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# 5

## *Leadership and Emergent Collective Cognition\**

*Toshio Murase, Christian J. Resick, Miliani Jiménez,  
Elizabeth Sanz, and Leslie A. DeChurch*

*Leadership is ... about the ability to make others feel part of a larger thing. It's part of being able to articulate the social architecture in a way that others can understand, believe in and follow.*

—Kevin Sharer

CEO Amgen (quoted in Bryant, 2009, p. BU2)

Leadership plays a pivotal role in shaping and reshaping the cognitive states that emerge and underpin collective performance. Although both the leadership (e.g., Weick, 1995) and teams (Burke, Stagle, Salas, Pierce, & Kendall, 2006; Randall, Resick, & DeChurch, 2009) literatures have begun to explicitly examine the role of leadership in shaping collective cognition, these two research areas have progressed largely in silos. This chapter develops an integrated framework linking leadership functions to the emergence of collective cognition. We begin by examining the forms of collective cognition that have implications for collective-level success. Next, we propose that six forms of leadership are particularly important facilitators of collective cognition; for each type of leadership, we discuss specific mechanisms that facilitate the emergence of collective cognition and develop propositions intended to stimulate future research. We conclude with a discussion of the practical and theoretical implications.

\* The views expressed in this work are those of the authors and do not necessarily reflect official Army or university policy.

## EMERGENT COLLECTIVE COGNITION

In recent years, team cognition has become an increasingly central focus of team effectiveness research as both theory and empirical evidence underscore the important roles of team mental models and transactive memory systems for effective team performance. However, since Schneider's (1975) seminal paper on organizational climate, researchers have been examining the emergence and implications of team or organizational members' shared perceptions of work environmental factors. A central tenet of this line of theory and inquiry is that the perceptions and knowledge held by individuals emerge to become a property of a team (or even organization) as members interact with one another. These shared perceptions and shared knowledge serve to regulate members' behaviors and enable individual members to function as a unified entity.

Twenty years of team effectiveness research definitively links team cognitive architectures to their performance capacity (DeChurch & Mesmer-Magnus, 2010a). Although the relationship is moderated by specific underpinnings of cognition, DeChurch and Mesmer-Magnus (2010b) found that team cognition contributes uniquely to team performance after controlling for behavioral processes such as coordination and backup behavior (Marks, Mathieu, & Zaccaro, 2001) and motivational states such as cohesion (Gully, Devine, & Whitney, 1995). The field we now describe under the lexicon of team cognition actually grew out of three relatively independent research streams: the first one on shared team mental models (Cannon-Bowers, Salas, & Converse, 1993), the second one on team transactive memory (Liang, Moreland, & Argote, 1995), and the last one on organizational climate (Schneider, 1975).

In reflecting back on the discovery of mental models in teams, Eduardo Salas remarked that, "20 years ago we began a long journey to understand teams and team performance in naturalistic environments ... we were perplexed why some teams under heavy workload could still maintain performance without communicating. Our explanation was—they have a shared understanding of what is going on and what needs to happen; they have a shared mental model" (E. Salas, personal communication, September 8, 2009).

Indeed, since Salas and his colleagues have shown that both conceptual and empirical evidence support the idea of *emerging alike* in integrated teams.

At around the same time, research on team transactive memory systems and shared memory in teams (Liang, Moreland, & Argote, & Krishnan, 1999) showed that a set of knowledge relevant to the team, shared by members, coupled with a shared understanding of knowledge. Through the sharing of information, teams have shown that team members specialize in particular areas of work; essentially, this is a form of team (Hinsz, Tindale, & Riegler, 2003). It has been empirically linked to team performance. Team members to have better coordination and communication. Individual members are able to use their specific expertise, and also to share it (Lewis, 2003).

Team climate is the perception of the environment shared among team members. It is a result of interaction with the environment (Lewin, 2000). The team climate literature has shown that team-level perceptions and behaviors emphasize such as service quality (Ehrhart, Mayer, Saltz, & Spector, 2002).

Although these research streams have shown they offer diagnostic and prescriptive insights into the construct, team cognition, the literature suggests that teams use "to manage their internal and external environments" (Rentschler, 2003). Analytic integration synthesis of these research streams on various emergent phenomena (Magnus, 2010b) in terms of team cognition: nature of emergent phenomena. Of the three, the nature of the relationships between shared

Indeed, since Salas and colleagues' original observations, a deluge of both conceptual and empirical research has investigated the role of *thinking alike* in integrated team performance.

At around the same time, Moreland and colleagues were developing the team transactive memory concept—an extension of Wegner's 1986 notion of shared memory in romantic couples (Liang et al., 1995; Moreland, Argote, & Krishnan, 1996). Transactive memory consists of a differentiated set of knowledge relevant to the team's task that is distributed across team members, coupled with an understanding of who possesses particular sets of knowledge. Through this collective system for encoding and retrieving information, teams have access to a large body of information because members specialize in particular subsets of information needed for team-work; essentially, this increases the information-processing capacity of the team (Hinsz, Tindale, & Vollrath, 1997). Team transactive memory has been empirically linked to better team processes by allowing team members to have better coordination, reducing the amount of information that individual members are responsible for by knowing which members have specific expertise, and aiding in the sharing of task-relevant information (Lewis, 2003).

Team climate is the perception about the group environment that is shared among team members and develops through socialization and interaction with the environment and one another (Lindell & Brandt, 2000). The team climate literature has demonstrated relationships between team-level perceptions and specific behaviors that those perceptions emphasize such as service-oriented and safety behavior (e.g., Schneider, Ehrhart, Mayer, Saltz, & Niles-Jolly, 2005; Zohar & Luria, 2004).

Although these research streams developed somewhat independently, they offer diagnostic and predictive capability in teams. As an integrated construct, team cognition encompasses various arrangements of knowledge that teams use "to make sense of, attribute meaning to, and interpret internal and external events, including affect, behavior, and thoughts of self and others" (Rentsch, Small, & Hanges, 2008, p. 144). A recent meta-analytic integration synthesized these previously disjointed research streams on various emergent cognitive constructs (DeChurch & Mesmer-Magnus, 2010b) in terms of three meaningful underpinnings of team cognition: nature of emergence, form of cognition, and content of cognition. Of the three, the nature of emergence was the most critical moderator of relationships between shared cognition and team performance.

### Nature of Emergence

Team cognition originates in team members' (i.e., individual-level) patterned knowledge. In this way, it can be characterized as a bottom-up emergent construct, where new meaning is present at the team level beyond what was apparent in the individual-level cognitive content (Kozlowski & Klein, 2000). Kozlowski and Klein (2000) distinguish different forms of emergence according to the extent to which the higher level emergent construct is different, nonisomorphic in form and function, and patterned in comparison to the individual or lower level content from which it originates. The nature of emergence is a critical distinction between team mental model research and transactive memory research. In essence, these two approaches to the study of team cognition represent different types of emergence. The team mental model concept represents compositional emergence; here, the structure of cognition at the individual level is similar in form to the structured arrangement of cognition examined at the team level. In contrast, team transactive memory represents compilational emergence; the knowledge held by individuals is not patterned in the same way as it is at the team level. The team transactive memory system is composed of individuals' knowledge sets, but the meaningful team-level construct reflects the patterned, differentiated knowledge.

Composition variables are often aggregated using the sum or average of the components from each individual, with researchers justifying the aggregation of such scores due to high interrater agreement indices (Klein & Kozlowski, 2000). This type of emergence has been criticized as having "limited the development of bottom-up multilevel theory and research" (Kozlowski & Klein, 2000, p. 5). In contrast, compilation variables are different at higher levels of analysis than at lower levels of analysis (i.e., individual level). Compilation variables arise from the pattern of cognition among members rather than a simple aggregate. The components of cognition serve the same purpose at each level; however, they are not the same in pattern. Compilation variables are often aggregated using the distribution of component scores, such as the variance of individual scores for a particular component. Importantly, the meta-analytic study by DeChurch and Mesmer-Magnus (2010a) found stronger relationships between cognition and team behavioral processes and performance when cognition was measured as compilational emergence as compared to compositional emergence.

### Form of Cognition

Rentsch et al. (2008) posit that team cognition can be classified: perceptual and structured. Most of the literature to date has focused on perceptual cognition (DeChurch & Mesmer-Magnus, 2010b, p. 12; Rentsch et al., 2008). The nature of perceptual cognition is that it does not differ among different constructs. It is more of a reaction to stimuli. An example of perceptual cognition is the measured climate as a composition of shared perceptions. It is the realization of the value of compilation through the patterning of shared perceptions and strength of relationships (Rentsch et al., 2006; Lindell & Brandt, 2006). Other examples of perceptual cognition are Walumbwa & Schaubroeck, (2002; Iun, 2006).

Structured cognition has been defined as information that is represented by the patterned arrangement of knowledge or cognition that provides information on cognitive structures. It is the arrangement of local pieces of information and relationships in a sense of situations and stimuli. It is the architecture (Rentsch et al., 2008) that would be team mental model. It is the architecture (Rentsch et al., 2008; Cannon-Bowers, 2000) and the architecture (Rentsch et al., 2003; Lewis, 2003). A recent study by Rentsch et al. (2008) revealed that structured cognition processes are more effective than perceptual cognition processes and structured cognition w

### Form of Cognition

Rentsch et al. (2008) posited that there are three categories in which cognition can be classified: perceptual, structured, and interpretive. Although most of the literature to date has examined perceptual and structured cognition (DeChurch & Mesmer-Magnus, 2010b), each form of cognition adds to our understanding of how teams function in dynamic environments.

Focus on team members' beliefs, values, attitudes, perceptions, and expectations is referred to as perceptual cognition. This form of cognition draws from team members' past experiences/observations as the basis for such knowledge construction and is shaped through interactions with one's team members and environment (DeChurch & Mesmer-Magnus, 2010b, p. 12; Rentsch et al., 2008). However, a shortcoming of perceptual cognition is that it does not allow researchers to examine relationships among different constructs (i.e., structure) because perceptual cognition is more of a reaction to stimuli (e.g., event, person, entity). Climate is an example of perceptual cognition. Although most extant research has measured climate as a compositional variable, researchers are beginning to realize the value of compilational variables, and more research examining the patterning of shared perceptions is focusing largely on the direction of perceptions and strength of perceptions (e.g., Dickson, Resick, & Hanges, 2006; Lindell & Brandt, 2000; Schneider, Salvaggio, & Subirats, 2002). Other examples of perceptual cognition include psychological safety (e.g., Walumbwa & Schaubroeck, 2009) and perceived similarity (e.g., Huang & Lun, 2006).

Structured cognition has an underlying organizational scheme and is represented by the patterning of knowledge organization, which provides information on cognitive linkages. Schemas are a type of structured knowledge or cognition that direct an individual's attention toward critical pieces of information and enhance an individual's ability to make sense of situations and stimuli based on previously developed mental architectures (Rentsch et al., 2008). Examples of structured cognition would be team mental models (e.g., Mathieu, Heffner, Goodwin, Salas, & Cannon-Bowers, 2000) and transactive memory systems (e.g., Austin, 2003; Lewis, 2003). A recent meta-analysis of team mental model studies revealed that structured cognition is more predictive of teamwork processes than perceptual cognition; however, both perceptual cognition and structured cognition were equally predictive of team performance

(DeChurch & Mesmer-Magnus, 2010b). DeChurch and Mesmer-Magnus (2010b) also found that cognitive congruence exhibited a stronger relationship with processes when the form of cognition was structured rather than perceptual; however, this relationship was reversed when cognitive accuracy was assessed rather than cognitive congruence, and therefore, perceptual cognition was the condition in which the cognition-process relationship was the strongest.

Interpretive cognition serves to make meaning or sense of the environment or situation. Interpretive cognition uses individuals' past experiences to construct meaning to current experiences through the interaction of the current environment and individuals (along with one's past experiences). As previously mentioned, most research has been conducted on the aforementioned forms of cognition. Rentsch et al. (2008) use sensemaking and collective learning as two examples of interpretive cognition. Sensemaking is the process in which group members create an agreed upon explanation or logical rationale for current or past events (e.g., Fiss & Zajac, 2006). Previous studies have found that all three forms of cognition have been linked to various types of outcomes, such as affective/motivational (Meglino, Ravlin, & Adkins, 1989), behavioral (Zohar & Luria, 2004), and objective (Schneider et al., 2005).

### Content of Cognition

When Cannon-Bowers et al. (1993) first proposed the content areas for mental models, they posited that there are four content domains for cognition: knowledge of the task, team interactions (teamwork), equipment, and knowledge regarding teammates. Mathieu et al. (2000) suggested that these four categories could be condensed into two: team focused and task focused.

Team-focused content refers to knowledge of one's team members' roles, skills, expertise, preferences, and social interaction norms within one's team. Team knowledge allows members to interpret behavior from their teammates in a similar manner and behave in ways that are consistent with group expectations, thereby shaping both one's own behavior and the interpretation/reaction to others' behavior (Mathieu et al., 2000). The second content of cognition, task-focused content, refers to knowledge regarding the task that is being performed (often can be ascertained through a job or task analysis). Task content includes knowledge about

task procedures, if-then rules, and task component relationships. Content knowledge is critical to change.

A third content of cognition in recent years. Strategic shared understanding of the middle, and/or operating procedures (Lechner, & Floyd, 2005, p. 10) to the strategies that are used on strategic content has been found in teams. Research has found that plans and goals important in driving behind such plans is related to the overall plan while (Kellermanns et al., 2005) Randall et al. (2009) found that strategic mental models brings us to the effects of cognitive processes, which have been

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### COGNITION, LEADERSHIP

The effectiveness of collective performance involving performance outcomes, and beliefs such as team trust (2006; Sundstrom, DeMuir, & Campion, 2006) team effectiveness is the ability of a team in accomplishing its goals. In addition to team effort, back each other up, and also important indicators of team performance (2006; Sundstrom et al., 2006) relationships between communication (Day, Arthur, & Bell, 2006; Dickson, Mitchelson, Allen, & Campion, 2006) tive cognition (e.g., Austin, 2006)



task procedures, if-then scenarios, task strategies, task-relevant situations, and task component relationships. As noted by Mathieu et al. (2000), task content knowledge is critical when tasks are dynamic and are susceptible to change.

A third content of cognition, strategic, has been receiving more attention in recent years. Strategic cognition, or strategic consensus, is "the shared understanding of strategic priorities among managers at the top, middle, and/or operating levels of the organization" (Kellermanns, Walter, Lechner, & Floyd, 2005, p. 721). Said another way, strategic consensus refers to the strategies that are to be enacted to reach the team's goal. Research on strategic content has typically been performed using top management teams. Research has found that not only is a shared understanding of the plans and goals important, but also a shared understanding of the reasoning behind such plans is needed in order for managers to act according to the overall plan while not directly in contact with upper management (Kellermanns et al., 2005). Furthermore, among knowledge-based teams, Randall et al. (2009) found that both the similarity and accuracy of team strategic mental models were predictive of adaptive performance. This brings us to the effects of collective cognition on outcomes beyond team processes, which have been previously noted.

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## COGNITION, LEADERSHIP, AND EFFECTIVENESS

The effectiveness of collectives is a complex, multidimensional construct involving performance outcomes, behavioral processes such as adaptability, and beliefs such as team satisfaction or viability (Kozlowski & Ilgen, 2006; Sundstrom, DeMuse, & Futrell, 1990). One important indicator of team effectiveness is the extent to which the team is successful at accomplishing its goals. In addition, the team's ability to successfully coordinate efforts, back each other up, and remain a viable entity in the future are also important indicators of collective effectiveness (Kozlowski & Ilgen, 2006; Sundstrom et al., 1990). A number of studies have examined the relationships between compositional collective cognition (e.g., Edwards, Day, Arthur, & Bell, 2006; Marks, Sabella, Burke, & Zaccaro, 2002; Resick, Dickson, Mitchelson, Allison, & Clark, 2010) and compilational collective cognition (e.g., Austin, 2003; Lewis, 2003; Zhang, Hempel, Han, &

Tjosvold, 2007). DeChurch and Mesmer-Magnus (2010a) meta-analyzed effects of compilational and compositional forms on team performance and found evidence that collective cognition is strongly related to both subjective and objective types of performance indicators. Overall coefficients of compositional and compilational emergence are .26 and .42 for objective performance and .42 and .50 for subjective performance, respectively. These relationships are moderated by different factors such as study setting, team types, and interdependence levels.

To understand teamwork, scholars have been searching for factors that influence teamwork through collective cognition. Among many, leadership has been theorized and identified to influence both collective cognition and team functioning (Zaccaro, Rittman, & Marks, 2001). However, the recent trend in the leadership literature was found to be more focused on leadership effects on dyadic relationships than collective process (Kaiser, Hogan, & Craig, 2008). For years, leadership scholars have defined leadership as the process of influencing collective action in order to achieve a collective goal (Stogdill, 1950). There has not been alignment between theoretical interests of the field and accumulated knowledge. Research on understanding how leadership influences team effectiveness through collective cognition is still an underresearched but promising area.

## COGNITIVE ASPECTS OF LEADERSHIP THEORIES

Although numerous leadership theories and approaches submit that leaders influence collective perception and similar cognitive constructions, research on leadership has not yet fully incorporated the advances of team cognition in their empirical inquiry. The next section delves into the five approaches to leadership that have strong theoretical connections to emergent collective cognition. Table 5.1 summarizes the leadership literature and distinct cognitive aspects of the five major theories discussed in the following section.

### Behavioral Perspectives

Seminal studies of leadership were conducted by researchers at Ohio State University and University of Michigan, separately, that identified

**TABLE 5.1**

Cognitive Aspects of Five Major

#### Forms of Leadership

##### Behavioral

Behavior is more broadly defined than the Ohio State University two-factor model. Yukl (2002) identifies 12 behavioral dimensions and Fleishman et al. (1991) identify 13 dimensions.

##### Strategic

Encompasses the top executives of organizations and the top management team whose aim is to influence organizational outcomes.

##### Transformational

Leaders inspire followers to transcend their self-interest and increase their awareness in valued outcomes by engaging in charismatic leadership, individual consideration, and intellectual stimulation (Bass, 1985).

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ducted by researchers at Ohio igan, separately, that identified

**TABLE 5.1**

Cognitive Aspects of Five Major Approaches to Organizational Leadership

Forms of Leadership	Forms of Cognition Contained in Theory	Summary of Prior Findings
<b>Behavioral</b>		
Behavior is more broadly defined than the Ohio State University two-factor model. Yukl (2002) identifies 12 behavioral dimensions and Fleishman et al. (1991) identify 13 dimensions.	Specific behavioral dimensions influence different types of cognition development such as mental models, team norm, and role ambiguity.	Schneider, Ehrhart, Mayer, Sultz, and Niles-Jolly (2005) found a link between leader behavior emphasizing service climate and staff service-oriented climate. DeChurch, Marks, and Murase (2009) found that leader strategy and coordinating behavior impacted mental model similarity in multiteam systems.
<b>Strategic</b>		
Encompasses the top executives of organizations and the top management team whose aim is to influence organizational outcomes.	Strategic leadership facilitates followers' identification with a collective level and development of understanding of critical issues among subsystems.	Fiss and Zajac (2006) found that leader sensemaking influenced cognitive frameworks. Walumbwa and Schaubroeck (2009) found that strategic leader ethical leadership influenced the development of psychological safety. Randall, Resick, and DeChurch (2009) found that external leader sensegiving influenced team strategy-focused mental model similarity and accuracy.
<b>Transformational</b>		
Leaders inspire followers to transcend their self-interest and increase their awareness in valued outcomes by engaging in charismatic leadership, individual consideration, and intellectual stimulation (Bass, 1985).	Transformational leaders encourage followers to self-identify with the task and collective goals and share vision.	Schippers, Den Hartog, Koopman, and van Knippenberg (2008) found that transformational leadership was related to the formation of a shared vision.

*continued*

**TABLE 5.1 (CONTINUED)**

Cognitive Aspects of Five Major Approaches to Organizational Leadership

Forms of Leadership	Forms of Cognition Contained in Theory	Summary of Prior Findings
<p><b>Functional</b> It is the function of the leader "to do, or get done, whatever is not being adequately handled for group needs" (McGrath, 1962, p. 5).</p>	<p>Functional leadership entails the cognitive leadership process of surveying group conditions and information to design plans and consistently negotiate group conditions (Kane, Zaccaro, Tremble, &amp; Masuda, 2002).</p>	<p>Kearney and Gebert (2009) found that transformational leadership influenced collective team identification. Resick, Whitman, Weingarden, and Hiller (2009) found that chief executive officer transformational leadership was related to the performance of core teams within the firm.</p>
<p><b>Shared Team Leadership</b> Involves the process by which all members of a team engage as the leader of the team (Gronn, 2002; Pearce &amp; Conger, 2003; Pearce, Manz &amp; Sims, 2008)</p>	<p>Team members need to have some form of shared understanding/consensus of their fellow team members' specialized expertise. It is through this shared understanding of each other's expertise that team members will be willing to trust a team member who takes on the leader role during a task.</p>	<p>Marks, Zaccaro, and Mathieu (2000) found that leader briefings influenced the accuracy and similarity of team members' mental models.</p> <p>Hiller, Day, and Vance (2006) found that shared leadership influenced collectivism attitudes.</p>

two dimensions of leader behavior termed Initiating Structure (University of Michigan, they shows support and acceptance which indicates behavior aimed dimensions of leader behavior nizational outcomes including nizational performance, subor Aditya, 1997; Judge, Piccolo, &

Also influential in the domain specifying more narrowly def 2002). Yukl et al. (2002) have dimensions, and Fleishman et ries. Both the Yukl et al. (2002 include behaviors that guide f and develop a similar cognitive describe three behaviors that s ning and organization, clarify Similarly, Fleishman et al. (1991 behaviors: planning and coord These behavioral categories are ing followers' cognition. In tu cognitive variables that make t ership behaviors.

Role clarification is defined up goals (Yukl, 2002). Planni objectives, priorities, assignme of activities (Yukl, 2002). Once actions, they must develop a (Morse & Wagner, 1978). Lea stand their unique function ar directions, they can exert ener However, leaders must coordin cialties. In planning, members in what functions and how the different points. Recognition o memory because in a planning unique role and how they are co

Organizational Leadership

**Summary of Prior Findings**

Kearney and Gebert (2009) found that transformational leadership influenced collective team identification. Resick, Whitman, Weingarden, and Hiller (2009) found that chief executive officer transformational leadership was related to the performance of core teams within the firm.

Marks, Zaccaro, and Mathieu (2000) found that leader briefings influenced the accuracy and similarity of team members' mental models.

Hiller, Day, and Vance (2006) found that shared leadership influenced collectivism attitudes.

two dimensions of leader behavior. At Ohio State, these dimensions were termed Initiating Structure (IS) and Consideration (C), whereas at the University of Michigan, they were termed relationship oriented, which shows support and acceptance of subordinates, versus task oriented, which indicates behavior aimed at attainment of the group's goal. These dimensions of leader behavior are positively linked to many valued organizational outcomes including subordinate performance, group and organizational performance, subordinate job attitudes, and turnover (House & Aditya, 1997; Judge, Piccolo, & Ilies, 2004).

Also influential in the domain of leader behavior are taxonomic efforts specifying more narrowly defined behaviors (Yukl, Gordon, & Taber, 2002). Yukl et al. (2002) have proposed a taxonomy of 12 behavioral dimensions, and Fleishman et al. (1991) developed 13 behavioral categories. Both the Yukl et al. (2002) and Fleishman et al. (1991) taxonomies include behaviors that guide followers to understand the environment and develop a similar cognitive schema. In particular, Yukl et al. (2002) describe three behaviors that should promote collective cognition: planning and organization, clarifying roles and objectives, and informing. Similarly, Fleishman et al. (1991) include two emergent cognition-relevant behaviors: planning and coordinating and communicating information. These behavioral categories are directly aimed at influencing and changing followers' cognition. In turn, the teams literature provides various cognitive variables that make theoretically sound linkages to those leadership behaviors.

Role clarification is defined as specifying responsibilities and setting up goals (Yukl, 2002). Planning is defined as making decisions about objectives, priorities, assignments of responsibilities, and coordination of activities (Yukl, 2002). Once leaders have identified separate, distinct actions, they must develop a plan that considers timely coordination (Morse & Wagner, 1978). Leaders and members must clearly understand their unique function and contribution to the team. With clear directions, they can exert energy on information critical to their roles. However, leaders must coordinate such individuals with different specialties. In planning, members recognize which members are specialized in what functions and how they should coordinate with one another at different points. Recognition of interdependence improves transactive memory because in a planning process, members must understand each unique role and how they are connected to accomplish a mission (Zhang

et al., 2007). In addition, leaders must manage information internal and external to the team. Identifying and relaying appropriate information to members enhances coordination timing and members' unique roles. As the environment changes, leaders need to update their agenda and develop a new coordination plan. As they adjust their plans, leaders must engage in communication with members to alter their collective cognitions and make them fit the changing environment (Morgeson, 2005). Leaders must allocate information to the right members based on their responsibilities to avoid having members cognitively overloaded (Littlepage, Hollingshead, Drake, & Littlepage, 2008). As members obtain unique information that may not be shared with others, their cognitive schema will be altered. These three leader behaviors interact with each other to create conversion and differentiation in members' knowledge at the team level.

*Proposition 1: Team leader planning behavior positively influences team members' development of task-, team-, and strategy-focused compositional forms of emergent cognition.*

*Proposition 2: Team leader role clarification behavior positively influences team members' development of compilational forms of emergent cognition.*

*Proposition 3: Team leader informational communication behavior positively influences team members' development of task-, team-, and strategy-focused compositional forms of emergent cognition.*

### Strategic Leadership

Understanding the impact of strategic leadership is a core goal of organizational science research because senior executives can and do have a company-wide impact and mistakes can lead to catastrophic consequences. Strategic leadership theory and research focus on individuals at the apex of an organization, and topics can range widely from traits to behaviors to even the succession process (e.g., Jensen & Zajac, 2004; Nutt, 1987; Tushman & Rosenkopf, 1996). Upper echelon theory and an argument for legitimizing the use of observed data of executives' traits by Hambrick and Mason (1984) have spawned many studies that explore how top managers' traits influence their actions. Researchers have found empirical evidence that the characteristics and actions of strategic leaders

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are related to more distal outcomes such as firm strategy and performance, as well as the relationships with and the performance of teams within the organization (e.g., Chatterjee & Hambrick, 2007; Peterson, Smith, Martorana, & Owens, 2003; Resick, Whitman, Weingarden, & Hiller, 2009).

Strategic leaders must coordinate actions and effort from multiple constituents at multiple layers to attain organizational outcomes (Lord, 2001). Formulating effective strategies is important but not sufficient. Constructing a collective mental schema is equally as necessary for any collective action. Cognitive diversity influences effectiveness of strategy at least in two stages. First, members at the top have diverse functions, which lend them different lenses to view the business world and make them focus on different parts of information. Studies show that cognitive diversity among top managers inhibits development of comprehensive and extensive strategic planning (Miller, Burke, & Glick, 1998). In addition, companies with well-developed strategies sometimes face negative consequences if they cannot implement them. Middle and first-line managers must understand the meaning of strategies in order to implement them at the operational levels (Balogun & Johnson, 2004). Thus, the main function of strategic leadership is to develop similar, collective cognition among constituents at different levels and cultivate support for strategies. Executives must provide a vision and framework (Balogun & Johnson, 2004; Fiss & Zajac, 2006; Rapert, Velliquette, & Garretson, 2002) and cultivate collective identity (Lord & Brown, 2001; Shamir, House, & Arthur, 1993) to maintain and orchestrate subsystems while institutionalizing new policies and regulations and developing adapting structures to dynamic environments (Bernard, 1938).

Sensegiving and development of culture have been found to be important mechanisms that enhance convergence of individual cognitive schema on critical issues. Executives' vertical communication with top middle managers allows them to be involved in strategic planning, enhances convergence of their cognitive schema with top managers, and improves the understanding of priorities (Rapert et al., 2002; Wooldridge & Floyd, 1990). Executive leaders also use culture as a vehicle to develop and maintain certain collective cognitive patterns in their organizations (Giberson et al., 2009; Schein, 2004).

A culture is a set of socially constructed rules and values shared by members that determines thought process, perceptions, and behaviors

(Schein, 2004). Several recent studies have shown that leaders play a critical role in developing and changing culture (Giberson et al., 2009; Schneider et al., 2005). Executive leaders use culture as a tool to send signals as to their emphasis on certain values and to integrate individual different schemas into a unified one (Grojean, Resick, Dickson, & Smith, 2004; Zohar & Luria, 2004). For example, members in an organization use the culture as a standard to judge whether behaviors or their values are appropriate. It is a powerful tool that influences collective cognition and behavior (Mayer, Kuenzi, Greenbaum, Bardes, & Salvador, 2009; Salvaggio et al., 2007). Through these mechanisms, executive leaders enhance the convergence of collective cognitive schema at the organization level.

*Proposition 4: Strategic leader sensegiving behavior positively influences team members' strategy-focused compositional and perceptual forms of emergent cognition.*

### Transformational Leadership Theory

In proposing transformational leadership (TL) theory, Bass (1985) suggested that transformational leaders incite followers to transcend their self-interest and increase their awareness of valued outcomes by engaging in four types of behaviors: idealized influence, inspirational motivation, intellectual stimulation, and individual consideration (Bass & Avolio, 1993). Within the literature, both idealized influences and inspirational motivation are combined to create what is known as charismatic leadership or a leader's ability to provide followers with a strong vision of the future. Individual consideration focuses on a leader's ability to attend to the unique developmental needs of followers. Lastly, intellectual stimulation involves leaders encouraging followers to think *outside the box* and challenge organizational norms (Bass, 1985; Bono & Judge, 2004).

Research on leaders who exhibit TL behaviors has found that followers are more aware of organizational goals (Berson & Avolio, 2004) and share similar views on the importance of goals (Colbert, Kristof-Brown, Bradley, & Murray, 2008). The effects of TL go beyond individual influence as recent studies have begun to focus on the effects of TL behaviors on collective cognition. For instance, leaders who engage in TL behaviors have

the ability to influence collective cognition (Berson & Avolio, 2009) and unit climate by network (Gazit, 2008). Schippers, Den Hartog, & van Knippenberg (2008) and Jansen, George, Van Knippenberg, & van Veen (2008) found that leaders who engaged in TL behaviors had a greater shared vision. Furthermore, behavioral research on military officers has been found to impact collective cognition in their organizations (Resick et al., 2004). Research on strategic leadership may have a cascading effect on collective cognition teams throughout the firm.

Although many studies have found that transformational behaviors that promote team outcomes, the extent to which leaders' collective cognition has yet to be fully understood encompasses followers adopting a shared vision, it does not fully encompass the more commonly studied TL behaviors. Transformational leadership and create a shared vision among followers simply implies that a leader persuades followers with his or her vision, but it does not measure the degree of agreement between leaders and followers as the degree of agreement between leaders and followers adopt is accurate. Future research on transformational behaviors have on collective cognition and team performance. Leaders who inspire a shared vision among followers have on collective cognition.

*Proposition 5: TL behaviors positively influence team members' strategy-focused compositional forms of emergent cognition.*

### Functional Leadership Theory

Functional leadership has been defined as a leadership style and often neglected in the traditional literature (Walumbwa, & Weber, 2009; Howell & Hannah, 2008). Functional leadership is a leadership approach that fulfill team needs in order to achieve organizational goals. Leadership definitions focusing on work-related behaviors (Zaccaro et al., 2001). Unlike traditional leadership, functional leadership can be fulfilled by any member who



have shown that leaders play a significant role in shaping organizational culture (Giberson et al., 2009). Leaders use culture as a tool to send values and to integrate individual roles. For example, Resick, Dickson, & Smith (2008) found that leaders' behaviors and their values significantly influence collective cognition. Similarly, Baum, Bardes, & Salvador (2009) identified mechanisms by which executive leaders influence cognitive schema at the organiza-

*...ing behavior positively influences compositional and perceptual forms*

...ry  
 ship (TL) theory, Bass (1985) suggests that leaders can inspire followers to transcend their self-interest for the sake of valued outcomes by engaging in transformational leadership. Transformational leadership is characterized by idealized influence, inspirational motivation, individualized consideration (Bass & Avolio, 1997), and intellectual stimulation, both idealized influences and behaviors that are used to create what is known as charismatic leadership. Transformational leadership focuses on a leader's ability to meet the developmental needs of followers. Lastly, transformational leadership encourages followers to think beyond organizational norms (Bass, 1985; Bono &

... behaviors has found that transformational leadership behaviors (Berson & Avolio, 2004) and transformational leadership behaviors (Colbert, Kristof-Brown, & Bass, 2005) go beyond individual influence to have significant effects on collective cognition. Leaders who engage in TL behaviors have

the ability to influence collective team identification (Kearney & Gebert, 2009) and unit climate by networking among followers (Zohar & Tenne-Gazit, 2008). Schippers, Den Hartog, Koopman, and van Knippenberg (2008) and Jansen, George, Van den Bosch, and Volberda (2008) found that leaders who engaged in TL behaviors had followers with similar team identification. Furthermore, because transformational chief executive officers have been found to impact the performance of core teams within their organizations (Resick et al., 2009), TL behaviors exhibited by strategic leaders may have a cascading effect on leadership at lower levels and teams throughout the firm.

Although many studies have looked at the mechanisms leaders influence that promote team outcomes, the linkage between TL and followers' collective cognition has yet to be investigated. Although shared vision encompasses followers adopting a leader's vision and working toward that vision, it does not fully encompass collective cognitive processes. One of the more commonly studied TL behaviors is the ability for TL to influence and create a shared vision among followers. We argue that shared vision simply implies that a leader persuades or encourages the follower to agree with his or her vision, but it does not incorporate important aspects such as the degree of agreement between followers or whether the vision followers adopt is accurate. Future research should focus on the impact TL behaviors have on collective cognition and, more specifically, on how leaders who inspire a shared vision among followers can help teams develop collective cognition.

*Proposition 5: TL behaviors positively influence team members' strategy-focused compositional forms of emergent cognition.*

### Functional Leadership Theory

Functional leadership has been developed uniquely in the teams literature and often neglected in the traditional leadership literature (e.g., Avolio, Walumbwa, & Weber, 2009; House & Aditya, 1997). The main distinction from other leadership approaches is its focus on leadership behaviors that fulfill team needs in order to attain goals instead of traditional leadership definitions focusing on what leaders should do (Morgeson, 2005; Zaccaro et al., 2001). Unlike traditional models of leadership, this role can be fulfilled by any member who is capable of executing requirements for

the team function (Lord, 1977; Morgeson, Lindoerfer, & Loring, 2009). Relative to the other leadership approaches, the literature is still scant. More research is necessary to fully understand what behaviors functional leaders engage in and how members occupy this role or share it.

Researchers have proposed different models that indicate linkages to collective cognitive processes. Lord (1977) has proposed 13 behavioral dimensions for task-related and socioemotionally related behavior, and Morgeson et al. (2009) have identified 13 behavioral dimensions based on the team taxonomy of Marks et al. (2001), whereas Zaccaro et al. (2001) have used Fleishman et al.'s (1991) 13 behavioral dimensions to explain linkages to collective cognition. Among these models, we find substantial overlap of distinct functional behaviors that can be linked to collective cognition. They recognize the importance of planning and sensegiving and identification of problems and needs. Zaccaro et al. (2001) have explicitly delineated theoretical linkages between these behaviors and team cognitive processes such as shared mental models, collective information sharing, and team metacognition. Other research suggests that functional leadership leads to enhanced convergence on collective cognition (Marks, Zaccaro, & Mathieu, 2000; Morgeson et al., 2009).

Studies have supported the effect of functional leadership on collective cognition. Mission analysis provides a main framework within which members form expectations, priorities, and tasks. Identification with leaders makes members accept the same understanding of strategy and priorities. Like other leadership approaches, sensemaking behavior and the leader exchanging information with followers process help develop similar understanding of priorities (Donnellon, Gray, & Bougon, 1986; Morgeson, 2005). The teams literature has provided empirical support for direct effect of leader's behaviors on collective cognition. Because members have unique cognitive schema due to their functional training and experiences, it is important for them to construct a similar mental model that guides the coordination of their actions effectively (Mathieu et al., 2000). Leader briefing behavior has been found to influence the development of shared mental models in teams and multiple teams (DeChurch, Marks, & Murase, 2009; Marks et al., 2000). In addition, teams must work as a unified entity in a dynamic environment. As the environment changes, they must change their patterns of coordination and adapt (Harrison, Mohammed, McGrath, Florey, & Vanderstoep,

2003). Thus, leaders must be able to clarify any confusion about the team's mental change and develop a shared understanding (Lant & Hewlin, 2002). With this understanding, they can all share to integrate the team cannot function (Morgeson, 2005). Sensegiving has been found to be a key to the accuracy of strategic mental models, which teams adapt to a dynamic environment. Because functional leadership helps to satisfy team needs (Morgeson et al., 2009), it is important for the theoretical linkages of functional leadership approach. Functional leadership helps team members and show important behaviors by engaging in role clarification.

*Proposition 6: Team leaders involving (a) mission analysis, (b) influence team members, (c) focused compositional forms of emergent cognition.*

### **Shared and Distributed Leadership**

With the prevalence of work teams, different forms of leadership have become common beyond the conventional view of a leader by a more established team. Shared leadership is viewed in terms of a collective take on or transfer of leadership order to take advantage of each member's strengths for the overall team goal (Burke, 2006; Pearce & Conger, 2002). In multiple team members is based on the needs of the team at a specific time. In other words, the leadership is shared as the member's expertise contributes to the team's needs. A member "steps up" and takes on the leadership role.

2003). Thus, leaders must continuously schedule meetings where they can clarify any confusion about member roles that arises due to environmental change and develop a new strategic plan to facilitate coordination (Lant & Hewlin, 2002). Without a central member giving a framework that they can all share to interpret the environment in a similar manner, the team cannot function (Marks et al., 2000; Morgeson, 2005). Leader sensegiving has been found to positively influence the similarity and accuracy of strategic mental models, which in turn influence the extent to which teams adapt to a dynamic environment (Randall et al., 2009). Because functional leadership is defined in terms of behaviors that satisfy team needs (Morgeson et al., 2009), sources of empirical supports for the theoretical linkages overlap with those for the behavioral leadership approach. Functional leadership must differentiate specialty across members and show important issues on which members have consensus by engaging in role clarification and planning.

*Proposition 6: Team leaders who engage in functional leadership behaviors involving (a) mission briefings, and (b) team preparation positively influence team members' development of task-, team-, and strategy-focused compositional forms of emergent cognition and compilational forms of emergent cognition.*

### Shared and Distributed Leadership

With the prevalence of work teams in organizations, nontraditional forms of leadership have become commonplace. These forms of leadership go beyond the conventional view that a single member of a team is appointed as a leader by a more established member of the organization. For instance, shared leadership is viewed in team settings where multiple members of a collective take on or transfer the "leader" role among team members in order to take advantage of each member's strengths in an effort to attain the overall team goal (Burke, Fiore, & Salas, 2003; Hiller, Day, & Vance, 2006; Pearce & Conger, 2002). In shared leadership, the empowerment of multiple team members is based on expertise relevance and context. In other words, the leadership is disseminated between members based on the needs of the team at a specific time in its life cycle. Thus, when a team member's expertise contributes to the overall team goal, that individual "steps up" and takes on the leadership role. Similar to shared leadership is

distributed leadership, which acknowledges that leadership is composed of a collection of behaviors that can be rotated among the members of the group (Barry, 1991; Erez, LePine, & Elms, 2002). Distributed leadership does not require a member to emerge based on the expertise he or she possesses and how it contributes to the team goal. Instead, distributed leadership occurs when the team members dispose of it. It can come about when the existing leader is overwhelmed with his or her responsibilities, or it can be predetermined by the team, such as with a set schedule. Thus, distributed leadership enables team members to rotate leadership responsibilities, such as coordination and acting as liaisons to other teams (Erez et al., 2002).

Although new to the field of leadership, shared leadership and distributed leadership have been found to be associated with collectivism attitudes (e.g., focus on group welfare, success, and loyalty; Hiller et al., 2006). In addition, shared leadership and distributed leadership have been linked to a number of important team outcomes, such as increased organizational citizenship, member satisfaction, team effectiveness, and team performance (Carson, Tesluk, & Marrone, 2007; Erez et al., 2002; Hiller et al., 2006).

Limited research has focused on the relationship between shared and distributed leadership and collective cognition. Burke et al. (2003) proposed the influence of collective cognition on shared leadership, suggesting that the more team members have overlapping mental models, the stronger the team's understanding of when a team member should rise as the team leader. Teams function in a complex network where diverse members contribute unique information to the decision-making task and thus require collaboration and coordination among these members for successful performance. The impact leaders can have in shaping the knowledge sharing, task understanding, and coordination within a team is a critical key that researchers need to investigate. Thus, how shared and distributed leadership can detract or contribute to team performance is another avenue that must be considered. Does the impact of having multiple leaders over time actually strengthen a team's collective cognition, or do distinct perspectives actually break it down? We believe that as teams exchange leadership roles, they are more inclined to have a better understanding of other team members' task responsibilities. This, in turn, will translate to the development of better collective cognitive processes.

*Proposition 7: Shared and distributed leadership influence team membership and compositional forms of leadership.*

*Proposition 8: Shared leadership and distributed leadership influence team positively influence team performance and compositional forms of emergence.*

## APPLIED IMPLICATIONS

Stogdill (1950) defined leadership as "the qualities of an organized group that lead to the achievement of its purpose" (p. 4). Although the importance of leadership is widely recognized, and training programs tend to focus on one's quality or skills to improve performance (2000; DeChurch, Hiller, Morrison, & Morrison, 2006), training programs improve performance should be recognized in the team's actions and efforts to achieve its purpose. Actions to achieve it.

Based on recent meta-analytic research on the understanding of leaders' influence on team processes (DeChurch & Morrison, 2004), higher goals, leaders must help the team understand collective cognitive mechanisms. The coordination of individual actions and collective cognition is the key to team performance (DeChurch & Morrison, 2004; Morrison & Hamilton, 2010). Drawing on the work of Morgeson, DeRue, and Karim (2007), in the initial phase, leaders must help the team understand the mission, establish a vision, and plan for action. Training focused on developing collective cognition seems to be a promising leadership behaviors have been shown to be effective (see Table 5.2 and Figure 5.1).

ledges that leadership is composed be rotated among the members of & Elms, 2002). Distributed leader-merge based on the expertise he or to the team goal. Instead, distributed bers dispose of it. It can come about ned with his or her responsibilities, a, such as with a set schedule. Thus, embers to rotate leadership respon- ing as liaisons to other teams (Erez

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e relationship between shared and cognition. Burke et al. (2003) pro- nition on shared leadership, sug- have overlapping mental models, g of when a team member should ion in a complex network where formation to the decision-making d coordination among these mem- mpact leaders can have in shaping anding, and coordination within ers need to investigate. Thus, how detract or contribute to team per- be considered. Does the impact of ally strengthen a team's collective actually break it down? We believe s, they are more inclined to have a embers' task responsibilities. This, nent of better collective cognitive

*Proposition 7: Shared and distributed leadership within a team positively influence team members' development of task- and team-focused compositional forms of emergent cognition.*

*Proposition 8: Shared leadership and distributed leadership within a team positively influence team members' development of compilational forms of emergent cognition.*

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## APPLIED IMPLICATION

Stogdill (1950) defined leadership as "the process of influencing the activities of an organized group in its efforts toward goal setting and goal achievement" (p. 4). Although this classic definition explicitly recognizes the importance of leadership on collective actions, the leadership literature and training programs tend to focus on developing skills that enhance one's quality or skills to influence followers' affective components (Day, 2000; DeChurch, Hiller, Murase, Doty, & Rohre, 2009). Although these training programs improve leaders' behaviors, the essence of leadership should be recognized in the extent to which leaders orchestrate followers' actions and efforts to achieve a collective goal and orchestrate individual actions to achieve it.

Based on recent meta-analytic findings, we should expand our understanding of leaders' influence beyond simply motivational and behavioral team processes (DeChurch & Mesmer-Magnus, 2010a). To achieve higher goals, leaders must realize or be trained on how to influence collective cognitive mechanisms that enhance orchestration and coordination of individual actions. Years of team literature suggest that collective cognition is the key to smooth coordination among members (DeChurch & Mesmer-Magnus, 2010a; Mohammed, Ferzandi, & Hamilton, 2010). Drawing on the model of Marks et al. (2001), Morgeson, DeRue, and Karam (2010) summarize that in the transition phase, leaders must help members establish similar cognitive schemas by defining the mission, establishing expectations and goals, and planning for action. Training focused on leadership behaviors that influence collective cognition seems to be promising but underestablished. Many leadership behaviors have been proposed and linked to collective cognition (see Table 5.2 and Figure 5.1). Thus, for practitioners to fully take

**TABLE 5.2**  
Linking Forms of Leadership and Emergent Cognition

Forms	Leadership		Proposition
	Specific variables	Emergent Cognition	
Behavior	Planning	Compositional	1. Team leader planning behavior positively influences team members' development of task-, team-, and strategy-focused compositional forms of emergent cognition.
	Role clarification	Compilational	2. Team leader role clarification behavior positively influences team members' development of compilational forms of emergent cognition.
	Communicating information	Compositional	3. Team leader informational communication behavior positively influences team members' development of task-, team-, and strategy-focused compositional forms of emergent cognition.
Strategic	Sensemaking	Compositional and perceptual	4. Strategic leader sensegiving behavior positively influences team members' strategy-focused compositional and perceptual forms of emergent cognition.
	All core transformational	Compositional	5. TL behaviors positively influence team members' strategy-focused compositional forms of emergent cognition.
Functional	Briefing behavior and preparation	Compositional and compilational	6. Team leaders who engage in functional leadership behaviors involving (a) mission briefings, and (b) team preparation positively influence team members' development of task-, team-, and strategy-focused compositional forms of emergent cognition and compilational forms of emergent cognition.
	Role clarification	Compositional and compilational	7. Shared and distributed leadership within a team positively influence team members' development of task- and team-focused compositional forms of emergent cognition.
Shared			8. Shared and distributed leadership within a team positively influence team members' development of compilational forms of emergent cognition.

Emergent cognition



**FIGURE 5.1**  
Relationships between types of leadership and emergent cognition

advantage of this research, different behaviors to appropriately focusing on the effects of leadership. We add another piece to the puzzle of the impact of teams and, further,

## CONCLUSIONS

We have much to celebrate with the research that has accumulated over time. The importance of both leadership and team linkages between leadership and team research in the leadership literature has been highlighted between the two (e.g., Fissler et al., 1995; Zaccaro et al., 2001), research on leadership (DeChurch, Hiller, et al.) and team research (Mohammed et al., 2006).

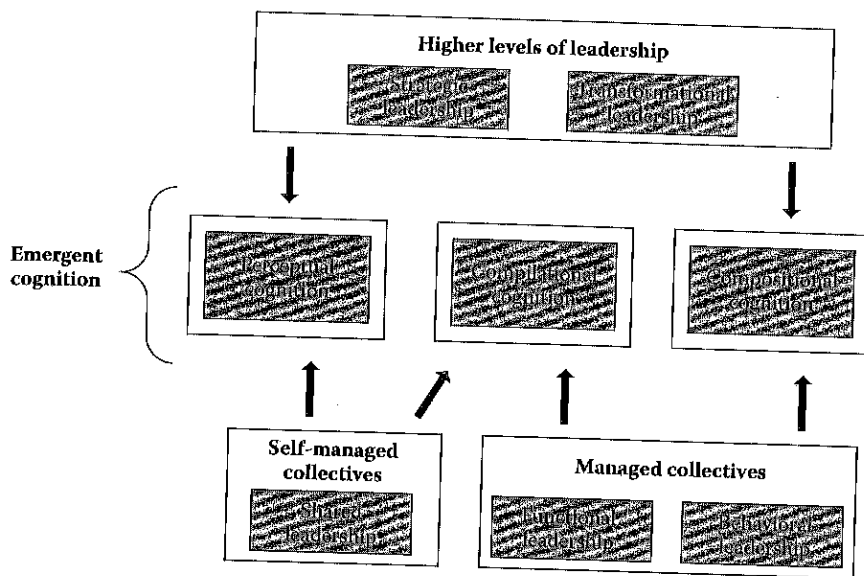


FIGURE 5.1 Relationships between types of leadership and collective cognition.

advantage of this research, we must identify specific linkages from different behaviors to appropriate types of team cognition. Future research focusing on the effects of leadership on collective cognition can help us add another piece to the puzzle that will allow us to strengthen the impact of teams and, furthermore, of organizations.

## CONCLUSIONS

We have much to celebrate when it comes to the body of scientific evidence that has accumulated over the past few decades regarding the nature and importance of both leadership and collective cognition. Although we have come a long way, greater attention needs to be devoted to understanding the linkages between leadership and collective cognition. Despite the fact that the leadership literature has proposed theoretical and empirical linkages between the two (e.g., Fiss & Zajac, 2006; Morgeson et al., 2010; Weick, 1995; Zaccaro et al., 2001), recent reviews summarizing 20 years of leadership (DeChurch, Hiller, et al., 2009) and 15 years of shared mental models research (Mohammed et al., 2010) indicate that relatively few studies

Transformational	All core transformational	perceptual	strategy-focused compositional and perceptual forms of emergent cognition.
Functional	Briefing behavior and preparation	Compositional	5. TL behaviors positively influence team members' strategy-focused compositional forms of emergent cognition.
Shared	Role clarification	Compositional and compilational	6. Team leaders who engage in functional leadership behaviors involving (a) mission briefings, and (b) team preparation positively influence team members' development of task-, team-, and strategy-focused compositional forms of emergent cognition and compilational forms of emergent cognition.
			7. Shared and distributed leadership within a team positively influence team members' development of task- and team-focused compositional forms of emergent cognition.
			8. Shared and distributed leadership within a team positively influence team members' development of compilational forms of emergent cognition.

have examined the relationships between various forms of leadership and various forms of collective cognition. In this chapter, we present a set of propositions to guide empirical research in this area. Implicit in this set of propositions is the need for multilevel methodologies to examine the leadership cognition relationships within and across organizational levels. Also implicit in this set of propositions is the need for time-lagged designs to examine temporal issues associated with the emergence of collective cognition, emergence of shared leadership, and the importance of various leadership functions, processes, and behaviors.

Kozlowski and Klein (2000) have argued that emergence cognition should be characterized as compositional and compilational in form. This distinction is particularly important for understanding how various types of cognition form and emerge at higher levels. In this chapter, we examine the linkages between leadership and the development and emergence of both compositional and compilational forms of cognition. We further argue that the empirical study of this alignment is critical to the continued evolution of the leadership and collective cognition literatures.

To perform effectively and become or remain viable, members must share strategic objectives and expectations but also maintain their own unique perceptual lens arising from their roles and functions. The challenge for leaders is to satisfy complex demands for developing and maintaining conversion as well as diversion on collective cognition. These demands come from various sources: (a) strategic objectives and plans; (b) internal resources, capabilities, and weaknesses; (c) individual and collective task responsibilities; (d) social norms and expectations; and (e) beliefs about the unit itself. These areas represent various forms of collective cognition, each of which plays some role in enhancing the interactions or ultimate effectiveness of the collective unit. Developing conversion on these sources may not always be beneficial for the team because it may lead to negative consequences such as groupthink (Janis, 1971). Research on relationships between specific leadership behaviors and types of collective cognition will significantly advance the understanding of collective process influencing its performance.

Leadership has long been considered a unique property of teams (Stogdill, 1950), and both leaders' influence and power have been recognized for a long time. However, leadership in the teams literature is often overlooked, as is the relationship between leadership and collective cognition. However, recent studies provide some indication that organizational

science researchers are paying attention to the relationship between leadership and collective cognition (e.g., Kozlowski et al., 2009). This is an encouraging development. Leadership and team cognition research is needed to identify functions and behaviors that are associated with specific forms of collective cognition, and Salas posited that team cognition is a key to solving work puzzle we needed to further understand team cognition and development. The next step is to integrate the knowledge of leadership and collective cognition to gain a better understanding of how different forms of leadership influence teamwork.

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ered a unique property of teams fluence and power have been recog- rship in the teams literature is often een leadership and collective cogni- some indication that organizational

science researchers are paying greater attention to the linkages between leadership and collective cognition (e.g., Giberson et al., 2009; Randall et al., 2009). This is an encouraging trend, and we encourage both leadership and team cognition researchers to examine the specific leadership functions and behaviors that play a role in the formation and emergence of specific forms of collective cognition. In the 1990s, Cannon-Bowers and Salas posited that team cognition was a critical piece of the teamwork puzzle we needed to further consider. Many studies have examined team cognition and demonstrated its utility. Therefore, our next step is to integrate the knowledge and capabilities from both the leadership and collective cognition fields in order to develop a better understanding of how different forms of team cognition can be developed and influence teamwork.

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## 6

Elaborating C  
Cognitive Sim

Joan R. Rentsch and

Through selection, social processes, individuals work or interpretations of events including those related to environment, and so on. Some functional for people in groups can smooth interactions, edge transfer (e.g., Dyer, Delise, & Hutchison, 2000) reinforced to the extent that they, themselves, control the controlled by them (e.g., B similar meanings have given researchers, who have studied levels of analysis, and when similarity, climate, culture

A fair amount of research on events and outcomes associated have advocated elaborating (e.g., Rentsch, Small, & H cal approaches to study Shmulyian, & Kinicki, 200 this discussion, particularly teams. In this chapter, variables associated with present the notion of cognitive methods for operationali