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### Advancing our Understanding of Team Motivation: Integrating Conceptual Approaches and Content Areas

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# **Advancing Our Understanding of Team Motivation: Integrating Conceptual Approaches and Content Areas**

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## **Abstract**

Although research on team motivation has been one of the fastest growing research domains in organizational science, progress in this domain has been hampered by a lack of integrative reviews. Thus, we develop a theoretical framework in this article to summarize and discuss different conceptual approaches to team motivation for the following six content areas: team design, team needs, team goals, team self-regulation, team efficacy, and team affect. Our framework organizes previous research according to two dimensions. First, we assess the degree of interdependence between team members' motivational states, differentiating between models that conceptualize team motivation as functionally equivalent to individual level motivation and models that conceptualize team motivation as a truly collective phenomenon. Second, we assess the extent to which research conceptualizes team motivation as a dynamic phenomenon that evolves over time, with static models of team motivation and dynamic models of team motivation demarcating the opposite ends of this continuum. With this framework, we show that previous research on team motivation has overemphasized conceptual similarities between motivation constructs at the individual and team levels of analysis. We address this shortcoming by developing a theory of interdependent regulatory dynamics. This theory emphasizes the interdependent and dynamic nature of team motivation. It depicts the processes in which team members decide how to allocate their efforts and resources between individual goals and team goals, and it identifies the multiple pathways through which teams coordinate and regulate their collective efforts over time.

**Keywords:** team motivation, team goals, team needs, team design, team efficacy, team regulation, team affect

One of the fastest growing domains within the field of motivation has been research on team motivation (Chen, Kanfer, DeShon, Mathieu, & Kozlowski, 2009; Grant & Shin, 2012). Team motivation is the coordination of the intensity and duration of collective effort directed at a shared team goal through the functioning of interdependent regulatory feedback loops. The growth in research on team motivation is not surprising considering the widespread use of teams in organizations and the rich literature on work teams (Hollenbeck, Beersma, & Schouten, 2012; Mathieu, Maynard, Rapp, & Gibson, 2008). The widespread use of teams in organizations also coincides with recent advances in multilevel theorizing and modeling that have renewed scholars' interest in the organization sciences in multilevel phenomena, investigating the generalizability of theories across levels (Kozlowski & Klein, 2000; Wertheimer, 1923).

One potential challenge associated with the growing body of research on team motivation is the few integrative frameworks and reviews summarizing this diverse body of research. This is unfortunate because such an integrating framework is needed to summarize the progress that has been made in research on team motivation and to identify gaps in the literature, thereby helping to develop a research agenda for the future. Thus, the goal of this review is to develop an integrative framework of team motivation that allows us to summarize past research on team motivation and that points to promising areas of future research.

Even though existing reviews of the team motivation literature have advanced our understanding of team motivation, a number of important questions remain unanswered. Sweezy, Meltzer, and Salas (1994) defined team motivation as consisting of the social aspects of teams (e.g., work performance norms and interpersonal skills), thereby neglecting the complex and multilevel nature of team motivation. Second, existing reviews on team motivation largely focused on individual work motivation in teams (e.g., Ilgen & Sheppard, 2001), which does not conceptualize motivation as a team-level phenomenon. Third, Chen and Gogus (2008) focused primarily on efficacy and goal commitments and did not discuss other important team motivation topics such as needs theories or affect. Finally, more recent reviews on team motivation have largely focused on "parallel, or functionally similar, constructs and relationships that underlie motivation processes at both the individual and team levels" (Chen & Kanfer, 2006: 225). This approach has advanced our understanding of important similarities between motivational constructs at different levels. As Chen, Mathieu, and Bliese (2004) have pointed out, however, multilevel research also has to consider the possibility of changes in construct meaning, psychometric properties, construct variability, and construct function across levels of analysis. Thus, what is needed is an integrative framework for the field of team motivation that discusses both conceptual similarities and differences that exist between the individual and team levels.

Our review and integration of extant research on team motivation contributes to the growing field of team motivation in at least four meaningful ways. First, we believe that this is the first integrative review of the team motivation literature that incorporates all major team motivation theories and that addresses both conceptual similarities and differences between motivation constructs at the individual and team levels. By discussing the past, present, and future of team motivation research, we show how team motivation research has evolved and continues to evolve over time. Second, our conceptual framework organized by six content domains and two conceptual dimensions shows which topics and approaches to studying team motivation have attracted the greatest attention among researchers in the past decade. Third, researchers can use this framework to locate a specific

research question and make informed decisions in their theorizing, measurement, and analysis. By discussing both conceptual similarities and differences between motivation research on the individual and team levels of analysis, we provide an in-depth analysis of the functional relationships between motivational constructs at different levels of analysis (Chan, 1998; Kozlowski & Klein, 2000). Finally, we develop a research agenda that can guide future research on team motivation.

The first section of this article introduces what we view as the six most important content areas of team motivation. We then provide a comprehensive review of the past decade of research on team motivation within these six content areas. After assessing the state of the team motivation literature, we then develop a model of interdependent regulatory dynamics that explains the processes in which team members' collaborative effort are regulated through their pursuit of individual and team goals. We conclude with an outlook for the future of the field of team motivation.

### **Overview of General Content Area**

We identified six content areas for our review: team design, team needs, team goals, team self-regulation, team efficacy, and team affect. Our rationale for including these areas was guided by two criteria. First, each of these content areas has a long tradition of research on the individual level (Latham & Pinder, 2005; Mitchell & Daniels, 2003). Second, we chose to focus on content areas that have spurred sufficient theorizing to create a coherent and integrated body of team motivation research. Thus, we focused only on those content areas in which a substantial body of research has emerged, conceptualizing motivation as a multilevel, complex, and dynamic phenomenon or where we see significant potential for research to advance in this direction. Motivation research has already advanced our understanding of the motivational implications of team design, team or collective efficacy, and team goals. In addition to these already well-established group-level motivation topics, we identify team needs, self-regulation in teams, and team affect as fast-growing content areas justifying inclusion in this review article. A brief summary of research in the different content areas can be found in Table 1.

**Table 1**  
**The State of the Team Motivation Literature by Content Area**

	The Present	The Future
Team design	<ul style="list-style-type: none"> <li>Integrating social aspects into traditional work design research (e.g., Work Design Questionnaire; Morgeson &amp; Humphrey, 2008)</li> <li>Changes in team design over time (e.g., structural contingency theory; Moon et al., 2004)</li> </ul>	<ul style="list-style-type: none"> <li>Team design as an emergent social property in teams</li> <li>Consequences of divergent perceptions of team design features on team functioning and performance</li> </ul>
Team needs	<ul style="list-style-type: none"> <li>Adopting social psychological needs theories to team research (e.g., optimal distinctiveness theory; Brewer, 1991)</li> </ul>	<ul style="list-style-type: none"> <li>Investigating convergence of needs in teams and the nature of team needs</li> <li>Team needs satisfaction as a dynamic and social process</li> <li>Emergent team goals over time</li> </ul>
Team goals	<ul style="list-style-type: none"> <li>Dynamic interaction between different team goals (Porter et al., 2010)</li> <li>Top-down and bottom-up processes involving team learning goals (Park &amp; DeShon, 2010)</li> </ul>	<ul style="list-style-type: none"> <li>Multiple goal pursuit in teams</li> </ul>
Team self-regulation	<ul style="list-style-type: none"> <li>Adopting learning aids to team training (e.g., team reflexivity—Gurtner et al., 2007; team planning—Mehta et al., 2009)</li> <li>Effect of feedback at different levels (DeShon et al., 2004)</li> </ul>	<ul style="list-style-type: none"> <li>Computational modeling of resource allocation decisions at different levels</li> <li>Team implementation intention</li> </ul>
Team efficacy	<ul style="list-style-type: none"> <li>Nomological network of team efficacy (Gully et al., 2002)</li> <li>Changes in team efficacy and team performance dynamics over time (Goncalo, Polman, &amp; Maslach, 2010)</li> </ul>	<ul style="list-style-type: none"> <li>Configuration of team member efficacy</li> <li>Dynamic relationships of team efficacy with team goals and affects</li> </ul>
Team affect	<ul style="list-style-type: none"> <li>Social influences on affective states (Watson, 2000)</li> <li>Affective linkage among team members (Ilies, Wagner, &amp; Morgeson, 2007)</li> </ul>	<ul style="list-style-type: none"> <li>Interactions between team level trait and state affect</li> <li>Collective emotion recognition</li> </ul>

Table 1: The State of the Team Motivation Literature by Content Area

For our review article, we searched the top 9 journals in the field of organizational behavior (Academy of Management Journal, Academy of Management Review, Administrative Science Quarterly, Journal of Management, Organization Science, Journal of Applied Psychology, Personnel Psychology, Organizational Behavior and Human Decision Processes, and Journal of Organizational Behavior) for any articles on teams in general. During our first screening process, we read the abstracts of all the articles and identified those relevant to the field of team motivation.

We classified the articles according to their conceptual approach to studying team motivation. We used two conceptual dimensions to classify the articles. In the first conceptual dimension, we assessed the extent to which team motivation was defined as a truly collective phenomenon. On one end of this continuum, we find articles that conceptualize team motivation as simply the aggregate of individual motivation. On the other end of this continuum, we find articles that treat team motivation as a truly collective phenomenon that can be understood only by recognizing the interdependent nature of motivational states in teams. In the second conceptual dimension, we assessed the extent to which team motivation research conceptualized team motivation as a dynamic phenomenon. Research that conceptualizes team motivation as a dynamic construct

explicitly considers the dynamic processes through which team motivational states emerge in teams (e.g., Wageman & Gordon, 2005). Conversely, research that conceptualizes team motivation as a static phenomenon ignores such dynamic processes, either by conceptualizing team motivation as a static property of teams or by taking a snapshot of team motivation at one point of time.

## **Introducing Six Content Areas of Team Motivation**

### **Team Design**

Job design generically refers to “the content and structure of jobs that employees perform” (Oldham, 1996: 33). The extant research on job design constitutes one of the early foundations of motivation research (Hackman & Oldham, 1976; Roethlisberger & Dickson, 1939; Taylor, 1911). The job characteristics model (Hackman & Oldham, 1976), which proposed that there are five core job characteristics that describe the extent to which a job is motivating, constitutes one of the most influential models of work motivation. With teams becoming the most commonly used form of structuring work, the study of team design has enjoyed increasing popularity. Morgeson and Humphrey (2008: 46) provided a useful definition of team design, describing team design as a “specification of team membership: definition and structure of a team’s tasks, goals, and members’ roles; and the creation of organizational support for the team and link to the broader organizational context.” This definition spans three levels, referring to the individual team member, the interdependence that exists between team members, and the embeddedness of the team in the larger organization.

Despite the wealth of research on team design, there is surprisingly little research discussing how the meaning of job design variables is affected as we move from the individual to the team level of analysis (Hollenbeck & Spitzmuller, 2012). In our review, we focus on two aspects of team design that have received the greatest attention among team design researchers: horizontal interdependence (i.e., task interdependence) and vertical interdependence (i.e., team empowerment; Hollenbeck & Spitzmuller, 2012; Langfred, 2000; Moon et al., 2004).

### **Team Needs**

Kanfer (1991) and Latham and Pinder (2005) theorized that needs should best be viewed as internal tensions that trigger cognitive processes that influence the directionality, intensity, and persistence of our behavior. Similar to research on job design, research on needs dates back to the beginnings of research on motivation, including Maslow’s hierarchy of needs (Maslow, 1943) and Alderfer’s ERG theory (Alderfer, 1969). These early needs theories have been criticized with much vigor. This criticism has certainly helped address the limitations of these early needs theories, but has not offered much guidance for subsequent theorizing on needs. Compared to the other five content domains that we discuss in this article, research on needs has enjoyed the least popularity among motivation researchers over the past 30 years.

Recent developments indicate a possible resurgence in interest on needs theories. Research on needs, however, has largely restricted itself to the individual level of analysis (Latham & Pinder, 2005). There is little research that has examined the nature of team needs and the motivating force of team needs. Given the scarcity of useful definitions, we propose a definition of team needs as

internal tensions that are shared by team members and that determine the direction, intensity, and persistence of team behavior over time.

The lack of research on team needs is surprising because seminal needs theories all posit the existence of social needs, such as the need for relatedness or belonging (Alderfer, 1969; Maslow, 1943). Also, needs in groups have received a great deal of attention among social psychologists. In her optimal distinctiveness theory, Brewer (1991) argued that individuals in teams experience a simultaneous need for belongingness and distinctiveness and that the satisfaction of these two needs would be associated with optimal psychological functioning.

### **Team Goals**

Goals are defined as “internal representations of desired states where states are broadly construed as outcomes, events, or processes” (Austin & Vancouver, 1996: 338). Goals act as a powerful motivational force that directs individuals’ attention, mobilizes effort expenditure, and promotes the development of task-relevant strategies (Locke, Shaw, Saari, & Latham, 1981). Not only do individuals aspire to attain their individual goals for personal gain, they also desire to attain the objectives of collectives such as groups and teams (Lewis, 1944; Zander, 1971). Zander (1996) discussed group goals as group-level aspirations shared by its members.

Early studies on team goals focused on group goal setting. Locke and Latham (1990) showed that groups also perform better when they have specific and challenging goals than when they have vague and easy goals. Also, while groups tend to be slightly more ambitious in choosing their goals, both groups and individuals tend to raise their aspirations after a success, while aspirations reduce after a failure (Zander, 1996). Also, studies examined goal interdependence among group members and discussed the effect of cooperative versus competitive goal interdependences on team functioning (Deutsch, 1949, 1962).

During the past decade, research on team goals has moved away from an exclusive focus on team goal setting and has paid increasing attention to team goal orientation. We believe this trend reflects the ever-increasing pressure for teams to meet both learning and performance demands of their environment. Although goals and goal orientations are similar concepts, goals are more relevant to level of motivation such as the direction, persistence, and effort exerted by teams, while goal orientations are more relevant to different paths that teams adopt in their goal pursuits. Teams with high levels of learning goal orientation have a shared focus aiming to develop team competence by seeking out challenges. Teams with high levels of performance goal orientation have a shared focus on establishing a normative excellence in performance. The current review of team goal includes studies on both team goal and team goal orientation.

### **Team Regulation**

Broadly defined, self-regulation refers to a process that guides individuals’ allocation of time and effort that are directed toward reducing goal-performance discrepancies (Kanfer, 1990). Self-regulation studies focus on the multiple demands that individuals are dealing with in their pursuit of goals that are organized in a hierarchy. Team regulation refers to the dynamic processes through which “team members share their understanding of their task and environment, interpret their team feedback in comparison to their stated objectives, and enact coordinated effort toward their team

goal” (Kozlowski, Gully, Salas, & Cannon-Bowers, 1996: 276). Self-regulation theories have been adopted to the team level, addressing team regulation processes in response to team feedback (Peterson & Behfar, 2003), team metacognition (Gurtner, Tschan, Semmer, & Nagele, 2007), and the role of team regulatory focus for team functioning and performance (Levine, Higgins, & Choi, 2000).

Recent studies of team regulation have shown an increased interest in social implications of team feedback. Such studies have demonstrated that team feedback influences relational conflict (Peterson & Behfar, 2003), helping behaviors toward team members (Bachrach, Bendoly, & Podsakoff, 2001), and collaboration with other teams (Schwab & Miner, 2008). Team regulation frameworks have also frequently been used to explain the mechanisms that drive team members’ behaviors and their pursuit of multiple goals in teams (DeShon, Kozlowski, Schmidt, Milner, & Wiechmann, 2004). In our review, past research on team regulation is examined, focusing on the effect of team feedback on team functioning and recent multilevel models of team regulation.

### **Team Efficacy**

Extending the concept of individual self-efficacy to the team level, Bandura (1997: 477) argued that team members develop a sense of collective efficacy. He defined collective efficacy as a “shared belief in its conjoint capabilities to organize and execute the courses of action required to produce given level of attainments.” Scholars found that people who have a greater propensity to engage in social activism generally have a high collective efficacy and a belief that they can exert social influence (Bandura, 1982; Forward & Williams, 1970).

Organizational scientists adopted the concept of collective efficacy to teams, terming it team efficacy. Team efficacy is identified as an emergent motivational state of teams, where social interaction dynamics among team members determine the emergence of collective efficacy (Bandura, 1997; Srivastava, Bartol, & Locke, 2006). Early studies of team efficacy focused on replicating findings obtained in studies on individual self-efficacy. Such studies demonstrated that team efficacy predicts team performance even after controlling for past team performance levels, which helped solidify the role of team efficacy as a key team motivational state (Bandura, 1997; Prussia & Kinicki, 1996; Riggs & Knight, 1994).

During the past decade, studies have integrated the effect of team efficacy with different team motivational variables such as task design (Gibson, 1999; Stajkovic, Lee, & Nyberg, 2009), team goals (Knight, Durham, & Locke, 2001), and feedback (DeShon et al., 2004) to better explain the dynamics involving the effect of team efficacy on team performance. Also, multilevel modeling of team efficacy has increased in its popularity (Chen & Bliese, 2002).

### **Team Affect**

Almost 20 years have passed since Mowday and Sutton (1993) argued against an overemphasis on cognition in motivation research, urging researchers to develop integrative theories that consider the important role of affect for work motivation. Kelly and Barsade (2001) noted that the recent renaissance of interest in group research has coincided with a similar renaissance and interest in the field of affect. This research has sought to provide answers to the question of how collective affective experiences in teams shape team motivation. A closer look at Table 1 shows the rich and diverse nature of research on team affect, also referred to as affective tone. This research has



advanced our understanding of how to measure affect on the team level of analysis (Mason & Griffin, 2003; Sanchez-Burks & Huy, 2009) and of how affective tone influences team processes and team outcomes (West, Patera, & Carsten, 2009). Group affect has been conceptualized in a number of different ways (Barsade & Gibson, 2007). George (1995) posited that a group's affective tone represents the homogeneous affective reactions that team members experience at work. Consistent with this idea, more recent research supports the notion of affective linkages between team members and between team leaders and their subordinates (Ilies, Wagner, & Morgeson, 2007; Sy, Cote, & Saavedra, 2005). Others have studied collective affect by focusing on the diversity of affective experiences that are present in a team (Barsade, Ward, Turner, & Sonnenfeld, 2000; van Knippenberg, Kooij-de Bode, & van Ginkel, 2010). A third perspective has adopted a top-down approach in studying collective affect, positing that affective experiences are regulated by group norms that prescribe the appropriateness of particular emotional expressions at work (Barsade & O'Neill, 2004).

### **Developing an Integrative Framework**

To structure our review of the vast team motivation literature in the six content areas of team motivation, we relied on two conceptual dimensions that characterize the degree of complexity ascribed to team motivation. Table 2 illustrates an example of studies in the two dimensions. The first of these two dimensions represents the degree to which team motivation is characterized as a truly collective phenomenon, thereby addressing the social interdependencies that exist in teams. The second dimension represents the degree to which team motivation research addresses the dynamic processes in which team motivation develops over time. We chose to use these two dimensions to develop an integrative framework of team motivation for two reasons. First, the two dimensions provide us with a systems perspective to study motivation in teams and motivation of teams, capturing the top-down and bottom-up processes that create the shared motivational reality in teams. Second, the two conceptual dimensions also feature in recent theoretical models of team behavior and work motivation, thus facilitating a dialogue between our review and previous theoretical accounts of the team and motivation literature (Ilgen, Hollenbeck, Johnson, & Jundt, 2005; Latham & Pinder, 2005).

**Table 2**  
**Integrating Conceptual Approaches and Content Areas—**  
**An Integrative Framework of Team Motivation**

	Team Design	Team Needs	Team Goal	Team Regulation	Team Efficacy	Team Affect
Studies that emphasize the collective character of team motivation	Team processes are more important when task interdependence (e.g., horizontal interdependence) is high (LePine et al., 2008)	Climate of self-determination predicts ownership beliefs in work groups (Wagner, Parker, & Christiansen, 2003)	Multilevel antecedents of team goal setting (e.g., Kleingeld, van Mierlo, & Arends, 2011)	Individual- and team-level feedback are separately related to regulatory processes at different levels (e.g., DeShon et al., 2004)	Different antecedents predict efficacy at different levels (Chen & Bliese, 2002)	Affective tone as a group-level construct (George, 1995)
Studies that emphasize the dynamic character of team motivation	Task interdependence as a socially constructed process (Wageman & Gordon, 2005)	Convergence of needs for belongingness and identification at different levels (Sluss & Ashforth, 2008)	Top-down and bottom-up processes related to learning goal orientation and team discussion processes (e.g., Park & DeShon, 2010)	Dynamic relationship between individual-level and team-level regulatory processes (e.g., Chen et al., 2009)	Reciprocal relationships between team efficacy and team performance over time (e.g., Goncalo, Polman, & Maslach, 2010)	Affective linkages between team members and between leaders and team members (Ilies, Wagner, & Morgeson, 2007; Sy, Cote, & Saavedra, 2005)

Table 2: Integrating Conceptual Approaches and Content Areas— An Integrative Framework of Team Motivation

One of the advantages of our framework is that it enables us to directly assess the extent to which the shift to dynamic models that emphasize the multilevel nature of team behavior and work motivation has actually taken place. Ilgen et al. (2005) and Latham and Pinder (2005) optimistically posited that the two respective literatures have emphasized the dynamic and multilevel nature of team behavior and work motivation. Even though we wholeheartedly agree with the need to move team motivation research into this direction, clear evidence that this shift has taken place has been missing for the team motivation literature. In fact, Chen and Kanfer (2006: 236) have voiced doubts that the team motivation literature has been able to capture the complex interdependencies between the individual team member and the team as a whole, stating that it is “widely acknowledged that these interconnections are the most complex and least well understood aspects of motivation in teams.”

### The Collective and Dynamic Character of Team Motivation

Team motivation research varies in the extent to which the collective nature of team motivation is emphasized. Emphasizing the collective character of team motivation requires a discussion of the social interdependencies that exist between team members and between team members and the team as a whole. The notion of collective motivational states requires that team members are subject to influences that originate from the team and that create a shared motivational reality. Individual team members influence collective motivational processes, which in turn have implications for the motivation of individual team members (Chen & Kanfer, 2006; Weick, 1979).

The second dimension that we use in our integrative framework reflects the extent to which team motivation is conceptualized as a static or as a dynamic property. Some team motivation studies may take only a snapshot of a team motivational state at one point in time and investigate its influence on team outcomes. Also, there are some motivational constructs that are assumed to be relatively stable. For example, the majority of research on team design assumes that team design features by themselves are relatively static in nature such that they are externally determined and not subject to social influence processes (Perrow, 1967).

We view the two dimensions of our integrative framework as related yet distinct dimensions such that there are situations in which the two dimensions do not go hand in hand and in which relatively static representations of team motivation are paired with approaches to team motivation that emphasize the collective nature of team motivation and vice versa. Studying the dynamic processes through which team design influences team functioning can involve a focus on the different processes that teams go through when working in a specific team structure. This research question would be dynamic in nature, even though the team structure may be conceptualized as a relatively static input variable in the team motivational process. Thus, the collective property of a team motivational construct does not have to be equated with a more dynamic nature of the respective construct, which is why we treat the two dimensions as two independent dimensions in our integrative framework.

### Assessing the Team Motivation Literature with Our Integrative Framework

Figure 1 illustrates the two conceptual dimensions that we use in our integrative framework.

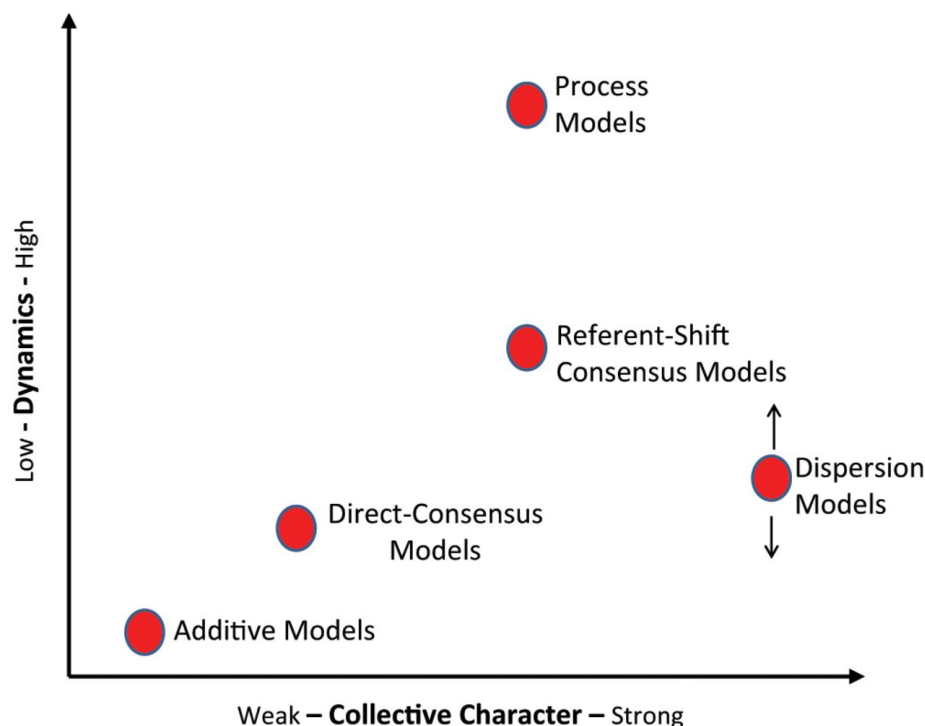


Figure 1: Different Conceptual Approaches to Team Motivation

We use five different composition models described by Chan (1998) as a decision aid to assess the extent to which the collective character and the dynamic character of team motivation have been emphasized in extant research on team motivation. These composition models describe the functional relationship between team motivation and team members' individual motivation, relying on different methods of measurement and aggregation. These composition models have also been used in other review articles investigating the functional relationships between constructs at different levels of analysis (Kuenzi & Schminke, 2009). These five composition models are additive, direct-consensus, referent-shift, process, and dispersion models. From left to right, the five

composition models are positioned in terms of their emphasis on collective characters of team motivation. For example, by shifting the referent from the individuals to the team, referent-shift models emphasize the collective character of team motivation more than additive or direct-consensus model. From bottom to top, the five composition models are positioned in terms of their emphasis on dynamic character of team motivation. For example, by explicitly modeling the dynamic processes through which team motivational states emerge and develop, process models of team motivation tend to emphasize the dynamic character of team motivation to a larger extent than referent-shift or direct-consensus models. Dispersion models are more difficult to classify in our framework than the previously discussed models. Dispersion models indicate the extent to which a shared collective motivational state is present. Thus, it becomes an empirical question whether the collective character of team motivation is emphasized or de-emphasized. Nevertheless, dispersion models are the only composition model that utilizes the degree of agreement in team motivational states as a substantive variable in research designs. As such, the collective character of team motivation not only constitutes a necessary prerequisite for aggregating individual perceptions of motivational states to the team level, but also takes center stage in the research design.

With respect to the dynamic character of dispersion models, different scenarios are plausible. Low dispersion can indicate strong social influence and contagion processes that have reduced the dispersion on relevant motivational constructs, but high dispersion can also indicate strong social influence processes such that conflict or diverse team membership may have pulled team members apart. In such a scenario, high dispersion does not indicate a lack of dynamics, but rather an abundance. Thus, the two arrows pointing up and down in Figure 1 indicate the variability of dispersion models with respect to the dynamic character of team motivation models.

We note that the collective and dynamic character can vary from research study to research study even within the same composition model. For example, research studies relying on a referent-shift consensus model can either explicitly model the dynamic team processes that lead to a shared collective motivational state or ignore them and simply discuss the collective motivational state as a starting point in research designs. Our Figure 1 helps to uncover the assumptions of different composition models employed in team motivation research, but we emphasize that this provides only an approximation of the extent to which the dynamic and collective character of team motivation have been emphasized.

## **Assessing the State of Team Motivation Literature**

### **Team Design**

#### *The collective character of team design*

Most of the research on horizontal interdependence (i.e., task interdependence) in teams relies on direct-consensus models to aggregate individual perceptions of horizontal interdependence to the team level (Barrick, Bradley, Kristof-Brown, & Colbert, 2007; Van der Vegt, Van de Vliert, & Oosterhof, 2003). The rationale behind this argument is that horizontal interdependence can be fully grasped by aggregating individual team members' perceptions of the interdependencies in their daily work to the team level. However, by relying on a direct-consensus model to measure horizontal

interdependence, research ignores the possibility that horizontal interdependence in teams is more than just the sum of the interdependencies between individual team members. There is the possibility that collective efforts facilitate the horizontal coordination between team members. Such collective properties of teams cannot be captured by operationalizing horizontal interdependence with direct-consensus models.

The widespread use of direct-consensus models in research on horizontal interdependence is also surprising when we consider that horizontal interdependence strengthens the collective character of teams—an effect that could not be captured by simply aggregating individual motivational states. For example, LePine, Piccolo, Jackson, Mathieu, and Saul (2008) showed in a meta-analysis that high task interdependence (i.e., high horizontal interdependence) between team members emphasizes the identity of the team and deemphasizes the significance of the individual team member. The reduction in the impact of individual differences associated with high horizontal interdependence is a direct indication of the extent to which the collective properties of the team become more powerful, whereas the influence of individual characteristics become less pronounced (Hollenbeck & Spitzmuller, 2012).

Contrary to horizontal interdependence, vertical interdependence is usually measured with a referent-shift consensus model according to which team members indicate the degree of autonomy that the team as a whole has in making decisions regarding schedules, task allocation, reward structures, feedback mechanisms, and disciplinary mechanisms. Indeed, research by Langfred (2000) shows that team autonomy is fundamentally different from autonomy on the individual level of analysis and that the two can even run counter to each other in teams. Therefore, aggregating individual autonomy to the team level would lead to an inaccurate picture of team structure. Within a military setting, individual autonomy had a positive effect on group effectiveness, while group autonomy (i.e., low vertical interdependence) had a negative effect. However, the opposite was true in a different sample of groups working in a social service agency where the team members were loosely coupled vertically. Here, group effectiveness was negatively associated with individual autonomy, but positively associated with group autonomy.

Very little research has relied on dispersion models to study the role of team design for team motivation and performance. This is somewhat surprising when we consider that experiences of different team design features will vary greatly from person to person and context to context. We were able to identify only two empirical investigations of dispersion effects in the context of team design. In the first study, Van der Vegt and Janssen (2003) found for teams with high levels of diversity that task interdependence was related to innovative behaviors only for individuals who also perceived high levels of goal interdependence, but not for team members who experienced low levels of goal interdependence in the same team. In the second study, Van der Vegt, Emans, and van De Vliert (2001) reported that within-group differences in perceptions of task interdependence were positively related to job and team satisfaction when goal interdependence in the team was high. These two studies show that team members will not always develop uniform perceptions of specific team design features, contrary to conventional wisdom that treats team design features as an externally determined structural reality. These two studies show that different perceptions of team design features also have important implications for attitudes and behavior in teams.

### *The dynamic character of team design*

Unfortunately, most of the research on team design is static in nature, not accounting for the processes through which specific team design features emerge and the processes through which they influence team behavior and performance. Research by Wageman and Gordon (2005) presents compelling arguments against such an oversimplified conceptualization of team design according to which team design features are static and externally determined. They showed that task interdependence is subject to change based on the values of team members at the time of group formation such that teams with members who endorse egalitarian values tend to demonstrate higher levels of task interdependence over time when compared to teams in which members endorse meritocratic values.

Other research addresses the problems associated with changes in team design features over time. The process of moving from a traditional team structure to a self-managing team structure requires a transition period until teams can function effectively again. Douglas and Gardner (2004) argued that managers often find it difficult to relinquish control over decision-making processes to self-managing teams such that they rely on hard influence tactics (i.e., coalition building, legitimating, and pressure) when the move to self-directed work teams would have called for the use of soft influence tactics (i.e., inspirational appeals and ingratiation). Over time, however, managers were able to increase the fit of their influence tactics with the requirements of the decision-making structure such that they reduced the use of hard influence tactics. Erez, LePine, and Elms (2002) provided a rare example of a study that investigated the emergence of different leadership structures in teams, differentiating between teams in which one leader emerged over time and teams in which leadership was rotated among team members. Drawing on a sample of self-managed undergraduate teams, they found that teams that rotated leadership exhibited higher levels of voice, cooperation, and team performance when compared to teams in which one leader emerged.

In another line of research on dynamic aspects of team design, research on structural adaptation theory indicates that changes in team design that lower the level of complexity in team design and that increase entropy in teams are easier or more natural, relative to movements in the other direction (Beersma et al., 2009; Ellis, Li, Hollenbeck, Ilgen, & Humphrey, 2006; Johnson et al., 2006; Moon et al., 2004). Work in this domain suggests that the manifestation of the merits and challenges of different team structures based on cross-sectional studies are contingent on the movement of the structures toward systems with less complexity and higher entropy (Hollenbeck & Spitzmuller, 2012). Moon et al. (2004) showed that teams that changed from a structure with high horizontal interdependence to a structure with low horizontal interdependence acted much like teams that were always arrayed in a structure with low horizontal interdependence, but that teams in which horizontal interdependence increased over time struggled to adapt in this direction, and performed worse relative to teams that had always performed under high horizontal interdependence.

Similarly, Ellis et al. (2006) found that teams that transitioned from centralized to decentralized decision-making structures (i.e., from a structure with high vertical interdependence to a structure with low vertical interdependence) acted very much like pure decentralized teams, but that teams that moved in the opposite direction experienced all the liabilities of centralized structures, but none of their benefits. These documented asymmetries in structural movement all imply that moving

toward more tightly coupled structures is less natural for people relative to movement in the other direction.

### **Future research**

Our previous review of research on team design indicates a wealth of research using static models of team design in which team design is conceptualized as an externally determined and stable characteristic. Such a perspective belies the complex nature of team design, however, which is a function not only of job descriptions and predetermined decision making structures but also of the complex social behaviors exhibited by team members. Understanding the reciprocal influences between team members' values, behaviors, and the structural reality of a team should be a concern for future research on team design.

In addition to a more process-oriented perspective, we call for more research adopting a dispersion approach to studying the effects of team design on team functioning and team performance. Extant research suggests that both tight horizontal and vertical coupling can be mixed blessings for teams and that structures that create moderately strong interdependence between team members and that give teams moderate degrees of autonomy might be associated with highest levels of performance and team member satisfaction (Hollenbeck & Spitzmuller, 2012; Spitzmuller, 2010). Both high and low levels of horizontal and vertical interdependence create different strengths and liabilities that teams can capitalize on in different environments and contexts. Thus, the gains/losses associated with the freedoms/constraints of either tight or loose coupling over time are being constantly evaluated by team members, who adjust their coupling based on their experience.

### **Team Needs**

#### *The collective character of team needs*

By aggregating individual perceptions of need satisfaction to the team level, researchers can investigate the influence of needs on team outcomes. Additive or direct-consensus models have been the dominant approach to studying team needs. Adopting such a conceptual approach requires a careful deliberation of whether consensus between the individual needs constitutes a necessary requirement for aggregation from the individual to the team level. Some research has taken this position, arguing that team needs can exist only if there is sufficient consensus between team members in their perceptions of needs, leading to the use of direct-consensus composition model (Wagner, Parker, & Christiansen, 2003). Conversely, others have put forth the argument that individual needs arise relatively independent of the needs that other team members experience at one point in time, the latter argument being the dominant position in research on team needs (Kearney, Gebert, & Voelpel, 2009). This argument is also consistent with research on self-determination theory, which argues that all humans will experience the same basic needs, irrespective of their social environment and other contextual influences.

Relying on an additive model of aggregation, Kearney et al. (2009) investigated the moderating role of team need for cognition in the relationship between both age and educational specialization diversity and elaboration of task-relevant information, collective team identification, and ultimately team performance. This approach assumes that the need for cognition is a motivational trait at the individual level that can be aggregated to the group level without agreement between the individual

team members regarding the strength of their respective need for cognition. Consistent with their predictions, they found that age and educational specialization diversity was positively associated with their outcome variables when team need for cognition was high.

Even though additive models of aggregation dominate research on team needs, a study by Wagner et al. (2003) exemplifies the use of a direct-consensus composition model in research on team needs. The study investigated the effect of a climate of self-determination on ownership beliefs in teams, ownership behaviors, employee attitudes toward the organization, and financial performance. They had respondents rate their perceptions of opportunities to participate in managerial decision making, receive training, and receive recognition in their teams. These responses were then averaged for each team. Thus, based on this operationalization of a climate for self-determination, it is more of a structural variable indicating the involvement of individuals in the decision-making process, and less of a basic need in the tradition of needs theories. This explains why sufficient consensus was deemed necessary to aggregate individual responses to the team level.

Even though extant research has not conceptualized team needs as a collective phenomenon of teams that would be reflected in the use of referent-shift consensus models, some research implicitly invokes this argument. Research on team identity implicitly makes the argument that a team identity satisfies a collective desire to experience belongingness and to differentiate the team from other teams. For example, Somech, Desivilya, and Lidogoster (2009) found that team identity moderates the relationship between task interdependence and conflict management style such that a high team identity leads to a positive relationship between task interdependence and a cooperative style of conflict management, whereas a weak team identity is associated with a competitive style of conflict management. A similar finding was reported by Van der Vegt and Bunderson (2005), who found that collective identification moderates the relationship between expertise diversity and team learning and performance such that the relationship is positive only when collective identification is high.

Using dispersion models to study team needs acknowledges that not all team members have the same needs and that not all team members will satisfy their needs to the same extent at one point in time. Thus, by relying on dispersion models, the implications of different experiences of needs or varying degrees of need satisfaction in members of the same team can be studied. Interestingly, to our best knowledge, no research in the organization sciences has adopted a dispersion model to study needs in teams. This is surprising because social psychological research clearly shows the value of adopting a dispersion model in research on needs in teams. For example, uniqueness theory (Snyder & Fromkin, 1980) and optimal distinctiveness theory (Brewer, 1991) have argued that individuals seek to establish a moderate sense of belongingness and distinctiveness in relation to other team members. Moreover, optimal distinctiveness theory makes the argument that individuals generally satisfy their need for belongingness by emphasizing the fit of the individual to the in-group, whereas the need for distinctiveness is generally satisfied by contrasting attributes of the in-group with attributes of out-groups. Thus, the theory pushes the relative standing of the individual in the team and relative to out-groups to the center.

#### *The dynamic character of team needs*

Satisfying needs is an iterative process in which actions are initiated that minimize the internal tensions that result from unsatisfied needs. As part of this process, individuals have to balance their



own personal needs with the respective needs of other team members and their team. Need satisfaction in teams is influenced by characteristics of the task, goals, decision-making structures, and personalities of team members. Unfortunately, however, very little research has investigated the dynamic processes through which needs are satisfied in teams.

In one of the few articles on this topic, Sluss and Ashforth (2008) proposed a conceptual model according to which the identification of the individual with his or her relationships, groups, the organization, and other workplace targets (i.e., the need for belongingness) is a dynamic process in which bottom-up and top-down influences determine the level of identification with specific targets of identification. For our discussion of team needs, this shows how the identification with a collective results from a complex interplay of workplace experiences that are ascribed to represent influences of different levels in the organization.

In another conceptual article on team needs, Morgeson, DeRue, and Karam (2010) proposed 15 team leadership functions that can help satisfy team needs and foster goal accomplishment. Morgeson and colleagues posited that teams have different functional needs during transition and action phases. In transition phases, teams have a need for a team charter, goal setting, team norms, a performance strategy, a shared understanding, and a clear distribution of knowledge. During action phases, teams need to monitor output, people, resources, stockholders, and their environment. They need to coordinate actions, communicate, and maintain the boundaries of the team. The review chapter by Morgeson and colleagues provides the only available practical advice on how to manage team needs effectively in different stages of team functioning. The nature of the needs described in Morgeson et al. (2010) is largely a list of functional imperatives. As such, it is different from the needs that are typically described in a motivational context, referring to an internal tension that guides the cognition and behavior in teams.

## **Future research**

Our review of previous research on needs in teams already points to three pressing research needs for the future. First, more research is needed investigating the extent to which team members converge in their perceptions of needs. Extant research largely assumes that the strength of individual needs is driven by dispositional factors or that needs are universal such that contextual features or characteristics of the team would not influence the strength of needs. And while there is some support for the universality of certain individual needs, such as for the need for personal autonomy (Deci & Ryan, 2002), there is also evidence supporting the notion that different cultures and different contextual features strengthen the desire in individuals to satisfy specific needs at the expense of other needs at certain points in time (Ajila, 1997; Haslam, Powell, & Turner, 2000). Indeed, recent research indicates that team design features will influence the extent to which individuals are able to satisfy specific needs and that there is some convergence in team members' needs perceptions (Spitzmuller, 2010).

Our review of research on team needs pointed out the dearth of research on need dispersion in teams. Thus, we urge future research to fill this gap and to study the role of need dispersion for team functioning and performance. It is possible that consequences of need satisfaction in teams will vary if one team member is the only person in a team who is capable of satisfying his or her

personal needs in a team in which all other team members show signs of need deprivation, compared to a team in which satisfaction of the respective need is commonplace.

A third area for future research that follows from our review of the team needs literature is the investigation of the processes through which team needs are satisfied. Even though we begin to develop a better understanding of the positive consequences that follow from satisfaction of specific needs in teams, there is virtually no research investigating the processes and contingencies that operate during the pursuit of need satisfaction in teams. Such a research program would have to address a number of questions. First, which team design features and which configurations of relationships are most conducive to satisfying specific needs in teams? Second, what are the mechanisms through which needs become satisfied in teams? Third, what are the social dynamics that emanate from the pursuit of need satisfaction in teams?

## **Team Goals**

### *The collective character of team goals*

Studies that rely on additive composition models examine individual goals within teams and the impact of individual goals on team processes and outcomes. This approach is particularly appropriate for teams that work on tasks characterized by low interdependence or for teams that were created for short time periods in which shared goals will not be developed. For example, Porter (2005) posited that the average of team members' individual goal orientations adequately captures team-level goal orientation. He argued that the limited interactions among team members imply that individuals maintain their individual goal orientation in the team context and exhibit behaviors that are consistent with their individual goal orientation. Teams with higher individual-level learning goal orientations would be more likely to exhibit learning-oriented behaviors (e.g., exchange information), which would in turn facilitate task mastery. Consistent with this prediction, Porter (2005) found that the average individual learning goal orientation was positively related to the extent to which team members supported each other and to overall team performance.

In a similar vein, LePine (2005) focused on individual goal orientation, studying how individual goal orientations interact with team goal difficulty levels to influence the team's adaptive potential. In his study, teams experienced an unexpected change in their task environment such that role structure adaptation was critical for team success. LePine (2005) found that individual team members' level of learning and performance goal orientation played an important role for predicting team effort in challenging situations and adaptive performance. When team members had a high learning goal orientation, a difficult team goal increased team adaptive performance. Conversely, when team members had a high performance goal orientation, a difficult team goal decreased team adaptive performance. In sum, research that relied on aggregations of individual goals to the team level shows some support for the notion that team goals are homologous representations of individual goals.

Studies that rely on referent-shift consensus models emphasize the role of shared team goals for team processes and team outcomes. In addition, studies have argued that shared team contexts and social interaction among team members facilitate the development of shared team goals that are

distinct from individual goals. Accordingly, the aggregation of individual-level goals does not appropriately represent team goals. Mehta, Feild, Armenakis, and Mehta (2009) argued that team members develop a shared perception of their team's goal orientation through contextual cues that are exerted via a top-down effect, whereas social interaction is exerted via a bottom-up effect. Similarly, Dragoni (2005) proposed a theoretical model to delineate the development of shared team goal orientation. Team goal orientation has unique team-level antecedents, such as planning a leader's achievement orientation with an emphasis on personal development or avoiding failure.

Conversely, studies that relied on referent-shift consensus models placed a stronger focus on the distinct character of team goals, positing that both individual and team goals exert unique effects on team processes and outcomes. Dierdorff, Bell, and Belohlav (2011) suggested that individuals in a team experience multiple goal environments and must decide whether to work on their personal goals or the collective team goal. Dierdorff et al. showed that average team goal priority scores explained the extent to which individual team members valued team goals over individual goals. Moreover, average team goal priority scores predicted overall effort allocated to the team task and team performance. Findings also revealed that variance in goal priority among team members, that is, the level of disagreement among team members in terms of prioritizing team goals over individual goals, was negatively related to team performance.

Kleingeld, van Mierlo, and Arends (2011) argued that teams have multilevel goal environments in which team and individual goals are developed. In a meta-analysis of team goal setting studies, Kleingeld et al. found that the effect of team goal setting on team performance depended on characteristics of individual goals. Findings suggested that group-centric individual goals that aimed to maximize individual contributions to the team had a positive effect on team performance. Zhang and Chiu (2011) demonstrated that perceived sharedness of personal goals within groups increased team member commitment to overall team goals. Again, this study emphasizes the value of a configurational approach to goals in teams by recognizing the interplay of individual and team goals as predictors of team effectiveness.

Studies have also examined the degree of sharedness of team goals among constituents and its impact of team processes. Using a sample of top management teams that consisted of CEOs and vice presidents, Colbert, Kristof-Brown, Bradley, and Barrick (2008) found that the degree of convergence of goal importance ratings predicted follower attitudes and organizational-level performance. One interesting finding was that goal dispersion did not always yield the same effect. Instead, the negative effect on follower attitudes appeared only when the follower had a lower goal importance rating compared to the leader. This finding highlights the need to pay attention to the configuration of goal importance ratings as well as the average disagreement among team constituents.

#### *The dynamic character of team goals*

Studies on team goals also vary in their emphasis of static versus dynamic relationships. Examples of a static approach include studies that focus on team members' dispositional characteristics or the impact of different types of team goal orientation on overall team effectiveness. For example, Porter (2005) examined the effect of individual trait goal orientation on backup behaviors in teams. This research assumed that individuals would sustain their individual goal orientation in the context of a team. In a similar vein, Van der Vegt et al. (2003) proposed that team goals are a function of team work settings and as such are less subject to change. Specifically, goal interdependence, the extent

to which team members perceive their goals as interrelated, was examined as a stable work characteristic. Van der Vegt et al. found that goal interdependence interacted with task interdependence to predict individual citizenship behaviors such as helping others and compliance in team. A dynamic approach to team goals focuses on identifying the changing nature of team goals and their relationships with team outcomes, explicating the mechanisms through which team goals influence team effectiveness (G. Park & DeShon, 2010). Taking a dynamic approach also acknowledges contingencies in the relationship between team goals and team outcomes (Bunderson & Sutcliffe, 2003). Such studies often point to useful interventions that can maximize the effectiveness of team goals (Pieterse, van Knippenberg, & van Ginkel, 2011). G. Park and DeShon (2010) focused on the multilevel processes through which team goal orientation influences team decision-making effectiveness. A top-down process specified the impact of team learning goal orientation on team member confidence, while a bottom-up process specified the impact of team member confidence on team discussion quality and quantity. Consistent with the hypotheses, dissenting team members with opposing opinions had higher confidence when teams had a high learning goal orientation. When team members with dissenting opinions had higher confidence, they were more likely to speak up, and the quality and quantity of team-level discussions improved, which led to greater team decision effectiveness.

Using a sample of business unit management teams, Bunderson and Sutcliffe (2003) identified dynamic contingencies in the relationship between team learning goal orientation and team performance. Results showed that learning goal orientation was not as instrumental to increasing team performance for teams that already performed well compared to teams that did not perform well. In addition, Porter, Itir Gogus, and Yu (2010) identified a dynamic relationship among team learning goals, team performance goals, and adaptive performance. When no slack resources were available, teams experienced a trade-off in their pursuit of a learning or performance goal. That is, for the initial adaptation phase, teams that pursued both learning and performance goals showed difficulty in meeting both goals and performance declined. However, by gaining more experience balancing competing demands, teams that pursued both goals saw an increase in adaptive performance in the later phase.

### **Future research**

Research in the domain of team goals has utilized a diverse set of approaches for both of our two conceptual dimensions. However, most of these studies pertain to situations in which teams are working on a single goal and there is a dearth of research on teams working on multiple goals. This is an important omission as teams often engage in multiple tasks with competing demands. As Marks, Mathieu, and Zaccaro (2001) pointed out, at any one point in time, teams engage in multiple performance episodes in different phases of task accomplishment. Therefore, teams have to be able to effectively prioritize and balance competing demands that come with pursuing multiple goals.

Considering multiple team goals increases the complexity of models of team motivation. Not surprisingly, research here is still in its nascent stages. Studies of multiple goal pursuit at the individual level may provide a useful direction for understanding multiple goal pursuit at the team level. Mitchell, Harman, Lee, and Lee (2008) argued that spacing (the amount of resources devoted to a goal) and pacing (the amount of time devoted to a goal) tactics are critical for successful pursuit of multiple goals at the individual level. The authors also propose that goal prioritization is affected

by deadlines, the importance of task, task liking, and accountability. Examining those factors along with unique team-level processes such as coordination, role assignment, and leadership behaviors might give us a promising direction for future research on multiple team goals.

## **Team Regulation**

### *The collective character of team regulation*

Research in this area generally assumes that team regulation can be captured adequately by aggregating individual self-regulation to the team level. As their main focus is on individual regulatory processes in teams, those studies seek to identify factors that influence self-regulation processes of individuals. Wallace and Chen (2006) suggested that individual team members' regulatory focus is shaped by team contextual cues. Wallace and Chen proposed a top-down process through which team safety climate would influence members' regulatory focus, which would then predict individual productivity and safety performance. Also, Kark and van Dijk (2007) discussed the processes through which team leaders' regulatory focus influenced team members' regulatory focus and subsequent behaviors. E. S. Park and Hinsz (2006) argued that a team provides unique conditions that shape its members' regulatory focus and influence their motivational and emotional processes.

Research that relies on referent-shift consensus models refers to team regulation as a team-level process that enables coordination and cooperation processes among team members. Such research focuses on identifying team regulatory processes that are distinct from individual regulation in teams. Van der Vegt, de Jong, Bunderson, and Molleman (2010) claimed that offering team feedback instills a collective orientation of team members and facilitates coordination toward common objectives. By contrast, giving individual feedback promotes an individualistic orientation. In addition, using a multilevel model of performance in teams, DeShon et al. (2004) proposed a multilevel dynamic process approach to team regulation based on which team members engage in two separate and homologous regulation processes at the individual and team levels that function as a feedback loop for goals at the two levels. Therefore, team members constantly have to decide how to allocate resources (i.e., time and effort) between the two feedback loops.

Similarly, research on team metacognition points out the importance of collective team regulatory aids to increase overall team regulatory effectiveness. De Dreu (2007) defined team reflexivity as the extent to which team members engage in overt reflection on the group's progress toward their group objectives, devise strategies, and plan to implement strategies. Gurtner et al. (2007) showed that teams that received a reflexivity intervention were more likely to engage in strategy communication and implementation. Moreover, these teams showed greater similarity in team mental models when compared to teams without the reflexivity intervention, which led to better team performance. Mehta et al. (2009) suggested that team planning (i.e., the process of setting up a specific course of action to attain a team objective) is an effective team regulatory tactic that can increase team performance.

Using dispersion models in research on team self-regulation allows for examinations of differences among team regulatory processes and their respective impact on team outcomes. Extant research on team regulation largely assumes that team members go through similar team regulation processes. Only very little research has relied on dispersion approaches in research on team self-

regulation. One exception is the study by Gibson, Cooper, and Conger (2009). They investigated the influence of within-team perceptual disparity of feedback on team performance. They found that the greater the difference in team members' perceptions of the extent to which their team accomplished a team goal (i.e., goal discrepancy), the lower their team performance. This finding shows how disparity in perceptions of team feedback influences team dynamics and team performance.

#### *The dynamic character of team regulation*

Although team regulation by definition constitutes a dynamic topic, studies of team regulation have not always emphasized the dynamic nature of team regulation adequately. Adopting a more static approach to team regulation, some studies have investigated the association between team feedback and team effectiveness. Van der Vegt et al. (2001) surveyed teams concerning perceived team feedback availability, task interdependence, and satisfaction. Results showed that team feedback was an important determinant of team member satisfaction, especially when their task was interdependent. Loughry and Tosi (2008) submitted that peer-monitoring behaviors could function as an effective lateral control behavior that would enhance the effectiveness of team regulation. In their study, they asked team members to indicate the extent to which they engaged in various peer-monitoring behaviors such as correcting inadequate teammate behaviors and praising effective teammate behaviors. Their findings revealed a positive relationship between peer-monitoring behaviors and team performance. In addition, Bachrach et al. (2001) found that giving teams false positive feedback increased citizenship behaviors (e.g., helping) toward other team members. Studies that conceptualize team regulation as a static phenomenon are helpful in increasing our understanding of the relationships between different characteristics of feedback (such as source or valence) and team member behaviors and attitudes.

While much theoretical work has been done on dynamic team regulation, there is only limited empirical research in this area. We have observed a steep increase in theoretical advancements conceptualizing team regulation as a dynamic process. For example, the recurring temporal model of team processes (Marks et al., 2001) is arguably the most well-known dynamic approach to team regulation. In this model, Marks et al. (2001) proposed that teams go through a series of performance episodes in their pursuit of team goals. These episodes consist of two repeated and distinguishable phases: the action and the transition phases. In the action phase, teams contribute directly to goal accomplishment, whereas teams focus on evaluation and planning activities in the transition phase.

Only limited efforts have been made to investigate the dynamic nature of team regulatory processes over time. In a noteworthy exception, using a multilevel model of performance in teams, Chen et al. (2009) demonstrated that individual and team-level goal regulatory processes are related, even though there are distinct motivational processes with different antecedents at play at different levels. The findings suggest that team regulation evolves through cross-level relationships between individual and team motivation such that regulatory processes of the two levels would be dynamically linked over time.

#### *Future research*

Studies on team regulation provide little integration with other topics of team motivation. This hinders the development of a comprehensive understanding of team regulation processes. Studies on team feedback (e.g., Bachrach et al., 2001; Gibson et al., 2009; Lam, Schaubroeck, Brown, 2004; Peterson & Behfar, 2003), team reflexivity (Gurtner et al., 2007), and team planning (Mehta et al., 2009) all deal with different aspects of the team regulation process. Yet there have been only a few integrative attempts to examine common underlying themes in team regulation. This lack of integrative work in team regulation research is somewhat ironic given the fact that regulation theory emphasizes the need to have continuous and recurring cycles of different motivational components.

Although the extant research on regulatory processes suggests that successful regulation processes require efficient execution in all four different phases of regulation—goal establishment, planning, goal striving, and goal evaluation—research on team regulation so far has largely focused on a narrow set of those phases. Specifically, there is a lack of research that investigates the planning phase of regulation processes. This is an important gap as planning serves as a link between goals and the behaviors needed to accomplish the goals. Thus, a thorough understanding of this planning phase would allow scholars to gain a better understanding of how teams implement their goals. In this light, Gollwitzer (1999) demonstrated the importance of developing implementation intentions for goals at the individual level as it ensures that individuals stay focused on their goals. At the team level, however, little research exists on team implementation intentions.

## **Team Efficacy**

### *The collective character of team efficacy*

Team efficacy research that deemphasizes the collective character of team efficacy posits that the aggregate of individual self-efficacy perceptions represent team efficacy adequately. The focus of these studies is on the impact of team member self-efficacy on team processes and outcomes. For example, Lam, Chen, and Schaubroeck (2002) examined the role of team member participative self-efficacy for team functioning. They showed that high participative efficacy in team members led to more participatory decision-making processes, which resulted in higher team performance. Also, using self-managing project teams, Tasa, Taggar, and Seijts (2007) demonstrated a positive relationship between team member self-efficacy and teamwork behaviors such as managing deadlines, encouraging active task-relevant communications, and strategy development.

The majority of research on team efficacy has relied on referent-shift consensus models, conceptualizing team efficacy as an emergent team state. Such approaches recognize the social dynamics between team members and conceptualize team efficacy as related, yet distinct from individual team members' self-efficacy (also see Gully, Incalcaterra, Joshi, & Beaubien, 2002). This allows for the possibility that a group of efficacious individuals could develop a relatively low level of collective efficacy if team processes were dysfunctional. Consistent with this perspective, Chen and Bliese (2002) found that individual and collective efficacy had distinctive predictors. Using combat units of the U.S. Army who had worked together for more than 7 months, they found that collective efficacy exhibited a stronger relationship with team-level predictors such as leadership climate. Meanwhile, leadership climate was only indirectly related to individual self-efficacy.

Unlike referent-shift composition models that assume that team members share similar perceptions of team efficacy, dispersion models of team efficacy suggest that team members' perceptions of team efficacy can be quite different from each other. According to this approach, the extent to which team members disagree in their perceptions of team efficacy has important implications for team members' coordinated efforts and outcomes. Unfortunately, dispersion approaches in team efficacy research have not enjoyed a lot of popularity. This is partly due to the belief that there has to be consensus in team members' perceptions of team efficacy, as stipulated by referent-shift consensus models. In addition, previous research has treated the degree of disagreement in team efficacy beliefs as measurement error, rather than as a meaningful indicator of the quality of team processes. In their theoretical article on dispersion models of team efficacy, DeRue, Hollenbeck, Ilgen, and Feltz (2010) argued against such an overemphasis on consensus in team efficacy beliefs. They posited that the pattern of disagreement on team efficacy beliefs among team members has important implications for work and social dynamics in teams.

### *The dynamic character of team efficacy*

Studies with a more static approach de-emphasize the role of time and assume that team efficacy generally has a positive influence on team processes and outcomes. For example, Srivastava et al. (2006) surveyed management teams in a hotel chain company on their team efficacy and perceptions of empowering leadership. Findings revealed a positive relationship among empowering leadership, team efficacy, and team performance. In addition, Alper, Tjosvold, and Law (2000) showed a positive relationship between different types of conflict approaches (i.e., cooperative and competitive) in teams and team efficacy.

Team efficacy studies that have taken a dynamic approach have investigated how the relationship between team efficacy and team outcomes could change over time. Goncalo, Polman, and Maslach (2010) conducted a longitudinal study of team efficacy to measure team efficacy and perceived process conflicts at multiple points of time. Results suggested that teams with a high level of team efficacy during the early stages of team functioning experienced less process conflict early on. Interestingly, this high collective efficacy decreased overall performance by the end of the study period. In contrast, teams with a high level of collective efficacy during later stages of group functioning experienced more process conflict early on and had higher team performance toward the end.

Studies adopting a dynamic approach to team efficacy also focus on identifying the contingencies in the relationship between team efficacy and team outcomes. Tasa et al. (2007) showed that team efficacy changes over time through its interaction with individual-level task relevant knowledge and team members' teamwork behaviors. This study addressed the dynamic nature of team efficacy using a longitudinal design where team efficacy levels of business simulation project teams are measured at two time points over 10 weeks. They found that team efficacy at Time 2 was predicted by both team efficacy at Time 1 and teamwork behaviors. Chen et al. (2009) proposed a multilevel process model of motivation and performance of teams and specified a cyclical input–process–output model of team motivation involving team efficacy. The model highlighted the dynamic role of team efficacy where it mediates the relationships between prior team performance and subsequent team action processes.

### *Future research*



While team efficacy is conceptualized as a dynamic state variable that evolves through team performance cycles, there is a lack of understanding of factors involving changes in team efficacy over time. We need a better understanding of differences in team efficacy trajectories over time, and how such patterns of changes affect overall team regulatory processes. For example, upon receiving negative feedback, some teams show a failure in recovering their efficacy level. Conversely, others maintain their efficacy, which helps them to coordinate and develop better strategies for the next performance cycle. Fortunately, we are starting to see more empirical studies delineating the dynamic mechanisms related to changes in team efficacy over time. We encourage additional research in this area, addressing when and how team efficacy constantly changes through its interaction with effective team processes and outcomes.

## **Team Affect**

### *The collective character of team affect*

The consensus in the field is that teams share an affective reality that constitutes a relatively homogeneous set of affective experiences and reactions to external events. It is even possible to manipulate collective affective experiences in a laboratory context in teams that do not have a common history or a long-term interaction. Van Knippenberg et al. (2010) manipulated team affect and demonstrated sufficient consensus in affective experiences in teams with respect to positive affect and negative affect. Such convergence, however, does not always occur. Totterdell, Wall, Holman, Diamond, and Epitropaki (2004) argued that structural features can determine the degree of consensus in affective experiences in teams. They found in a social network analysis that similarity in affect is influenced by the presence of work ties and structural equivalence. Most of the research on affective linkages in teams has relied on direct-consensus models, arguing that there has to be sufficient consensus in team members' affective experiences for a collective affective experience to be present (Ilies et al., 2007; Sy et al., 2005).

Relying on referent-shift models to measure collective affective experiences moves the level of measurement from the individual affective experience to the shared collective affective experience. For example, Mason and Griffin (2003) measured group affective tone with a referent-shift consensus model, using items such as "there is a lot of energy in my work unit." They investigated the effects of group affective tone on absenteeism over time and showed that differential effects unfolded over time. Similarly, Cole, Walter, and Bruch (2008) relied on a referent-shift model to measure negative team affective tone. They found that negative team affective tone mediated the relationship between dysfunctional team behavior and performance when teams' nonverbal negative expressivity was high, but not when nonverbal expressivity was low. The study by Cole and colleagues shows how the consequences of affect are contingent on the way that emotions are being expressed to other team members. Indeed, experiencing negative emotions and displaying negative emotions do not always have to coincide.

Measuring group affective tone with a referent-shift consensus model recognizes that collective emotional experiences are more than simply the aggregate of individual-level emotional experiences. This also suggests that it may require different skills to recognize collective emotions than the skills required to identify individual emotions. Following this line of reasoning, Sanchez-

Burks and Huy (2009) introduced the construct emotional aperture, defined as the ability to recognize the composition of diverse emotions in a collective. An important feature of emotional aperture is that individuals are most likely to recognize the affective composition in a team if they utilize a holistic decision making process in which they focus on the overall affective impression of the group, instead of trying to dissect the emotions experienced by the individual group members. Again, this shows that collective affective experiences are more than just the aggregation of individual affective experiences. Sanchez-Burks and Huy (2009) suggested that emotional aperture has important implications for the success with which leaders can manage collective emotions, for example in organizational change in which diverse emotions tend to appear in a collective.

The dispersion of individual affective experiences in teams was also found to have important implications for team behavior. Barsade and colleagues (2000) investigated in a study of top management teams how diversity in trait-positive affect in teams influenced individual attitudes, group processes, and group performance. They found that the degree of affective fit between the individual and the group predicted positive attitudes about the group and perceived impact on group processes. Also, diversity in positive affect in top management teams decreased the likelihood that CEOs would rely on participatory decision making and was associated with lower financial performance. Finally, teams that had high trait variability on positive affect and low mean levels of positive affect experienced the highest amount of task and emotional conflict and the least cooperation. Interestingly, diversity in trait negative affect did not affect group processes or group outcomes.

#### *The dynamic character of team affect*

There is a substantial body of research investigating the processes through which shared affective experiences emerge in teams. Kelly and Barsade (2001) proposed a conceptual model describing the affective context and the nonaffective context that determines the emergence of group emotions. According to their model, individual variables such as dispositional affect, moods, emotions, sentiments, and emotional intelligence provide the input that teams will subsequently draw from when developing group emotions. The development of group emotions can occur in implicit and explicit ways. Implicit influences occur through emotional contagion and entrainment, while explicit influences take place through modeling and goal-directed manipulation, usually initiated by leaders in the organization. Finally, organization-wide emotion norms and the group's particular emotional history can constrain or amplify the processes through which shared affective experiences develop.

Emotional contagion and the emergence of group emotions have been observed both in the laboratory context and in field studies. Barsade (2002) found in a laboratory study that a confederate was able to transfer positive or negative affect to fellow group members. Interestingly, only the overall mood was transmitted to other team members, but not the valence or activation of affective experiences. Barsade also found that positive emotional contagion improved cooperation, decreased conflict, and increased overall task performance.

Similar to Barsade (2002), Bartel and Saavedra (2000) found in a field study that groups develop shared affective experiences. In their study, the emergence of convergence in group emotions could even be detected by independent observers who were blind to the study's hypotheses. Convergence was found for eight types of moods that were derived from the circumplex model of mood (Larsen & Diener, 1992), comprising the two axes activation and valence. Convergence in members' moods

was highest for teams with high task interdependence, social interdependence, membership stability, and mood regulation norms. This is an interesting finding because it contradicts findings reported by Barsade (2002), according to which only the overall affective experience could be shared between group members, but not the valence or activation of affect.

In a longitudinal study in a naturalistic team setting, Ilies et al. (2007) provided additional support for the existence of affective linkages in teams. They found that average affective states in teams influence the affective experience of individual team members, even after controlling for overall team performance. Individual-difference characteristics such as susceptibility to emotional contagion and collectivistic tendencies emerged as factors that amplify the strength of affective linkages in teams. Other evidence suggests that team leaders play a particularly important role in the development of team affect. For example, Sy et al. (2005) found that leaders' moods influence team members' moods and group affective tone. Also, teams with leaders in a positive mood exhibited more coordination and expended less effort than did groups with leaders in a negative mood. Walter and Bruch (2007) further elaborated on the idea of emotional contagion in teams, proposing in a conceptual model that a positive group affect spiral can develop in teams. This process is fueled by affective sharing and affective similarity–attraction between team members. This article makes an important contribution to research on affective linkages in teams by identifying a self-reinforcing cycle through which a positive collective affective climate can develop.

#### *Future research*

The surge in research on team affect is likely to continue in the years to come. We call for additional research investigating the processes through which affective linkages in teams influence team functioning and performance. This includes a discussion of the interactions between trait affect and state affect. Recent research by van Knippenberg et al. (2010) suggests that team trait affect and team affective experiences interact to predict team behavior and team outcomes. By drawing from Forgas's (1995) affect infusion model, van Knippenberg and colleagues found that positive mood in teams was associated with lower quality decisions when group members were low in trait affect, compared to teams in which team members experienced neutral or negative mood. Interestingly, however, different competing theoretical frameworks have been proposed to study the interaction between trait and state team affect. The affect infusion model (Forgas, 1995) proposes that there are situations in which mood will not influence our cognition and behavior. Instead, dispositional affective tendencies can override the influence of specific moods in some situations. Conversely, state–trait consistency theories argue that experiencing mood states that are consistent with dispositional affective orientations would have instrumental benefits for individuals, irrespective of the valence of emotions (Tamir & Robinson, 2004; Tamir, Robinson, & Clore, 2002). Up to this point, state–trait consistency theories have been tested only at the individual level of analysis. Thus, we encourage future research to examine whether teams can benefit from experiencing mood states that are consistent with the overall dispositional affective orientations of the team. Moreover, research should address the contingencies that determine when affect infusion or state–trait consistency theories prevail in predicting the role of collective emotional experiences in teams.

Given recent advancements in research investigating the dynamic interplay of moods on the individual level of analysis, we also encourage additional research on the interplay of collective mood states. Bledow, Schmitt, Frese, and Kühnel (2011) showed that the experience of negative

mood in the morning was positively associated with work engagement in the afternoon if negative mood was followed by positive mood. We encourage research to investigate whether this interesting finding also generalizes to the team level of analysis. On a general level, more research is needed investigating the interplay of different collective mood states over time.

### Toward a Theory of Interdependent Regulatory Dynamics in Team Motivation

Ignoring the interdependencies among the six content areas of team motivation would create an oversimplified account of the complex nature of team motivation. Thus, to connect the different content domains of team motivation with each other, we have developed a theory of interdependent regulatory dynamics. This theory integrates the different content domains on the individual and team levels. Our model of interdependent regulatory dynamics highlights the processes through which team members' efforts are coordinated and geared toward effective team regulation. The model is summarized in Figure 2.

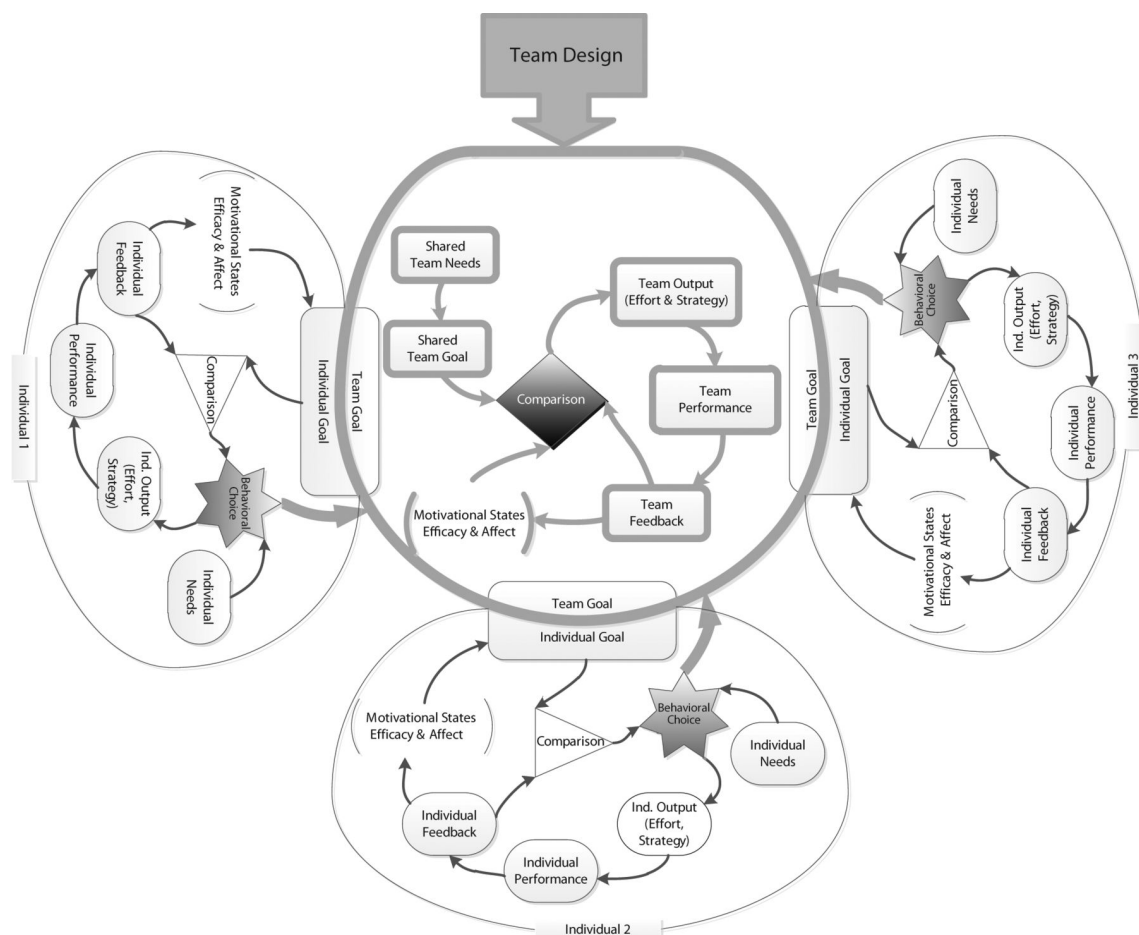


Figure 2: A Theoretical Model of Interdependent Regulatory Dynamics

Our theory of interdependent regulatory dynamics emphasizes the role of feedback loops for self-regulation. Self-regulation research (Carver & Scheier, 1998) posits that human behavior is driven by the desire to constantly reduce the discrepancy between goals and actual performance levels. As can be seen from Figure 2, there are two feedback loops controlling individual behavior in teams. The three peripheral circles represent each team member's individual feedback loop regulating each

member's personal goal pursuit. The one central circle represents the team feedback loop that regulates collaborative interactions in the pursuit of collective team goals. The defining feature of the theoretical model is the interdependent nature of the individual feedback loops and the team feedback loop as the feedback loops evolve over time. As such, the theoretical model incorporates both the collective and the dynamic character of team motivation, consistent with the framework that we used to review past research of team motivation.

### **Individual Feedback Loops**

When we assume a minimum level of interdependence among individual team members, the behaviors of those individuals can best be construed as a function of their individual feedback loops. The primary drive of those individuals is the desire to satisfy their personal needs and to meet their individual goals (Carver & Scheier, 1998). Individuals constantly compare their current performance levels with a desired standard (i.e., goal). To reduce discrepancies between their current performance and their goals, individuals put forth effort and execute a strategy. Goals and strategies represent the outputs of the feedback loop system. Therefore, human performance can be conceptualized as the result of a dynamic process in which individuals target to reduce the discrepancy between their current performance levels and goals. Feedback informs individuals of their current level of performance and their progress toward their goals. Such feedback then triggers the development of motivational states, including affective states and efficacy perceptions (Ilies & Judge, 2005; Tolli & Schmidt, 2008). Such motivational states influence subsequent revisions of goals. The revised goal will then initiate a new performance episode in which current performance levels are being compared against aspiration levels.

When there is a minimum level of interdependence between team members, individual difference constructs and differences in individuals' needs play a prominent role for self-regulatory processes (Elliot & Thrash, 2001). Individuals who have a high need to belong may define a goal that targets social aspects of team functioning. Conversely, individuals who have high achievement needs may develop a goal of attaining excellence in relevant performance dimensions. The goals that individuals select will in turn manifest themselves in different behaviors that individuals will exhibit (Dweck & Leggett, 1988). For instance, individuals with a learning goal will demonstrate persistence when faced with negative feedback. These individuals will actively search for ways to improve their competencies to increase their chances of succeeding on the task. Conversely, individuals with a performance goal will be more likely to withdraw their effort in the face of negative feedback and focus on demonstrating their abilities to others (Dweck & Leggett, 1988). Moreover, individuals differ in their efficacy to self-regulate behavior over time (Pintrich, 2000). Some individuals experience high efficacy to calibrate their competencies based on feedback that they received, which in turn helps them to execute actions that further reduce the discrepancy between their current performance levels and goals. Conversely, other individuals experience low self-regulatory efficacy and fail to calibrate their competencies based on feedback, and they perform maladaptive actions as they become caught in a vicious cycle of negative feedback.

However, situations with minimal levels of interdependencies between team members are extremely rare. In fact, one of the defining features of teamwork is high interdependence among team members, which is commonly induced by common team objectives and the task environment.

In such settings, individual behaviors are controlled not only by regulatory processes targeting personal goals, but also by team regulatory processes targeting collective team goals.

### **Interdependent Regulatory Dynamics in Teams**

Optimal team performance requires effective coordination between team members (Rico, Sanchez-Manzanares, Gil, & Gibson, 2008). The central feedback loop in Figure 2 represents a team feedback loop that guides team members' behaviors and collective goal pursuits. Such team regulation takes place via an interconnected feedback loop that is shared by team members. Thus, team members' efforts become entangled such that collective and coordinated team behaviors toward a common goal can be initiated (Kozlowski & Bell, 2003). Interdependent regulatory dynamics encompass the interplay between team members' individual feedback loops and shape the shared team feedback loop.

Proposition 1: Team feedback loop and individual feedback loops influence each other in a reciprocal manner such that

- a. the team feedback loop is influenced by self-regulatory dynamics on the individual level of analysis.
- b. individual feedback loops are influenced by interdependent regulatory dynamics on the team level.

The central feedback loop in Figure 2 indicates that the team feedback loop follows the same sequence as individual feedback loops (DeShon et al., 2004). Team feedback loops constantly compare teams' current performance levels with team goals. Team goals can be assigned from the team leader, or they can be generated spontaneously by team members (Hollensbe & Guthrie, 2000). The discrepancy between current team performance and team goals elicits team members' responses to reduce such discrepancies, such as increasing their efforts and developing different performance strategies. Team members actively plan their strategies and coordinate each other's efforts to increase their chances to attain their team goal. For example, when teams have a learning goal, their efforts will be allocated toward sharing opinions and maximizing the options that the team can pursue (G. Park & DeShon, 2010).

Proposition 2: The team feedback loop follows the same sequence of regulation behaviors that can be observed in individual feedback loops.

Just as individuals differ in their self-regulation, teams also differ in their self-regulation. Teams have different types and levels of needs that they wish to fulfill, which influences the types of goals that they adopt. When teams have a high need for power, they are more likely to set a goal that emphasizes competition with other teams in the organization (Rutte, 1990). Also, teams differ in the effectiveness with which they regulate their behaviors to accomplish team goals. Teams with high reflexivity engage in active reflection of their past performance behaviors, are more effective in developing new strategies, and are more effective in implementing the new strategies appropriately (Gurtner et al., 2007). Team feedback loops are influenced by team design such that different team structures channel different interaction patterns among team members. For instance, in a team with high horizontal interdependence, team members are tightly coupled with each other. This coupling

increases the salience of the team feedback loop because effective coordination among members is important for success.

Proposition 3: Team needs and team design influence interdependent regulatory dynamics such that

- a. team needs that emphasize the relative standing of the group in intergroup comparisons emphasize performance goals, team needs that emphasize the quality of interpersonal relationships between team members emphasize team goals related to team viability and team cohesiveness, and team needs related to uncertainty reduction and need for cognition emphasize learning goals.
- b. team design features will influence interdependent regulatory dynamics in teams such that tight coupling between team members (i.e., high horizontal interdependence and high vertical interdependence) will emphasize the relative strength of the team feedback loop in comparison to the individual feedback loops.

The bold arrows in Figure 2 represent choices that each team member has to make regarding the allocation of resources to the pursuit of individual goals or team goals. Thus, individuals in teams can experience conflict between the two distinct feedback loops for individual and team performance. Emphasizing one goal often leads to decreased effort dedicated to other goals and enlarges performance discrepancies for these goals. For instance, working on team projects deflects attention from making satisfactory progress on individual work assignments. Because individuals have limited resources, individuals in teams often find themselves juggling to regulate their performance in response to individual and team-level feedback loops.

Proposition 4: Individual feedback loops and team feedback loops compete for individuals' resources such that the allocation of effort to individual goals will reduce the effort that will be dedicated to team goals.

Through the interdependent feedback loops system, team members' behavioral choices become connected to each other. The consequences of one team member's behavioral choices have an effect that is spreading through interdependent regulatory dynamics. For instance, one team member's choice to focus on his or her individual goals decreases the overall effort being devoted to team goals, and it increases the pressure on his or her fellow team members to compensate for his or her low effort (Williams & Karau, 1991).

Interdependent feedback loops are constantly updated over time through monitoring activities and coordination among team members. Team members actively monitor each other's input toward team performance to ensure that team members are completing their fair share of the team task (Jacobides & Croson, 2001). Team members reinforce each other's contributions toward team goals by praising and rewarding their teammates' behaviors (Loughry & Tosi, 2008).

Interdependent feedback loops enable team members to assist each other in their progress. When a certain team member is falling behind on his or her progress toward his or her goal, other team members can help to fill the gaps. Such helping behaviors facilitate team members' pursuit of their individual goals and facilitate team members' pursuits of shared team goals by balancing and reallocating their resources effectively (LePine & Van Dyne, 2001; Porter, 2005).

Proposition 5a: Decisions of individual team members to deemphasize team feedback loops and to emphasize individual feedback loops put additional pressure on other team members to maintain the system of interdependent regulatory dynamics in equilibrium in which both individual and team goals can be met.

Proposition 5b: Monitoring and helping behaviors allow teams to balance unequal workload distributions and to maintain the system of interdependent regulatory dynamics in equilibrium such that both individual and team goals can be met.

After a performance cycle, teams receive or inquire feedback that can be given in formal or informal ways (Hollenbeck, Ilgen, LePine, Colquitt, & Hedlund, 1998). Team feedback has implications for team motivational states such as team efficacy and team affect. As such, team outcomes also serve as inputs into team processes in subsequent performance episodes. Negative team feedback decreases team efficacy perception and decreases positive affect, whereas positive team feedback increases efficacy perceptions and reduces negative affect (Lam et al., 2004; Tindale, Kulik, & Scott, 1991). Positive team feedback facilitates upward revision of team goal and negative team feedback facilitates downward revision of team goal (Zander, 1971). Based on the revised team goal, the next performance cycle begins.

Proposition 6: Performance feedback on previous performance episodes influences subsequent interdependent regulatory dynamics such that positive feedback increases team self-efficacy and goal aspirations, whereas negative feedback decreases team efficacy and goal aspirations.

Thus, our model of interdependent regulatory dynamics highlights the interconnected and dynamic processes through which team members coordinate their behaviors in their pursuit of individual and team goals. As team members are working together, their individual regulatory processes become intertwined, which can also lead to individual feedback loops that tend to converge over time. Such convergence is most likely to be seen in cases in which teams exhibit successful team regulation, providing a source of reinforcement for the salience of the interdependent nature of teamwork. Moreover, the convergence in individual feedback loops also increases the salience of team feedback loops, which will now exert a stronger influence on self-regulatory processes. Such processes will ensure that team members understand each other's personal goals and that team goals are shared. Thus, the team develops an interdependent feedback loop system that is updated and that evolves over time at the individual and team levels of analysis.

Proposition 7: Over time, individual feedback loops tend to converge in teams that have demonstrated successful team regulation in previous performance episodes.

### **Future Research and Implications**

Our theoretical model of interdependent regulatory dynamics focuses on dynamic team motivational processes. It describes within-individual resource allocation processes as well as within-team feedback coordination processes that unfold over time. We note that the emphasis on dynamic aspects of team functioning is not new. For example, Marks et al. (2001) developed a multiphase episodic framework to capture team performance episodes over time. Similarly, Kozlowski and Klein (2000) argued that dynamic relationships should be incorporated in multilevel



research. Despite the apparent consensus that more dynamic research models are needed to advance our understanding of team functioning, our review of team motivation research shows that very little empirical research has developed and tested the processes through which team motivation develops and through which it influences team functioning and team performance. The majority of studies relied on direct-consensus or referent-shift consensus models, adopting a fairly static conceptualization of team motivation.

Regulating team motivational states effectively is critical for team success, and future research should examine the processes that lead to the development of interdependent regulatory dynamics in teams. There is still much to be learned about the role of social interaction dynamics for the development of interdependent regulatory dynamics. Social interaction allows team members to influence each other's interpretations of events and enact effective coordinating behaviors through communication (Lam et al., 2004). Thus, team members seek and share their goals with other team members such that team members exert reciprocal influences on the development of shared regulatory dynamics. Also, due to the proximity and frequency of team members' social interactions, team members converge in their goals such that team members strive to reach the same goals (Hassin, Aarts, & Ferguson, 2005). A longitudinal investigation that follows interdependent feedback processes over time as a function of team members' behaviors would provide a much-needed start for a research program that investigates the emergent nature of interdependent regulatory dynamics in teams.

In a related matter, future research needs to develop a richer understanding of dispersion models and their influence on team dynamics. Previous research on team motivation has not endorsed dispersion models in all content areas of team motivation, and the few studies that have ventured into this direction have largely focused on static relationships between motivational dispersion in teams and team outcomes (Gibson et al., 2009; Pieterse et al., 2011). The model of interdependent regulatory dynamics would benefit from studies that also investigate the processes through which dispersion among team members' motivational states influences team coordination processes and team outcomes. For instance, our theory of interdependent regulatory dynamics predicts that having different perceptions of team goals would influence the way in which team members coordinate with each other, which in turn elicits different reactions to team feedback. Such developments are likely to lead to a growing discordance in interdependent regulatory dynamics.

We also encourage additional research on the mechanisms through which feedback on individual and team performance in one performance episode influences interdependent regulatory dynamics in subsequent performance episodes. Until recently, team researchers have conceptualized team behavior with input–process–output (or IPO) models, ignoring the important role that performance outcomes have for subsequent performance episodes (Guzzo & Dickson, 1996). This has changed, however, with recent theoretical models of team behavior that have started to address the motivational implications of performance outcomes for subsequent team motivation (Ilgen et al., 2005; Marks et al., 2001). Most of this work has been theoretical, however, with little empirical research investigating the episodic nature of team functioning over time (DeShon et al., 2004). Thus, we encourage additional empirical research on the feedback loops emanating from past individual and team performance, especially as it pertains to the generation of goals, striving for goals, allocation of resources between individual and team goals, and efficacy perceptions.

Clearly, obtaining access to multilevel data is a challenging endeavor for team researchers. Such challenges can also explain why team motivation research has not made more progress in terms of emphasizing the collective and dynamic character of team motivation. However, there appears to be a silver lining for process-oriented approaches to team motivation. Computational modeling has emerged as a viable complement to traditional research on teams. For example, Ilgen and Hulin (2000) argued that research on teams should take advantage of computational modeling because of its ability to handle a complex set of variables and to reconstruct dynamic interactions among multiple agents, and Vancouver, Weinhardt, and Schmidt (2010) have applied computational modeling to the study of self-regulation processes. They showed that computational modeling allows us to predict individuals' resource allocation processes on multiple feedback loops with remarkable accuracy. They concluded that a combination of computational modeling and traditional empirical studies can enhance our understanding of self-regulatory processes. Applying such models to the team context adds an additional layer of complexity that makes it more difficult to predict regulatory dynamics over time. Nevertheless, given that the application of computational modeling to the field of team motivation is still in its nascent stages, there is hope that this complexity can be addressed. Given the lack of progress on process-oriented perspectives on team motivation in the past decade, we view computational modeling as a promising venue for future work on team motivation.

Our model of interdependent regulatory dynamics highlights the inherent tensions that exist as team members have to regulate their behaviors in response to individual and team feedback loops. Future research should examine the factors affecting the allocation of resources between individual and team goals. Feedback at the individual and team levels facilitates effort expenditure to the respective level of feedback loops (DeShon et al., 2004), and dispositional orientations such as learning goal orientations can influence how individuals allocate their resources between individual and team goals (DeShon et al., 2004). Mitchell et al. (2008) also provided a comprehensive review of factors that influence the choices in a multiple feedback loops environment. They argued that along with the properties of discrepancies and goals, features of the work context, such as task interruption and task characteristics, might influence the extent to which individuals engage in the pursuit of specific goals. Future research should also examine team design and needs and their implications on individual resource allocation decisions in teams.

The model of interdependent regulatory dynamics presents six different content areas of team motivation as ingredients of team regulatory processes. This encourages future research that actively connects different content areas of team motivation. Extant research has largely been conducted within the realms of the different content domains, with little integration between these areas. As a result, some important areas of study have been neglected (i.e., team needs), whereas others remain fragmented (i.e., team regulation). This has prevented us from adopting a richer understanding of team motivation that spans the traditional boundaries of different content domains. We hope that our model of interdependent regulatory dynamics stimulates a wealth of research on team motivation in the next decade, with a particular focus on integrating different traditions of research and on capturing the dynamic and collective character of team motivation.

## **Conclusion**

In this integrative review, we have discussed the extent to which team motivation research has emphasized the dynamic and collective character of team motivation for the six content domains that have attracted the most attention among researchers and that offer the most promise for future research. Our integrative review shows how team motivation research in the six different content domains varies in the extent to which it emphasizes the collective character and the dynamic character of team motivation. Thus, much like a perceptual illusion in which a team or the individual team members can become the figure or the ground, we have discussed examples in which team motivation can be best understood by focusing on the collective property of the team or by focusing on the individual building blocks of team motivation. In summary, we conclude that the move toward more dynamic models of team motivation that capture the multilevel facets of team motivation has been initiated, but that this shift is far from complete. Thus, although the current research adds to the goal of improving our understanding of the nature of team motivation, clearly much more needs to be done.

## **Acknowledgments**

The first two authors appear in alphabetical order. They have contributed equally to this article.

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