model also showed improved fit over a one-factor model ($\Delta\chi^2 = 12,294.60$, $\Delta df = 3$, $p < .01$; $\Delta CFI = .65$) with reductions in Akaike and Bayesian information criteria (12,288.61 and 12,271.13, respectively). Sample scale reliabilities are described here. Unless otherwise noted, all measures used a 5-point Likert scale with descriptors ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

Team coordination. A four-item scale measuring levels of integration of individual efforts toward team goals assessed coordination. A sample item is "My team clarifies the roles and the responsibilities of each member." The coefficient alpha for individual-level ratings was .88. Estimates for ICC(2) and ICC(1) were .87 and .36, respectively, indicating acceptable group mean reliability and suggesting support for the aggregation of ratings to the team level.

Team conflict. A four-item scale measuring levels of disagreement and friction among team members assessed conflict. A sample item is "How often are there personality conflicts in your team?" The coefficient alpha for individual-level ratings was .91. Estimates of ICC(2) and ICC(1) were .87 and .27, respectively, indicating acceptable group mean reliability and suggesting support for the aggregation of ratings to the team level. Conflict was captured with a 5-point Likert scale representing frequency and ranging from 1 (*never*) to 5 (*always*).

Team cohesion. A three-item scale measuring levels of shared commitment and affinity toward the team operationalized cohesion. A sample item is "My team has a shared commitment to performing well." The coefficient alpha for individual-level ratings was .87. ICC(2) and ICC(1) were .86 and .38, respectively, indicating acceptable group mean reliability and suggesting support for the aggregation of ratings to the team level.

Team-Level Performance (Time 3). Team performance was operationalized with scores produced by the simulation, which requires teams to make and integrate decisions across the major functions of business; thus, team performance is calculated with a holistic evaluation that takes into account multiple forms of performance. To accomplish this aim, team performance is based on the “balanced scorecard” framework (Kaplan & Norton, 1996), which assesses simulated company performance with metrics pertaining to finance (e.g., stock price), internal business process (e.g., contribution margins), learning and growth (e.g., workforce productivity), and customer service (e.g., customer awareness). An overall aggregate scorecard result from the team’s final simulation round was used to capture team performance. This score was the percentage of the total possible points that a team could earn on the balanced scorecard.

Control Variable. We controlled for overall levels of individual performance because we predicted that aggregate self-awareness matters beyond the amount of individual-level contributions in a team. This effect is also important to control because increased performance of individual behaviors can result in increased team functioning, as team outcomes are a product of individual actions in a collective unit (Ellington & Dierdorff, 2014). The variable calculated as a team’s average rating on the individual behavior composite, excluding self-ratings.

Analytical Approach

Self-awareness was operationalized as self-other agreement and estimated with polynomial regression and response surface modeling (Edwards & Parry, 1993). In our study, this entailed extending these approaches to a multilevel context where the independent variables were individual level (Level 1) and the dependent variables were team level (Level 2). We thus used multilevel structural equations modeling to model a reflective Level 2 latent variable for each of the five Level 1 variables that constitute the polynomial equation (X , X^2 , Y , Y^2 , and XY). These Level 2 latent variables collectively served as an aggregate representation of team member self-awareness and correspondingly captured between-team differences in self-awareness on a continuous latent scale at the team level. The five latent variables were Level 2 predictors of the three Level 2 mediators, with the Level 2 path estimates used to test Hypotheses 1, 2, and 3.

We used response surface modeling to examine the slopes and curvatures along the lines of congruence and incongruence, which revealed the effects of self-other (dis)agreement with four parameter estimates (Edwards & van Harrison, 1993). Hypotheses 1–3 predicted that lower self-awareness in teams, as self-other agreement diverges, is associated with lower functional outcomes. Thus, estimates along the line of incongruence, either for the slope (a_3) or the curvature (a_4), are pertinent to testing Hypotheses 1–3. In the graphs, surfaces that slope downward away from the line of congruence (upward for team conflict) would indicate that decreases in self-awareness in teams (increases in self-other discrepancies) are associated with poor team-level functioning and would offer support for Hypotheses 1–3. The response surfaces also provided results for our research question about the direction of discrepancy. For example, a response surface showing that the lowest values for

team coordination occur when self-ratings are higher than other ratings indicates that overrating is a particularly deleterious form of self-awareness.

To test the mediation predicted in Hypothesis 4, the Level 2 path estimates were used to construct "block variables" (Heise, 1972). We created three block variables, one for each team-level mediator as the dependent variable (see the online supplemental material for more details). With the control variable for overall levels of individual contribution, the block variables were used as predictors for examining the indirect effects of team self-awareness on team performance. All predictors and mediators were scale centered by subtracting the midpoint of the scale (Edwards, 1994). We simultaneously modeled the mediators in testing Hypothesis 4.

Results

Table 1 presents descriptive statistics for team-level variables. Overall mean levels of individual contributions were related to coordination, conflict, cohesion, and team performance, confirming the importance of controlling for this variable during hypothesis testing. Conflict was negatively related to coordination, cohesion, and team performance, whereas cohesion and coordination were positively correlated with one another and with team performance. At the individual level, self and other ratings were positively correlated ($r = .42, p < .01$).

Hypothesis 1 predicted that lower self-awareness in teams is associated with lower team coordination. Table 2 shows coefficients from the polynomial regressions, as well as the slopes and curvature along the congruence and incongruence lines in predicting team coordination. Figure 1 depicts the response surface derived from these estimates. The latent variables representing the Level 2 polynomials accounted for a 65% reduction in the residual variance of team coordination beyond the control variable of overall levels of individual performance (pseudo- $R^2 = .65$). Results showed that the parameter estimates for slope (a_1) and curvature (a_2) along the line of congruence were not significant. Pertinent to testing our hypothesis, results also showed significant parameters for slope ($a_3 = -.90, p < .01$) and curvature ($a_4 = .52, p < .05$) for the relationship between team self-awareness and coordination along the line of incongruence. These results suggest that as self-other discrepancies increase, coordination decreases; however, the effect is nonlinear. The response surface displays this more nuanced relationship (Figure 1), showing that coordination is lowest when the lack of team self-awareness is due to overrating. The surface further reveals, however, that coordination is highest when the lack of team self-awareness is due to underrating. Collectively, these results provide partial support for Hypothesis 1 in that lower team self-awareness was related to lower coordination, but this decrement occurred only when discrepancies were characterized by overrating.

Hypothesis 2 predicted that lower self-awareness in teams is associated with higher team conflict. Table 2 shows the parameters for the slopes and curvatures along the lines of congruence and incongruence in predicting team conflict. The Level 2 polynomials accounted for a 29% reduction in the residual variance of team conflict beyond the control variable (pseudo- $R^2 = .29$). The slope and curvature along the line of congruence were not significant, nor was the slope along the line of incongruence. However, the curvature along the line of incongruence was positive and significant ($a_4 = 1.29, p < .01$), indicating a nonlinear relationship between team self-awareness and conflict where increases in self-other discrepancies are associated

Table 1
Means, Standard Deviations, and Correlations for Team-Level Variables

Variable	<i>M</i>	<i>SD</i>	1	2	3	4
1. Average teamwork behavior	4.47	0.36				
2. Team coordination	4.36	0.46	.59**			
3. Team conflict	2.32	0.66	-.21**	-.18**		
4. Team cohesion	4.55	0.41	.53**	.85**	-.27**	
5. Team performance	0.63	0.12	.22**	.24**	-.17**	.26**

Note: $N = 515$ teams. Team-level self-awareness was operationalized with polynomial regression and thus is not shown as a single variable in this table. Variable 1 is a team's mean level of individual teamwork behavior among its members (excluding self-ratings) and is used as a control.

** $p < .01$ (two-tailed).

Table 2
Effects of Aggregated Self-Awareness on Team-Level Functional Outcomes

Variable	Coordination		Conflict		Cohesion	
	Estimate	<i>SE</i>	Estimate	<i>SE</i>	Estimate	<i>SE</i>
Average teamwork behavior	.46**	.13	-.17	.39	.45**	.12
Self-ratings	-.59**	.08	-.25	.53	-.51*	.21
Other ratings	.31**	.10	-.20	.19	.58**	.13
(Self-ratings) ²	.14	.13	.31	.22	.04	.17
(Other ratings) ²	-.33**	.11	-.42*	.20	-.35*	.14
Self-Ratings $\times$ Other Ratings	.33*	.16	.56**	.21	.05	.20
Congruence (self = other)						
Slope (a_1)	-.28	.16	-.45	.37	.08	.27
Curvature (a_2)	.04	.20	.46	.34	-.26	.24
Incongruence (self $\neq$ other)						
Slope (a_3)	-.90**	.09	-.05	.72	-1.08**	.21
Curvature (a_4)	.52*	.25	1.29**	.40	.42	.33

Note: $N = 2,658$ individuals, $N = 515$ teams.

* $p < .05$ (two-tailed).

** $p < .01$ (two-tailed).

with increased conflict. Figure 2 plots the response surface for the relationship between team self-awareness and team conflict. Here, as team self-awareness decreased, levels of team conflict increased. From Figure 2, similarly high levels of team conflict occurred at both ends of the line of incongruence. These results support the predicted effects specified by Hypothesis 2. Per our research question about the form of team self-awareness discrepancy, under- and overrating appear to similarly exacerbate team conflict.

Hypothesis 3 predicted that lower self-awareness in teams is associated with lower team cohesion. Table 2 shows that, after controlling for overall levels of individual performance, the slope and curvature along the line of congruence were not significant. Along the line of incongruence, the slope was negative and significant ($a_3 = -1.08$, $p < .01$). The Level 2

Figure 1
Effects of Aggregate Self-Awareness in Teams on Team Coordination

Figure 2
Effects of Aggregate Self-Awareness in Teams on Team Conflict

polynomials accounted for a 64% reduction in the residual variance of team cohesion beyond the control variable (pseudo- $R^2 = .64$). The significant slope parameter along the incongruence line indicated that as team self-awareness decreased, levels of team cohesion decreased. The response surface shown in Figure 3 revealed a more complex relationship. Here, the lowest levels of cohesion occurred when low team self-awareness was due to overrating. Yet, when underrating characterized low team self-awareness, team cohesion was highest, especially at the extreme (very low self-ratings, very high other ratings). These results provide partial support for Hypothesis 3 in that lower team self-awareness was related to lower team cohesion. Yet, this deleterious effect occurred only when discrepancies were characterized by overrating.

Hypothesis 4 predicted that the three functional variables would mediate the effects of self-awareness in teams on subsequent team performance. To test this hypothesis, we

Figure 3
Effects of Aggregate Self-Awareness in Teams on Team Cohesion

simultaneously entered all three mediators into an estimated path model. The antecedents in this model were block variables that reflected the composite effects of self-other (dis)agreement (i.e., self-awareness in teams) on the mediators and, ultimately, team performance. Fit statistics for this model were supportive ($\chi^2 = 22.96$, $df = 6$, $p < .01$; CFI = .98; RMSEA = .07, 95% CI [.04, .09]; SRMR = .01). Table 3 provides results from this model, including the indirect effects of team self-awareness on team performance through each mediator. Note that none of the direct effects from the block variables representing self-other (dis)agreement on team performance were statistically significant. Results in Table 3 indicate that only team conflict was a significant mediator (estimate = $-.010$, $SE = .005$, $p < .05$, bootstrap 95% CI [$-.025$, $-.002$]). Taken collectively, these results provide only partial support for Hypothesis 4 whereby the effects of self-awareness in teams in our data were conveyed by team conflict but not team coordination and cohesion.

Discussion

The present study sought to introduce empirical data to an underdeveloped area in the literature on teams by examining the extent to which self-awareness among a team’s members influences team-level outcomes. We integrated scholarship on individual cognition in teams to develop hypotheses that teams composed of individuals with greater levels of self-awareness are more likely to reap favorable team functioning and performance outcomes. We examined the influence of aggregate levels of self-awareness in teams on three team-level functional outcomes—coordination, conflict, and cohesion. Consistent with an IPO framework of team effectiveness, we further tested these functional outcomes for potential mediation of aggregated self-awareness on subsequent team-level performance. Finally, we examined the influence of various forms of self-awareness to more fully understand the sources and impact of self-awareness in teams. Overall, our results support the premise that self-awareness in teams is an important team compositional attribute that contributes to team functioning and performance effectiveness.

Table 3
Mediated Effects of Aggregated Self-Awareness on Team-Level Performance

Variables	Estimate	SE	Bias-accelerated 95% CI	
Outcome = coordination				
Average teamwork behavior	.36**	.12		
Team self-awareness ^a	.09**	.02		
R ²	.37**	.04		
Outcome = conflict				
Average teamwork behavior	.29**	.07		
Team self-awareness ^b	.51**	.11		
R ²	.06**	.02		
Outcome = cohesion				
Average teamwork behavior	.08	.19		
Team self-awareness ^c	.50**	.18		
R ²	.33**	.04		
Outcome = team performance ^a				
Team self-awareness ^a	−.01	.01		
Team self-awareness ^b	−.02	.04		
Team self-awareness ^c	.02	.07		
Average teamwork behavior	.08*	.04		
Coordination	.03*	.01		
Conflict	−.02*	.01		
Cohesion	.04*	.02		
R ²	.09**	.02		
Indirect effects				
Coordination	.003	.002	−.001	.008
Conflict	−.010*	.005	−.025	−.002
Cohesion	.020	.015	−.006	.055

Note: Average teamwork behavior is a control; 95% confidence intervals (95% CIs) are derived from 1,000 bootstrap draws.

^aBlock variable for coordination.

^bBlock variable for conflict.

^cBlock variable for cohesion.

* $p < .05$ (two-tailed).

** $p < .01$ (two-tailed).

It is important to reiterate our contention that the effects of self-awareness in teams matter over and above the amount of contributions that team members make, which is why we controlled for overall levels of individual performance in teams throughout our analyses. The compilational nature of team effectiveness necessitates that each member's contributions be collectively integrated with the contributions of others; thus, without accurate self-awareness, it should be difficult for a team's members to adequately align their contributions with the interdependent task demands of the team. Taken collectively, our findings generally reveal that when teams are composed of members with more discrepant self-schemas about their contributions, team coordination and cohesion suffer, and conflict is exacerbated. However, we also find that for certain aspects of team functioning, the effects of low self-awareness depend on the nature of self-other discrepancies. Such results paint a more

complex picture of how a lack of percipience among team members comes to shape team functioning and performance.

Substantial research corroborates the supposition that teams demonstrating high levels of coordination (i.e., task synchronization) and cohesion (i.e., shared commitment) achieve high levels of performance. We hypothesized that teams with lower levels of aggregate self-awareness would be constrained in their coordination capabilities as team members inaccurately assess their various contributions. We further predicted that divergent perceptions of individual contributions were likely to erode feelings of attachment to the team, leading to less cohesion. While our results revealed that low self-awareness in teams was associated with reduced coordination and cohesion, these deleterious effects were evidenced only when self-ratings were higher than others' ratings. For both these outcomes, overrating was damaging to team-level functioning. With regard to coordination, such findings suggest that inaccurate self-schemas that overvalue individual contributions to the team impede the team's capacity to collectively integrate these contributions. This is consistent with the supposition that coordination requires behavioral adjustments that are predicated on team members correctly assessing their own levels and types of performance contributions (Rico et al., 2008). As for cohesion, inaccurately overvaluing individual input could inhibit contributions that are timely, appropriate, and effective. To other team members, this might be construed as social loafing, which has been linked to lower cohesion in teams (Liden et al., 2004). Another explanation could be that overraters hold more individualistic orientations. For example, research by Korsgaard, Meglino, and Lester (2004) showed that individuals who tend to be more individualistic are more lenient in the self-ratings as compared with supervisory ratings. Overraters may therefore act in ways that are less collectivistic, thereby reducing mutual feelings of team commitment and interpersonal attraction. Finally, the pattern of results for overrating is concordant with control theories of motivation (e.g., H. J. Klein, 1989), where a general supposition is that those who personally believe that they are performing consistently with expected standards (as overraters might, albeit inaccurately) could actually reduce task-focused effort to direct the effort elsewhere in need of greater perceived attention.

A surprising pattern of results for coordination and cohesion was that when self-other discrepancies were in the form of underrating, levels of these outcomes were high. This suggests that when team members undervalue their contributions relative to how others assess these contributions, it somehow fosters mutual integration of tasks and affective connections to the team. It could be that, unlike overrating, which reflects tendencies toward self-enhancement, underrating reflects the absence of self-enhancement tendencies. Because self-enhancement bias often results in behaviors such as ignoring criticism or reacting defensively toward others (A. H. Jordan & Audia, 2012), perhaps these negative outcomes are avoided in low self-awareness teams characterized by underrating. Alternatively, high levels of underrating could be due to high performers who simply underestimate their contributions (Dunning, 2012); thus, this form of low self-awareness in teams might actually coincide with high levels of individual contributions. However, this is unlikely because we controlled for individual levels of performance in teams. Another possible explanation is that underrating might be a way to manage impressions through ingratiation via self-deprecation (Gordon, 1996). This is consistent with research showing that ingratiation is associated with more positive evaluations of work performance and interpersonal attraction in general (Higgins, Judge, & Ferris, 2003), as well as more cooperation and interpersonal liking among team members in particular (Nguyen, Seers, & Hartman, 2008). Finally, those who believe that

they are performing poorly or below expected standards (as underraters might) could focus efforts toward improving performance to meet these perceived expectations. Team-level functioning is predicated in part on “interdependent feedback loops” that compete for individuals’ attentional resources (Park, Spitzmuller, & DeShon, 2013). Thus, when team members undervalue their contributions, it could lead them to shift more of their cognitive resources toward team goals to remedy this perceived discrepancy, which would likely increase coordinated actions and commitment to the team’s goals.

With regard to team conflict, we hypothesized that when inaccurate self-schemas were prevalent within a team, increased team-level conflict would ensue. Our results confirm that conflict is higher among teams with lower aggregate self-awareness. Moreover, unlike coordination and cohesion, the form of self-other discrepancies did not matter for team conflict. High levels of team conflict were evidenced when low self-awareness in teams was characterized by either over- or underrating, suggesting that the mere existence of low self-awareness exacerbates friction and discord among team members. A fundamental feature of conflict is the presence of disagreement among individuals, without which there is no cause for conflict. Our results suggest that low levels of self-awareness—that is, disagreement with others about one’s individual contributions to the team—is sufficient to sow the seeds of conflict irrespective of the direction of that disagreement. Such findings are consistent with the suppositions that, within group settings, inaccurate self-schemas create asymmetries in perceptions that lead to increased conflict and misunderstanding (Pronin et al., 2004) and create less flexible perceptions about team functioning that increase interpersonal conflict (Rentsch & Zelno, 2003).

Our examinations additionally invoked a general IPO framework where we predicted that team-level processes and emergent states would mediate the effects of aggregate self-awareness on team performance. Results indicated that when these mediators were simultaneously examined, the effects of self-awareness on team performance were transmitted only through team conflict. In supplementary tests, we examined whether coordination and cohesion independently mediated the effects of self-awareness on subsequent team performance. Results revealed that coordination and cohesion significantly conveyed the effects of self-awareness when considered independently (indirect effect = .005, $p < .05$, 95% CI [.002, .011], for coordination; indirect effect = .042, $p < .01$, 95% CI [.016, .074], for cohesion). One reason for the differences between the simultaneous and independent tests of mediation is that there were relatively high correlations between coordination and cohesion ($r = .77$ in the path model), which may in part account for why only a single mediator was significant when simultaneously considered. Nonetheless, team processes and emergent states rarely occur in isolation, and research has shown that team processes and emergent states are correlated and display comparable effects on team performance (LePine et al., 2008). In our data, the consequences of self-awareness in teams were primarily conveyed via team conflict, while coordination and cohesion appear to represent important but secondary mechanisms.

What is interesting from our examinations is that self-awareness in teams appears to account for more variance in coordination and cohesion (36% and 33%, respectively) as compared with team conflict (8%). Yet, conflict is the key factor that ultimately conveys the effects of self-awareness in teams on team performance. The measure that we used to capture team conflict did so in general and thus did not demarcate different forms of team conflict (e.g., task or relationship conflict). In this sense, our results parallel meta-analytic evidence (de Wit et al., 2012) showing that when task and interpersonal conflict co-occur in teams,

which our study likely captured, negative consequences for team performance are likely to manifest. Another possibility is that in our sample, team conflict acted as the most proximal behavioral expression of how teams engaged in the performance of collective tasks. For example, research suggests that the differential outcomes of conflict that are so often observed in the literature are attributable to collective versus individualistic approaches to managing the emergence of conflict (see DeChurch, Mesmer-Magnus, & Doty, 2013). Teams that engage in more collectivistic processes are thought to benefit from conflict because of their shared commitment to goals and openness to collaboration, whereas teams that engage in more individualistic processes promote competition and avoidance. Teams with higher levels of coordination and cohesion may be more prone to invoke more collectivistic conflict processes associated with higher team performance. To clarify these findings, future research is needed that directly captures how the emergence of conflict is managed and what role self-awareness plays in this process.

Finally, our results provide a meaningful complement to individual-level studies examining the Dunning-Kruger effect, which describes the phenomenon whereby individuals who most lack the capacity to recognize and accurately rate their performance deficiencies are also those far more likely to be poor performers across a host of domains (Zell & Krizan, 2014). A close examination of this literature finds a heavy focus on low self-awareness relative to domains that are technical or highly cognitive (e.g., academic ability, language competence, medical skills). Our study thus contributes unique evidence by showing that the deleterious effects of low self-awareness are also applicable to interpersonal capacities required to perform in team contexts. Our results further build on this notion by demonstrating that self-awareness deficits at the individual level have concomitant detrimental effects at the team level as well.

Study Limitations

Our findings should be considered with respect to study limitations. First, we used several measures derived from the same individuals, increasing the potential that some observed variance is due to common method—despite efforts to temporally separate measures, use different item referents, and use distinct operationalizations at the team level. Second, we employed a complex team-based task that extends over 5 weeks with real consequences for performance; however, we cannot definitively draw causal inferences, as none of the variables were directly manipulated. Third, although the team project involved an ongoing high-fidelity task that mirrors the decision environment faced by many real-world teams, the teams used in this study were student teams. Finally, concomitant to the unique nature of our study, we applied a novel analytical approach to fit our multilevel examinations. Given this situation, we examined our data against two alternative approaches (absolute difference scores and polynomial regression on disaggregated data). Analyses showed consistent findings for the influence of self-awareness on coordination, cohesion, and conflict (see online supplemental material for details).

Implications for Future Research and Practice

The present study raises new questions in the pursuit of understanding effective team functioning, especially with regard to team member cognition. On the surface, aggregate

self-awareness and team mental models share a conceptual basis that is rooted in individual cognitions. Team mental models, however, refer to compatible or shared cognitions among team members regarding team-level content, whereas self-awareness refers to self-schemas that reflect individual-level content. In this light, one broad implication from our study is that team effectiveness requires that team members not only share a common view about the team itself but also hold accurate self-schemas about how they individually contribute to the team.

Viewing self-awareness in teams from the perspective of team member cognitions suggests several areas for future research. Here, research is needed that seeks to understand how self-schemas and team-level mental models are related. It may be that self-schemas play an important role in promoting a consensus related to team-level content, whereby accurate self-schemas of individual contribution allow for the formation of shared perceptions of team-level phenomena. Alternatively, self-awareness and team mental models may operate simultaneously and at different levels to influence team effectiveness. We examined the accuracy of schemas in relation to self-other agreement about one's contributions to the team (i.e., self-schemas). Others have proposed that team member schemas can capture the accuracy with which members understand how their teammates view them, suggesting that at the team level these schemas reflect levels of "team meta-accuracy," which are thought to promote team effectiveness (Rentsch & Woehr, 2004). Future research is needed that examines this latter form of accurate "other awareness" in relation to the self-awareness conceptualization in this study.

The recognition that mental models or schemas in teams originate in individuals guided our theorizing about the effects of self-awareness in teams. This recognition also implies that self-awareness and phenomena such as team mental models are likely influenced by similar individual capacities for perceptivity. Those who are perceptive enough to hold accurate self-schemas may be more likely to be similarly perceptive about their surrounding environment such that they would also hold more accurate schemas about team-level content. In this vein, it would be valuable to incorporate individual differences in future studies. For instance, self-monitoring was found to predict self-awareness in leadership (Church, 1997), and agreeableness was shown to promote team mental models (Fisher, Bell, Dierdorff, & Belohlav, 2012). In addition, factors such as cognitive complexity, which reflects the ability to differentiate social information in a multidimensional manner (Bieri, 1955), seems particularly relevant for the accuracy of team member schemas. Self-appraisals in organizations often occur in the context of performance evaluation. Some research has shown that evaluation expectancy improves the accuracy of self-assessments (e.g., Sedikides, Herbst, Hardin, & Dardis, 2002), whereas other studies found that inaccurate self-appraisals are quite persistent even in contexts that reinforce accuracy, such as those with incentives or accountability (Ehrlinger, Johnson, Banner, Dunning, & Kruger, 2008). Finally, the nuanced results that we uncovered regarding the specific form of self-schema discrepancies reveals an interesting area for future research. In particular, explorations are needed to examine the intrapsychological processes that occur when team members under- or overrate and how these processes lead to different behavioral changes that ultimately affect team functioning.

With respect to practice, our findings indicate that self-awareness in teams should be actively managed. The consequences for team effectiveness that we found suggest that investments in improving aggregate self-awareness can result in sustained improvement. The most obvious tactic is to provide teams with accessible multisource feedback tools

that allow individuals to examine self-other discrepancies within their teams and to adjust their behavior accordingly. Multisource feedback systems are ubiquitous in organizations, and most instruments reveal levels of self-other agreement. From a practical standpoint then, it appears that the infrastructure is already in place to facilitate self-awareness in teams. More difficult, however, is that simply revealing self-other discrepancies may not be enough to improve performance (Sitzmann & Johnson, 2012). Smither, London, and Reilly (2005) demonstrated that a complex web of factors are important to motivating improvement following multisource feedback, including the perceived need for change, goal-regulated behavior, and a positive feedback orientation. Perhaps more difficult, studies of the Dunning-Kruger effect suggest that low performers are more likely to reject self-other discrepancies and therefore be even less inclined to improve. Here, Sheldon, Dunning, and Ames (2014) argue that making feedback productive requires interventions to gain individual commitment to using the feedback prior to receiving the feedback itself.

At the team level, establishing commitment to using peer feedback as a “high-quality performance strategy” to close self-awareness gaps could be accomplished through the development of a team charter (Mathieu & Rapp, 2009). Through team charter interventions, teams can establish performance norms and processes a priori for dealing with perceived unmet expectations and contribution lapses. Thus, whatever intervention is chosen, it is important to recognize that reactive attempts to intercede in teams to reduce the propensity of individuals to overrate is not likely a fruitful use of resources. Decades of scholarship suggest that this natural tendency is ubiquitous, and even when individuals are given incentives and feedback to make accurate self-ratings, their inclinations to overrate persist. Therefore, resources to improve self-awareness might be better spent in training that helps people align personal goals with the utility of the feedback itself (Ashford, 1986) in a preventative or preemptive manner. Along these lines, we caution practitioners who may equate our use of the term *self-awareness in teams* with *individual self-knowledge*. Popular interventions often rely on individual assessments (e.g., Myers-Briggs Type Indicator) to help teams establish self-awareness. Our study suggests that, although well intentioned, these types of interventions are likely to fall well short on improving team functioning, primarily because such assessments are designed to provide introspective self-knowledge, not an awareness of how *others* see one’s contributions to the team.

In conclusion, our study demonstrates that aggregate levels of self-awareness in teams hold important consequences for team functioning and performance. Teams composed of less percipient members with regard to their individual-level contributions showed decrements in team-level functioning, including lower coordination and cohesion and higher conflict. Furthermore, the effects of aggregate self-awareness were important over and above the amount of individual-level contributions made to the team. Analyses also showed overrating to be a particularly problematic form of self-awareness discrepancy. It thus appears that self-awareness in teams is an important and useful concept to consider when diagnosing team effectiveness.

Notes

1. As an illustration, searching Google Scholar with the terms *self-awareness* and *teams* returns >64,000 results. In this expansive set of results, we could not locate any direct empirical examinations of the effects of team

members' self-awareness about their individual contributions to the team on team-level functioning and performance. As we discuss later, this is the focus of our theorizing and empirical examination.

2. It is important to acknowledge the alternative possibility that others' ratings of the target individual may be inaccurate as well. It is our view that, although certainly possible, this explanation is less plausible given the higher level of convergence observed among various other rating sources (e.g., peer-supervisor [$p = .62$]), as contrasted with self-other comparisons (e.g., self-supervisor [$p = .35$], self-peer [$p = .36$]; Harris & Schaubroeck, 1988). In addition, opportunities for direct observation of performance in a team context are likely to be increased relative to more isolated performance contexts, further speaking to the potential quality of others' ratings in the current study. With regard to self-awareness in particular, Ostroff et al. (2004: 333) noted, "Theorists have clearly made the point that even if others' ratings are not objective or accurate, it is important for individuals to understand how they are perceived by others in order to navigate the political realities in organizations."

ORCID iD

Erich C. Dierdorff <https://orcid.org/0000-0001-8929-7653>

References

- Ashford, S. J. 1986. Feedback-seeking in individual adaptation: A resource perspective. *Academy of Management Journal*, 29: 465-487.
- Atwater, L. E., & Yammarino, F. J. 1992. Does self-other agreement on leadership perceptions moderate the validity of leadership and performance predictions? *Personnel Psychology*, 45: 141-164.
- Barrick, M. R., Stewart, G. L., Neubert, M. J., & Mount, M. K. 1998. Relating member ability and personality to work-team processes and team effectiveness. *Journal of Applied Psychology*, 83: 377-391.
- Baumeister, R. F., & Leary, M. R. 1995. The need to belong: Desire for interpersonal attachment as a fundamental human motivation. *Psychological Bulletin*, 117: 497-529.
- Beal, D. J., Cohen, R. R., Burke, M. J., & McLendon, C. L. 2003. Cohesion and performance in groups: A meta-analytic clarification of construct relations. *Journal of Applied Psychology*, 88: 989-1004.
- Bell, S. T. 2007. Deep-level composition variables as predictors of team performance: A meta-analysis. *Journal of Applied Psychology*, 92: 595-615.
- Bieri, J. 1955. Cognitive complexity-simplicity and predictive behavior. *Journal of Abnormal and Social Psychology*, 51: 263-268.
- Bliese, P. D. 2000. Within-group agreement, non-independence, and reliability: Implications for data aggregation and analysis. In K. J. Klein & S. W. J. Kozlowski (Eds.), *Multilevel theory, research, and methods in organizations: Foundations, extensions, and new directions*: 349-381. San Francisco: Jossey-Bass.
- Buehler, R., Griffin, D., & Ross, M. 2002. Inside the planning fallacy: The causes and consequences of optimistic time predictions. In T. Gilovich, D. Griffin, & D. Kahneman (Eds.), *Heuristics and biases: The psychology of intuitive judgment*: 250-270. Cambridge, England: Cambridge University Press.
- Cannon-Bowers, J. A., Tannenbaum, S. I., Salas, E., & Volpe, C. E. 1995. Defining competencies and establishing team training requirements. In R. A. Guzzo & E. Salas (Eds.), *Team effectiveness and decision making in organizations*: 333-380. San Francisco: Jossey-Bass.
- Capsim Management Simulations. 2014. *TeamMATE Technical Synopsis*. Chicago, IL: Author.
- Carron, A. V., & Brawley, L. R. 2012. Cohesion: Conceptual and measurement issues. *Small Group Research*, 43: 726-743.
- 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.
- Chiochio, F., & Essiembre, H. 2009. Cohesion and performance: A meta-analytic review of disparities between project teams, production teams, and service teams. *Small Group Research*, 40: 382-420.
- Church, A. H. 1997. Managerial self-awareness in high-performing individuals in organizations. *Journal of Applied Psychology*, 82: 281-292.
- Colquitt, J. A., LePine, J. A., Piccolo, R. F., Zapata, C. P., & Rich, B. L. 2012. Explaining the justice-performance relationship: Trust as exchange deepener or trust as uncertainty reducer? *Journal of Applied Psychology*, 97: 1-15.

- Colvin, C. R., Block, J., & Funder, D. C. 1995. Overly positive self-evaluations and personality: Negative implications for mental health. *Journal of Personality and Social Psychology*, 68: 1152-1162.
- Connelly, B. S., & Ones, D. S. 2010. Another perspective on personality: Meta-analytic integration of observers' accuracy and predictive validity. *Psychological Bulletin*, 136: 1092-1122.
- Conway, J. M., & Huffcutt, A. I. 1997. Psychometric properties of multi-source performance ratings: A meta-analysis of subordinate, supervisor, peer, and self-ratings. *Human Performance*, 10: 331-360.
- Cropanzano, R., & Mitchell, M. S. 2005. Social exchange theory: An interdisciplinary review. *Journal of Management*, 31: 874-900.
- DeChurch, L. A., & Mesmer-Magnus, J. R. 2010. The cognitive underpinnings of effective teamwork: A meta-analysis. *Journal of Applied Psychology*, 95: 32-53.
- DeChurch, L. A., Mesmer-Magnus, J. R., & Doty, D. 2013. Moving beyond relationship and task conflict: Toward a process-state perspective. *Journal of Applied Psychology*, 98: 559.
- De Dreu, C. K. 2006. When too little or too much hurts: Evidence for a curvilinear relationship between task conflict and innovation in teams. *Journal of Management*, 32: 83-107.
- De Dreu, C. K. 2008. The virtue and vice of workplace conflict: Food for (pessimistic) thought. *Journal of Organizational Behavior*, 29: 5-18.
- De Dreu, C. K., & Weingart, L. R. 2003. Task versus relationship conflict, team performance, and team member satisfaction: A meta-analysis. *Journal of Applied Psychology*, 88: 741-749.
- de Wit, F. R. C., Greer, L. L., & Jehn, K. A. 2012. The paradox of intragroup conflict: A meta-analysis. *Journal of Applied Psychology*, 97: 360-390.
- Dierdorff, E. C., Bell, S. T., & Belohlav, J. A. 2011. The power of "we": Effects of psychological collectivism on team performance over time. *Journal of Applied Psychology*, 96: 247-262.
- Dirks, K. T., & Ferrin, D. L. 2002. Trust in leadership: Meta-analytic findings and implications for research and practice. *Journal of Applied Psychology*, 87: 611-628.
- Dunning, D. 2012. *Self-insight: Roadblocks and detours on the path to knowing thyself*. New York: Psychology Press.
- Dunning, D., Heath, C., & Suls, J. 2004. Flawed self-assessment: Implications for health, education, and the workplace. *Psychological Science in the Public Interest*, 5: 71-106.
- Edwards, J. R. 1994. The study of congruence in organizational behavior research: Critique and a proposed alternative. *Organizational Behavior and Human Decision Processes*, 58: 51-100.
- Edwards, J. R., & Parry, M. E. 1993. On the use of polynomial regression equations as an alternative to difference scores in organizational research. *Academy of Management Journal*, 36: 1577-1613.
- Edwards, J. R., & van Harrison, R. 1993. Job demands and worker health: Three-dimensional reexamination of the relationship between person-environment fit and strain. *Journal of Applied Psychology*, 78: 628-648.
- Ehrlinger, J., & Dunning, D. 2003. How chronic self-views influence (and potentially mislead) estimates of performance. *Journal of Personality and Social Psychology*, 84: 5-17.
- Ehrlinger, J., Johnson, K., Banner, M., Dunning, D., & Kruger, J. 2008. Why the unskilled are unaware: Further explorations of (absent) self-insight among the incompetent. *Organizational Behavior and Human Decision Processes*, 105: 98-121.
- Ellington, J. K., & Dierdorff, E. C. 2014. Individual learning in team training: Self-regulation and team context effects. *Small Group Research*, 45: 37-67.
- Ellis, A. P., Hollenbeck, J. R., Ilgen, D. R., Porter, C. O., West, B. J., & Moon, H. 2003. Team learning: Collectively connecting the dots. *Journal of Applied Psychology*, 88: 821-835.
- Entin, E. E., & Serfaty, D. 1999. Adaptive team coordination. *Human Factors*, 41: 312-325.
- Festinger, L. 1954. A theory of social comparison processes. *Human Relations*, 7: 117-140.
- Fisher, D. M., Bell, S. T., Dierdorff, E. C., & Belohlav, J. A. 2012. Facet personality and surface-level diversity as team mental model antecedents: Implications for implicit coordination. *Journal of Applied Psychology*, 97: 825-841.
- Fleenor, J. W., Smither, J. W., Atwater, L. E., Braddy, P. W., & Sturm, R. E. 2010. Self-other rating agreement in leadership: A review. *Leadership Quarterly*, 21: 1005-1034.
- Fletcher, C. 1997. Self-awareness—A neglected attribute in selection and assessment. *International Journal of Selection and Assessment*, 5: 183-187.
- Galinsky, A. D., Ku, G., & Wang, C. S. 2005. Perspective-taking and self-other overlap: Fostering social bonds and facilitating social coordination. *Group Processes & Intergroup Relations*, 8: 109-124.

- Gordon, R. A. 1996. Impact of ingratiation on judgments and evaluations: A meta-analytic investigation. *Journal of Personality and Social Psychology*, 71: 54-70.
- Greer, L. L., Caruso, H. M., & Jehn, K. A. 2011. The bigger they are, the harder they fall: Linking team power, team conflict, and performance. *Organizational Behavior and Human Decision Processes*, 116: 116-128.
- Harris, M. M., & Schaubroeck, J. 1988. A meta-analysis of self-supervisor, self-peer, and peer-supervisor ratings. *Personnel Psychology*, 41: 43-62.
- Heidemeier, H., & Moser, K. 2009. Self-other agreement in job performance ratings: A meta-analytic test of a process model. *Journal of Applied Psychology*, 94: 353-370.
- Heise, D. R. 1972. Employing nominal variables, induced variables, and block variables in path analysis. *Sociological Methods & Research*, 1: 147-173.
- Higgins, C. A., Judge, T. A., & Ferris, G. R. 2003. Influence tactics and work outcomes: A meta-analysis. *Journal of Organizational Behavior*, 24: 89-106.
- Hollenbeck, J. R., Ilgen, D. R., Sego, D. J., Hedlund, J., Major, D. A., & Philips, J. 1995. Multilevel theory of team decision making: Decision performance in teams incorporating distributed expertise. *Journal of Applied Psychology*, 80: 292-316.
- Jehn, K. A. 1995. A multimethod examination of the benefits and detriments of intragroup conflict. *Administrative Science Quarterly*, 40: 256-282.
- Jordan, A. H., & Audia, P. G. 2012. Self-enhancement and learning from performance feedback. *Academy of Management Review*, 37: 211-231.
- Jordan, P. J., & Ashkanasy, N. M. 2006. Emotional intelligence, emotional self-awareness, and team effectiveness. In V. U. Druskat, G. Mount, & F. Sala (Eds.), *Linking emotional intelligence and performance at work: Current research evidence with individuals and groups*: 45-163. Mahwah, NJ: Erlbaum.
- Joseph, D. L., & Newman, D. A. 2010. Emotional intelligence: An integrative meta-analysis and cascading model. *Journal of Applied Psychology*, 95: 54-78.
- Kaplan, R. S., & Norton, D. P. 1996. *The balanced scorecard: Translating strategy into action*. Boston, MA: Harvard Business School Press.
- Karau, S. J., & Williams, K. D. 1993. Social loafing: A meta-analytic review and theoretical integration. *Journal of Personality and Social Psychology*, 65: 681-706.
- Klein, H. J. 1989. An integrated control theory model of work motivation. *Academy of Management Review*, 14: 150-172.
- Klein, K. J., & Kozlowski, S. W. 2000. From micro to meso: Critical steps in conceptualizing and conducting multilevel research. *Organizational Research Methods*, 3: 211-236.
- Klimoski, R., & Mohammed, S. 1994. Team mental model: Construct or metaphor? *Journal of Management*, 20: 403-437.
- Korsgaard, M. A., Meglino, B. M., & Lester, S. W. 2004. The effect of other orientation on self-supervisor rating agreement. *Journal of Organizational Behavior*, 25: 873-891.
- Kozlowski, S. W. J., & Chao, G. T. 2012. The dynamics of emergence: Cognition and cohesion in work teams. *Managerial and Decision Economics*, 33: 335-354.
- Kozlowski, S. W. J., Gully, S. M., Nason, E. R., & Smith, E. M. 1999. Developing adaptive teams: A theory of compilation and performance across levels and time. In D. R. Ilgen & E. D. Pulakos (Eds.), *The changing nature of work and performance: Implications for staffing personnel actions and development*: 240-292. San Francisco: Jossey-Bass.
- Kunda, Z. 1990. The case for motivated reasoning. *Psychological Bulletin*, 108: 480-498.
- LePine, J. A., Piccolo, R. F., Jackson, C. L., Mathieu, J. E., & Saul, J. R. 2008. A meta-analysis of teamwork processes: Tests of a multidimensional model and relationships with team effectiveness criteria. *Personnel Psychology*, 61: 273-307.
- Liden, R. C., Wayne, S. J., Jaworski, R. A., & Bennett, N. 2004. Social loafing: A field investigation. *Journal of Management*, 30: 285-304.
- Marks, M. A., Mathieu, J. E., & Zaccaro, S. J. 2001. A temporally based framework and taxonomy of team process. *Academy of Management Review*, 26: 356-376.
- Marks, M. A., Sabella, M. J., Burke, C. S., & Zaccaro, S. J. 2002. The impact of cross-training on team effectiveness. *Journal of Applied Psychology*, 87: 3-13.
- Mathieu, J. E., Heffner, T. S., Goodwin, G. F., Salas, E., & Cannon-Bowers, J. A. 2000. The influence of shared mental models on team process and performance. *Journal of Applied Psychology*, 85: 273-283.

- Mathieu, J. E., Maynard, M. T., Rapp, T., & Gilson, L. 2008. Team effectiveness 1997–2007: A review of recent advancements and a glimpse into the future. *Journal of Management*, 34: 410–476.
- Mathieu, J. E., & Rapp, T. L. 2009. Laying the foundation for successful team performance trajectories: The roles of team charters and performance strategies. *Journal of Applied Psychology*, 94: 90–103.
- Mathieu, J. E., Tannenbaum, S. I., Donsbach, J. S., & Alliger, G. M. 2014. A review and integration of team composition models: Moving toward a dynamic and temporal framework. *Journal of Management*, 40: 130–160.
- McGrath, J. E. 1964. *Social psychology: A brief introduction*. New York: Holt, Rinehart and Winston.
- Mezulis, A. H., Abramson, L. Y., Hyde, J. S., & Hankin, B. L. 2004. Is there a universal positivity bias in attributions? A meta-analytic review of individual, developmental, and cultural differences in the self-serving attributional bias. *Psychological Bulletin*, 130: 711–747.
- Mohammed, S., & Angell, L. C. 2004. Surface-and deep-level diversity in workgroups: Examining the moderating effects of team orientation and team process on relationship conflict. *Journal of Organizational Behavior*, 25: 1015–1039.
- Mohammed, S., Ferzandi, L., & Hamilton, K. 2010. Metaphor no more: A 15-year review of the team mental model construct. *Journal of Management*, 36: 876–910.
- Nguyen, N. T., Seers, A., & Hartman, N. S. 2008. Putting a good face on impression management: Team citizenship and team satisfaction. *Journal of Behavioral and Applied Management*, 9: 148–168.
- Ostroff, C., Atwater, L. E., & Feinberg, B. J. 2004. Understanding self-other agreement: A look at rater and ratee characteristics, context, and outcomes. *Personnel Psychology*, 57: 333–375.
- Park, G., Spitzmuller, M., & DeShon, R. P. 2013. Advancing our understanding of team motivation: Integrating conceptual approaches and content areas. *Journal of Management*, 39: 1339–1379.
- Pronin, E., Gilovich, T., & Ross, L. 2004. Objectivity in the eye of the beholder: Divergent perceptions of bias in self versus others. *Psychological Review*, 111: 781–799.
- Rentsch, J. R., & Hall, R. J. 1994. Members of great teams think alike: A model of team effectiveness and schema similarity among team members. In M. M. Beyerlein & D. A. Johnson (Eds.), *Advances in interdisciplinary studies of work teams: Theories of self-managing work teams* (Vol. 1): 223–261. Greenwich, CT: JAI Press.
- Rentsch, J. R., & Klimoski, R. J. 2001. Why do “great minds” think alike? Antecedents of team member schema agreement. *Journal of Organizational Behavior*, 22: 107–120.
- Rentsch, J. R., Small, E. E., & Hanges, P. J. 2008. Cognitions in organizations and teams: What is the meaning of cognitive similarity? In B. Smith (Ed.), *The people make the place: Exploring dynamic linkages between individuals and organizations*: 127–155. New York: Psychology Press.
- Rentsch, J. R., & Woehr, D. J. 2004. Quantifying congruence in cognition: Social relations modeling and team member schema similarity. In E. Salas & S. Fiore (Eds.), *Team cognition: Understanding the factors that drive process and performance*: 11–32. Washington, DC: American Psychological Association.
- Rentsch, J. R., & Zenlo, J. 2003. The role of cognition in managing conflict to maximize team effectiveness: A team member schema similarity approach. In M. West, K. Smith, & D. Tjosvold (Eds.), *International handbook of organization and cooperative teamworking*: 131–150. West Sussex, England: Wiley.
- Richardson, D. R., Hammock, G. S., Smith, S. M., Gardner, W., & Signo, M. 1994. Empathy as a cognitive inhibitor of interpersonal aggression. *Aggressive Behavior*, 20: 275–289.
- Rico, R., Sánchez-Manzanares, M., Gil, F., & Gibson, C. 2008. Team implicit coordination processes: A team knowledge-based approach. *Academy of Management Review*, 33: 163–184.
- Robinson, R. J., Keltner, D., Ward, A., & Ross, L. 1995. Actual versus assumed differences in construal: “Naïve realism” in intergroup perception and conflict. *Journal of Personality and Social Psychology*, 68: 404–417.
- Rousseau, V., Aube, C., & Savoie, A. 2006. Teamwork behaviors: A review and an integration of frameworks. *Small Group Research*, 37: 540–570.
- Saavedra, R., & Kwun, S. K. 1993. Peer evaluation in self-managing work groups. *Journal of Applied Psychology*, 78: 450–462.
- Salas, E., Sims, D. E., & Burke, C. S. 2005. Is there a “Big Five” in teamwork? *Small Group Research*, 36: 555–599.
- Sedikides, C., Herbst, K. C., Hardin, D. P., & Dardis, G. J. 2002. Accountability as a deterrent to self-enhancement: The search for mechanisms. *Journal of Personality and Social Psychology*, 83: 592–605.
- Shea, G. P., & Guzzo, R. A. 1989. Groups as human resources. In G. R. Ferris & K. M. Rowlands (Eds.), *Research in personnel and human resources management* (Vol. 5): 323–356. Greenwich, CT: JAI.
- Sheldon, O. J., Dunning, D., & Ames, D. R. 2014. Emotionally unskilled, unaware, and uninterested in learning more: Reactions to feedback about deficits in emotional intelligence. *Journal of Applied Psychology*, 99: 125–137.

- Sitzmann, T., & Johnson, S. K. 2012. The best laid plans: Examining the conditions under which a planning intervention improves learning and reduces attrition. *Journal of Applied Psychology*, 97: 967-981.
- Smither, J. W., London, M., & Reilly, R. R. 2005. Does performance improve following multisource feedback? A theoretical model, meta-analysis, and review of empirical findings. *Personnel Psychology*, 58: 33-66.
- Spreitzer, G. M., Cohen, S. G., & Ledford, G. E. 1999. Developing effective self-managing work teams in service organizations. *Group & Organization Management*, 24: 340-366.
- Stevens, M. J., & Campion, M. A. 1994. The knowledge, skill, and ability requirements for teamwork: Implications for human resource management. *Journal of Management*, 20: 503-530.
- Tannenbaum, S. I., Mathieu, J. E., Salas, E., & Cohen, D. 2012. Teams are changing: Are research and practice evolving fast enough? *Industrial and Organizational Psychology: Perspectives on Science and Practice*, 5: 2-24.
- Taylor, S. E., & Brown, J. D. 1988. Illusion and well-being: A social psychological perspective on mental health. *Psychological Bulletin*, 103: 193-210.
- Tesluk, P., Mathieu, J. E., Zaccaro, S. J., & Marks, M. 1997. Task and aggregation issues in the analysis and assessment of team performance. In M. T. Brannick, E. Salas, & C. Prince (Eds.), *Team performance assessment and measurement: Theory, methods, and applications*: 197-224. Mahwah, NJ: Erlbaum.
- von Hippel, W., & Trivers, R. 2011. The evolution and psychology of self-deception. *Behavioral and Brain Sciences*, 34: 1-56.
- Wageman, R. 1995. Interdependence and group effectiveness. *Administrative Science Quarterly*, 40: 145-180.
- Yammarino, F. J., & Atwater, L. E. 1997. Do managers see themselves as others see them? Implications of self-other rating agreement for human resources management. *Organizational Dynamics*, 25: 35-44.
- Zell, E., & Krizan, Z. 2014. Do people have insight into their abilities? A metasynthesis. *Perspectives on Psychological Science*, 9: 111-125.