

A TEMPORALLY BASED FRAMEWORK AND TAXONOMY OF TEAM PROCESSES

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In this article we examine the meaning of team process. We first define team process in the context of a multiphase episodic framework related to goal accomplishment, arguing that teams are multitasking units that perform multiple processes simultaneously and sequentially to orchestrate goal-directed taskwork. We then advance a taxonomy of team process dimensions synthesized from previous research and theorizing, a taxonomy that reflects our time-based conceptual framework. We conclude with implications for future research and application.

Much of the work in organizations is completed through teamwork: people working together to achieve something beyond the capabilities of individuals working alone. Success is not only a function of team members' talents and the available resources but also the processes team members use to interact with each other to accomplish the work. Understanding the processes that employees use to work together in teams will enable organizations to retool human resource systems and managers to select, train, develop, and reward personnel for effective teamwork.

The realization that process plays a pivotal role in team performance has led to a proliferation of team studies in applied settings and research laboratories in the past twenty years. During this time, there has been increased attention on developing theoretical models of team effectiveness, with team processes occupying a central role (e.g., Gist, Locke, & Taylor, 1987; Guzzo & Shea, 1992; Hackman, 1983). In these models researchers generally have adopted an input-process-outcome (I-P-O) framework. They view processes as mediating mechanisms linking such variables as member, team, and organizational characteristics with

such criteria as performance quality and quantity, as well as members' reactions.

With the growing interest in team research, these conceptual models have rapidly gained popularity as the foundation for hundreds of empirical studies. Yet there remains a need for greater conceptual clarity in our understanding of teamwork, since there is still no unified conception of what team processes are and how they operate during team goal accomplishment. To further our ability to assess teamwork processes in studies of team effectiveness, we need a common conceptual and structural foundation for the concept of team process.

Our purpose in this article is to advance future studies of team effectiveness by taking a detailed look at the concept of team process along four major themes. First, we offer a definition of team process aimed at reducing some of the current confusion in the literature over this ubiquitous term, and we discuss the types of variables that fall under the process umbrella, as well as identify those that do not. Second, we advance a temporally based conceptual model of team processes that, we believe, has widespread applicability to many team types, and we articulate how team processes operate in recurring phases within an episodic framework of team performance. Third, we introduce a new taxonomy of team process dimensions, arguing that there are ten critical processes clustered

into three higher-level categories, distinguishable on the basis of time (relatively speaking) and content domain. This taxonomy is wed to the time-based model that we advance and grounded heavily in prior work in this area. Finally, we provide recommendations for using this taxonomy to further team process assessment in research and practice.

THE CONSTRUCT OF TEAM PROCESS

Our review of the literature featuring investigations or discussions of team process revealed surprisingly few definitions of the construct, and the ones provided typically were very general in nature. For example, in a recent review of team effectiveness research, Cohen and Bailey define team process as "interactions such as communication and conflict that occur among group members and external others" (1997: 244). McGrath refers to team interaction process as "patterned relations" among team members (1984a: 11). Although these types of definitions give readers a "feel" for what is meant by team process, they are not specific enough to provide clear guidance to researchers. We define team process as members' interdependent acts that convert inputs to outcomes through cognitive, verbal, and behavioral activities directed toward organizing taskwork to achieve collective goals. Centrally, team process involves members' interacting with other members and their task environment. Team processes are the means by which members work interdependently to utilize various resources, such as expertise, equipment, and money, to yield meaningful outcomes (e.g., product development, rate of work, team commitment, satisfaction).

We, as have others, distinguish team processes from taskwork, defined as "a team's interactions with tasks, tools, machines, and systems" (Bowers, Braun, & Morgan, 1997: 90). Taskwork represents what it is that teams are doing, whereas teamwork describes how they are doing it with each other. Taskwork is critical to team effectiveness and depends heavily on member competence as well as team processes. Team processes are used to direct, align, and monitor taskwork. Of course, this distinction may become blurry in practice, but our focus here is on the team processes that enable teams to orchestrate taskwork activities for goal accomplishment.

Certain organizational contexts may place a premium on particular forms of teamwork (Guzzo & Shea, 1992), but here we address somewhat more general processes that have widespread applicability. We delineate the multidimensional nature of team process later, in the section on taxonomy development. For now, our point is that teams use different types of processes to convert inputs into outcomes. A review of the process literature indicates that most authors believe the essence of the construct lies in team interaction and that different forms of team processes describe the types of interactions that take place among team members during the course of goal accomplishment. We should note, however, that the nature of the team activity performed might act as a boundary condition for the points we advance below. More specifically, Sundstrom (1999) suggests that work teams could be categorized into six types: (1) project, (2) production, (3) service, (4) action/performing, (5) management, and (6) parallel. As will become evident below, because of the temporal nature of activities performed, our framework pertains best to the first four types of teams listed above and less to management and parallel teams.

PROCESSES VERSUS EMERGENT STATES

Even with general agreement on the conceptual meaning of team process, widespread concerns exist regarding the selection and operationalization of process variables for use in research. One particular problem that has slowed the progression of the team process literature is the diversity of variables that have been selected as "processes" in tests of I-P-O relationships. For example, variables such as collective efficacy, potency, cohesion, and situational awareness have been used frequently to represent process. We submit that these types of constructs do not denote interaction processes but, instead, tap qualities of a team that represent member attitudes, values, cognitions, and motivations. We prefer to call these types of variables "emergent states": constructs that characterize properties of the team that are typically dynamic in nature and vary as a function of team context, inputs, processes, and outcomes.

Emergent states describe cognitive, motivational, and affective states of teams, as opposed to the nature of their member interaction. Al-

though researchers have not typically classified them as such, emergent states can be considered both team inputs and proximal outcomes. For example, teams with low cohesion (an emergent state) may be less willing to manage existing conflict (the process), which, in turn, may create additional conflict that lowers cohesion levels even further. This distinction is important, because indices of emergent states are often intermingled with interactional process indicators (e.g., coordination), which results in serious construct contamination. Emergent states do not represent team interaction or team actions that lead toward outcomes. Rather, they are products of team experiences (including team processes) and become new inputs to subsequent processes and outcomes. The point is that emergent states are not processes in and of themselves, because they do not describe the nature of member interaction.

In their review of applied team research, Cohen and Bailey (1997) make a related point by distinguishing processes from team psychosocial traits. Psychosocial traits are not explicitly defined in their article, but the authors provide examples of them: shared mental models, norms, affect, and cohesion. In a model they present (Cohen & Bailey, 1997), psychosocial traits are predicted by inputs and processes, and they drive both subsequent processes and outcomes. We choose to consider these variables emergent states rather than "traits" because of their mutable qualities. A trait is "a relatively enduring characteristic" (Kerlinger, 1986: 453) that has an air of permanency, whereas states are more fluid and more easily influenced by context. Some emergent states vary frequently, even in fairly short periods of time. For example, cockpit crews can phase in and out of situational awareness at different points during a single flight. Other states, such as cohesion, are malleable in newly formed teams but tend to remain fairly stable in those with a long history (Mullen & Copper, 1994).

Emergent states and other team traits and characteristics serve as inputs and influence the execution of teamwork processes and taskwork, which are likely to alter subsequent emergent states, as well as teamwork and taskwork further down the line. This cyclical pattern continues until teams reach more distal team outcomes. Teamwork processes and taskwork often seemingly co-occur, especially in highly inter-

dependent team contexts (e.g., fielding and throwing the baseball are critical taskwork components involved in turning a double play, but the coordination at second base is critical). Processes guide the execution of taskwork. Yet the way in which taskwork is executed (e.g., quality and efficiency of work) certainly impacts the need for processes to govern further team activity.

In sum, the term *teamwork processes* describes interdependent team activities that orchestrate taskwork in employees' pursuit of goals. Teamwork processes are the vehicles that transform team inputs to both proximal and longer-term outcomes. To avoid construct confusion and to sharpen the conception of team process, investigators must recognize the distinctions among teamwork processes, taskwork, emergent states, and more permanent team traits and characteristics.

A RECURRING PHASE MODEL OF TEAM PROCESSES

The purpose of the recurring phase model of team processes is to outline how temporal factors impact team functioning. Although previous authors have offered valuable taxonomies of team processes, none to date have tied them explicitly to a dynamic model of team effectiveness. Our framework is consistent with Zaheer, Albert, and Zaheer's (1999) recent call for more attention on time and how temporal intervals influence organizational processes. We argue that different team processes are critical at different phases of task execution and that I-P-O relationships occur over a series of related cycles. We advance this framework by (1) reviewing and synthesizing relevant background literature that describes how temporal influences affect teams, (2) introducing the logic of episodes as sequenced temporal units in which teams perform on their path to goal accomplishment, and (3) presenting a recurring phase model and the notions of transition and action phases to describe temporal influences on team processes.

Temporal Influences on Teams

No work-related tasks are performed in a vacuum, unaffected by deadlines, time limits, or schedules. Work teams strive toward collective

goals that incorporate time as a component (Locke & Latham, 1990). Time factors such as project deadlines, synchronization of schedules, alignment of coordination efforts, and so forth dictate many aspects of team functioning, including the strategies that are employed, the pace of activities, and role assignments that develop in order for the teams to perform successfully. Time-based rhythms act to shape how teams manage their behavior. However, there is a paucity of research on how teams integrate temporal processes into their functioning. In the vast majority of empirical studies, researchers have taken a rather static perspective when it comes to examining team effectiveness (McGrath, 1993). By this we mean that researchers have traditionally examined I-P-O relationships within a single task accomplishment period. Even when authors observe teams over more extensive periods, in their analyses they usually aggregate process data gathered over time into a summary index that portrays direct process→outcome relationships (e.g., Barry & Stewart, 1997). Thus, variance across time is collapsed into a static indicator of teamwork process as though it occurs at a single point in time. The result is that temporal factors are eliminated from further examination.

The framework advanced here is designed to explain how time relates to team goal attainment, rather than phases of a team life cycle or development (e.g., Tuckman, 1965). Some researchers have focused directly on the role of time as related to team goal-related activities (e.g., Gersick, 1988, 1989; Kelly & McGrath, 1985). However, there have been few efforts to synthesize this body of work and to expand it to explain goal attainment with a dynamic model of team functioning. Kozlowski, Gully, Nason, and Smith's (1999) team development model and McGrath's (1991) theory of time, interaction, and performance (TIP) are two important exceptions. Kozlowski et al. (1999) argue that team tasks cycle in intensity and that these cycles are used to develop learning skills at different stages of development. We build on their view that "team compilation" is "a sequence of modal phases and transition points" and that different team activities occur in different phases of team development (1999: 248–250).

McGrath (1991) argues that teams simultaneously manage multiple bundles of activities over time. A significant aspect of this manage-

ment is the "complex matching of bundles of activities to particular periods of time" (1991: 163; emphasis added). We share McGrath's view that teams are typically engaged in the pursuit of multiple goals simultaneously; thus, several tasks are often being juggled at any one time. The pursuit of multiple goals simultaneously "creates an environment where members are engaged in complex sequences of interdependent tasks that comprise a larger project" (McGrath, 1991: 149). McGrath talks about time as an environmental driver, and we further this with the notion that time is linked to goal accomplishment in an episodic framework. For simplicity's sake, we begin by explaining the role of temporal influences on the achievement of a single team goal, although later we elaborate to point out the complexities that teams face when managing task accomplishment in the pursuit of multiple goals.

Team Performance Episodes

Team performance trajectories most commonly consist of several I-P-O-type cycles that run sequentially and simultaneously. Our framework is based on the idea that teams perform in temporal cycles of goal-directed activity, called "episodes" (Weingart, 1997; Zaheer et al., 1999). Episodes are distinguishable periods of time over which performance accrues and feedback is available (Mathieu & Button, 1992). They constitute the rhythms of task performance for teams, and they are marked by identifiable periods of action and transition periods between actions. Episodes' durations stem largely from the nature of the tasks that teams perform and the technology that they employ, and from the manner in which members choose to complete work. Episodes are most easily identified by goals and goal accomplishment periods. The conclusion of one episode normally marks the initiation of another, whether these are work orders, quarterly sales profits, or halves of a sporting event (although there are variations on this pattern—most notably, more complex arrangements where episodes overlap). Episodes may vary substantially in their length and consistency, and they are often segmented into sections or subepisodes of more limited scope and duration that contribute to the larger effort. Further, each episode has a valence, or relative importance, attached to it that may heighten or

weaken its salience to the team, given the myriad of demands the team faces.

Up to this point we have discussed performance episodes as though teams pursue just one of them at a time. However, virtually all present-day work teams have to multitask in order to manage several performance episodes simultaneously (McGrath, 1991). Consequently, they often work in multiple performance episodes at a given point in time, each with its constituent subgoals and episodes and with its associated rhythms and sequence. Just as teams need to break down and sequence subepisode accomplishments, they must orchestrate multiple episode interfaces. Moreover, the timing and duration of these episodes may often differ markedly and cause even greater coordination demands. The primary challenge is for teams to develop and execute a multifaceted plan of work that simultaneously manages performance gaps in each of their important performance episodes.

The complexities described above are handled by a host of team processes. First, there is a premium on understanding the larger work environment within which the team is operating, developing appropriate strategies and contingency plans, and specifying clear goals during transition phases. The role of communication is heightened, especially during periods when members need to coordinate actions and to monitor the environment and the team's progress. Pressures and demands inevitably lead to confusion and conflict among members and can erode their motivation, confidence, and morale. Processes are the means by which teams manage all of these concerns during multiepisodic goal accomplishment. The types of processes that occur differ, in part, because of the particular activities that are being conducted at any given time during a performance episode.

We now turn to a discussion of a model that explains what types of processes are more likely to occur at different periods within performance episodes.

Recurring Phase Model of Team Processes

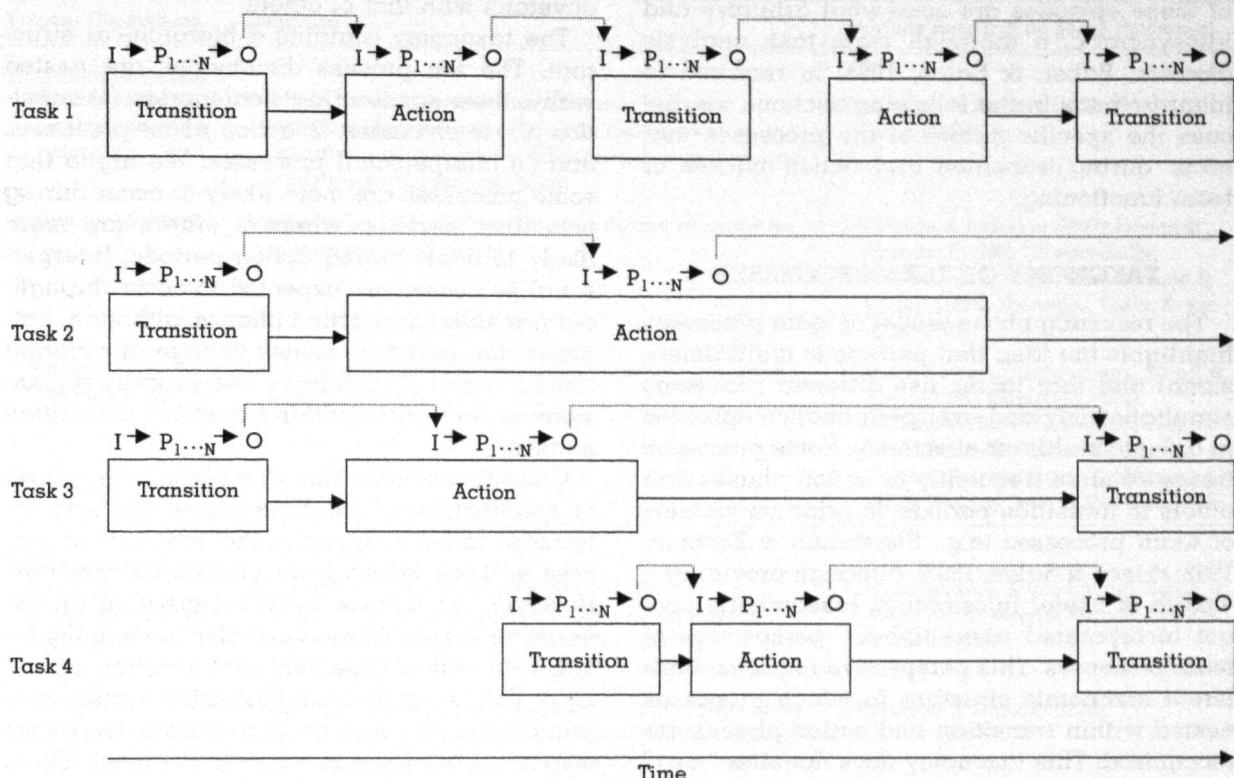
We introduce the notion of a recurring phase model of team processes to delineate the role of process in performance episodes. We submit that, over time, team performance is best viewed as a series of related I-P-O episodes. We assert

that I-P-O models are attached to episodes and subepisodes, rather than the entire life cycle of the team. Outcomes from initial episodes often become inputs for the next cycle. Processes are likely to vary in importance across episodes.

Adopting this episodic approach suggests that teams are actively engaged in different types of taskwork at different phases of task accomplishment. Sometimes they are focused on activities related directly to goal accomplishment, while at other times they are reflecting on past performance and planning for future action. We refer to these different emphases as "action" and "transition phases." Action phases are periods of time when teams are engaged in acts that contribute directly to goal accomplishment (i.e., taskwork). Such actions may vary considerably by team type. Surgical teams perform operations, marketing teams develop advertising campaigns, and product development teams coordinate design efforts. In contrast, transition phases are periods of time when teams focus primarily on evaluation and/or planning activities to guide their accomplishment of a team goal or objective. These refer to the times when teams take inventory of how well they performed during the previous episode and prepare for the upcoming episode. Teams compare current performance levels against goals and derive performance gaps. Closing these gaps, in combination with current and anticipated future assignments, guides the development of future performance goals and the strategies to achieve them.

Figure 1 illustrates the temporal rhythm of team task accomplishment by integrating the central elements of our conceptual framework of team process. It depicts four different types of performance episodes that a team might execute while multitasking; these episodes vary in terms of their onset and cycle times. Task 1 depicts a fairly fast cycle rhythm with cyclical transition and action phases. Task 2 illustrates a much greater period of sustained activity before goal accomplishment is evaluated. Task 3 falls in between these two, whereas Task 4 represents a cycle similar to the first but in which the onset is delayed relative to the others. As Task 1 indicates, longer-term episodes are often segmented into sections or subepisodes of more limited scope and duration that contribute to the larger effort. I-P-O cycles are nested in action and transition phases within episodes; thus,

FIGURE 1
The Rhythm of Team Task Accomplishment



outputs generated from processes that occur during a transition phase, for example, become inputs for the ensuing action phase. Figure 1 shows that processes occur over and over again during team episodes, influenced by inputs (including emergent states) and influencing proximal outcomes (also including emergent states) within action and transition phases and across tasks and time as teams move toward goal accomplishment.

The nature of team process changes as teams move back and forth between action and transition phases. Teamwork processes that revolve around planning and evaluation occur more frequently in transition phases. In contrast, coordination and monitoring processes are likely to dominate the action phases of goal accomplishment. Thus, the cyclical transition-action phases highlight the types of team processes needed at a given time. The frequency, length, and predictability of action and transition phase alterations are functions of a variety of variables, such as team objectives, environment, expertise, norms, and leadership. Even so, transition and action

phases are not always separate periods and frequently blend into one another. Recall at the outset that we noted that team type may operate as an important boundary condition. Whereas the temporal rhythms of project, production, service, and action teams are fairly easy to discern, those of managerial and parallel teams are less apparent. Further, product, production, service, and action teams require taskwork activities that follow from planning, strategy, goal setting, and other preparations. In contrast, the actual taskwork activities of managerial and many parallel teams involve analyzing situations, formulating strategies, setting goals, and so forth. Although we still believe that one can distinguish between periods when a team decides how it will make decisions and the actual decision-making activities, the lines of demarcation are less clear.

In sum, we submit that identifying salient performance episodes is critical to understanding not only what but when team processes become critical to goal accomplishment. The transition and action phases delineate when certain team

processes are likely to be most salient. We further submit that because the timing and rhythm of these episodes are somewhat arbitrary and idiosyncratic, a thorough team task analysis (Bowers, Baker, & Salas, 1994) is required to identify them. In the following sections we discuss the specific nature of the processes that occur during transition and action phases of team functioning.

TAXONOMY OF TEAM PROCESSES

The recurring phase model of team processes highlights the idea that process is multidimensional and that teams use different processes simultaneously and over performance episodes in order to multitask effectively. Some processes transpire more frequently in action phases and others in transition periods. In prior taxonomies of team processes (e.g., Fleishman & Zaccaro, 1992; Prince & Salas, 1993), although providing a wealth of useful information, researchers have not incorporated a multiphase perspective of team processes. This perspective requires a different taxonomic structure in which processes nested within transition and action phases are recognized. This taxonomy does not offer "new" process dimensions per se but, rather, a new temporally based categorization system for existing constructs that fit the definition of team process proposed in this article.

Development of the Taxonomy of Team Processes

Our intention is to devise a taxonomy that is broad enough to apply to different types of teams yet specific enough to be easily understood for applied and research purposes. We created our taxonomy by (1) reviewing the extant literature on team processes (both conceptual models and empirical studies), (2) developing a framework of team processes to provide conceptual clarity, (3) using previous classification efforts, and (4) integrating our applied experiences with teams to generate process dimensions that are both distinct conceptually and consistent with our theory of team processes. Table 1 displays our taxonomy with dimension definitions. We view this taxonomy as a comprehensive effort that builds on and integrates previous work by many authors. In addition, Table 1 cross-references our ten dimen-

sions with those of earlier taxonomic and empirical efforts. This illustrates how our work dovetails with that of others.

The taxonomy contains a hierarchical structure. The ten process dimensions are nested within three superordinate categories: (1) *transition phase processes*, (2) *action phase processes*, and (3) *interpersonal processes*. We argue that some processes are more likely to occur during transition periods, whereas others are more likely to occur during action periods. Interpersonal processes are expected to occur throughout transition and action phases, although, naturally, the pertinent issues change at different times. Figure 2 illustrates the process dimensions as they occur within transition and action phases.

Careful consideration was given to the level of specification of the dimensions. We have attempted to fully represent the construct of process without leaving out critical components. However, we wanted to avoid creating an exhaustive list of process variables too lengthy for value in either research communities or the field. The result is a categorization system containing ten dimensions appropriate for teams across all contexts (to varying degrees). There may be processes specific to one type of team that are not included in our taxonomy. Each of the ten process dimensions refers to a general type of activity that can be performed anywhere from very well to very poorly.

Previous Team Process Classifications

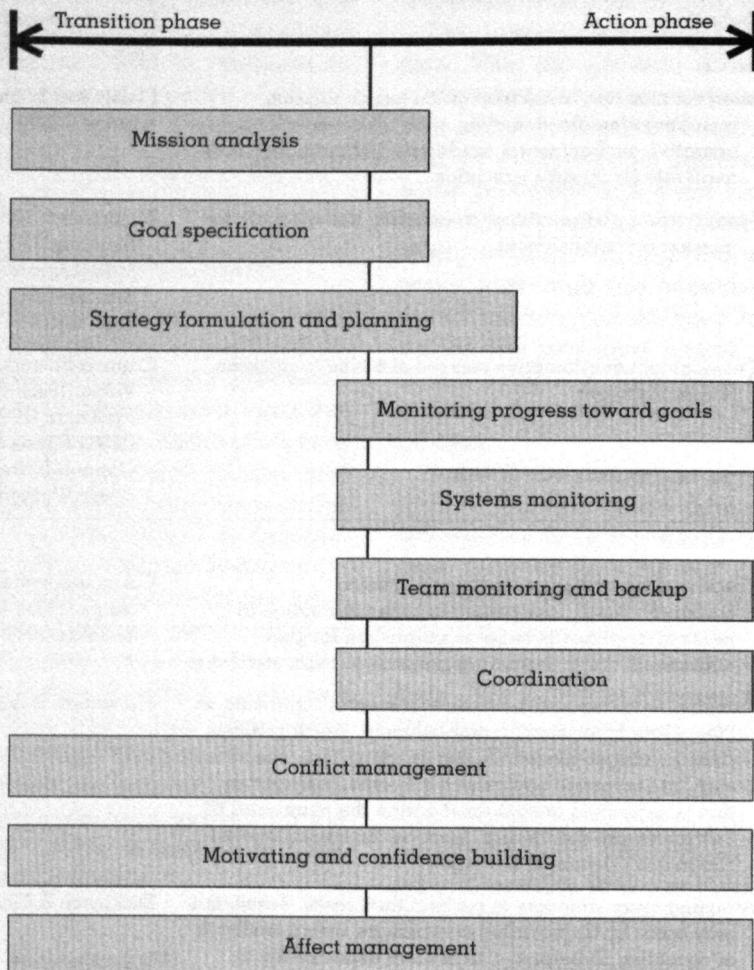
The idea of creating a classification system for team interaction is not new. There have been several formal efforts to construct comprehensive categorization schemes. Two particularly influential efforts include that of Prince and Salas (1993), who used literature reviews, critical incident interviews, and process ratings by naval aviators to identify a set of seven critical team skills, and that of Nieva, Fleishman, & Rieck (1978; later revised by Fleishman & Zaccaro, 1992), who developed a taxonomy of team performance functions. Although in neither effort do the authors attend to a temporally based framework, both works contain various process dimensions and were highly influential in the construction of the present taxonomy.

There are other team interaction classification systems in which member utterances are sorted

TABLE 1
Taxonomy of Team Processes

Process Dimensions	Definition	Previous Research on Team Processes
<u>Transition processes</u>		
Mission analysis formulation and planning	Interpretation and evaluation of the team's mission, including identification of its main tasks as well as the operative environmental conditions and team resources available for mission execution	Fleishman & Zaccaro (1992); Prince & Salas (1993)
Goal specification	Identification and prioritization of goals and subgoals for mission accomplishment	Dickinson & McIntyre (1997); Levine & Moreland (1990); O'Leary-Kelly, Martocchio, & Frink (1994); Prussia & Kinicki (1996); Sacvedra, Early, & van dyne (1993)
Strategy formulation	Development of alternative courses of action for mission accomplishment	Cannon-Bowers, Tannenbaum, Salas, & Volpe (1995); Gladstein (1984); Hackman (1983); Hackman & Oldham (1980); Prince & Salas (1993); Stout, Cannon-Bowers, Salas, & Milanovich (1999); Weldon, Jehn, & Pradhan (1991)
<u>Action processes</u>		
Monitoring progress toward goals	Tracking task and progress toward mission accomplishment, interpreting system information in terms of what needs to be accomplished for goal attainment, and transmitting progress to team members	Cannon-Bowers, Tannenbaum, Salas, & Volpe (1995); Jentsch, Barnett, Bowers, & Salas (1999)
Systems monitoring	Tracking team resources and environmental conditions as they relate to mission accomplishment, which involves (1) internal systems monitoring (tracking team resources such as personnel, equipment, and other information that is generated or contained within the team), and (2) environmental monitoring (tracking the environmental conditions relevant to the team)	Fleishman & Zaccaro (1992)
Team monitoring and backup behavior	Assisting team members to perform their tasks. Assistance may occur by (1) providing a teammate verbal feedback or coaching, (2) helping a teammate behaviorally in carrying out actions, or (3) assuming and completing a task for a teammate	Dickinson & McIntyre (1997)
Coordination	Orchestrating the sequence and timing of interdependent actions	Brannick, Prince, Prince, & Salas (1992); Brannick, Roach, & Salas (1993); Fleishman & Zaccaro (1992); Zalesny, Salas, & Prince (1995)
<u>Interpersonal processes</u>		
Conflict management	Preemptive conflict management involves establishing conditions to prevent, control, or guide team conflict before it occurs. Reactive conflict management involves working through task and interpersonal disagreements among team members	Cannon-Bowers, Tannenbaum, Salas, & Volpe (1995); Gladstein (1984); Jehn (1995); Pace (1990); Simons, Pellad, & Smith (1999); Simons & Peterson (2000); Smolek, Hoffman, & Moran (1999); Tjosvold (1985); Van de Vliert, Euwema, & Huismans (1995)
Motivation and confidence building	Generating and preserving a sense of collective confidence, motivation, and task-based cohesion with regard to mission accomplishment	Fleishman & Zaccaro (1992)
Affect management	Regulating member emotions during mission accomplishment, including (but not limited to) social cohesion, frustration, and excitement	Cannon-Bowers, Tannenbaum, Salas, & Volpe (1995)

FIGURE 2
Manifestation of Processes in Transition and Action Phases



into various categories: the interaction process analysis (IPA; Bales, 1950), the system of multiple-level observation of groups (SYMLOG; Bales, 1980), and time-by-event-by-member pattern observation (TEMPO; Futuran, Kelly, & McGrath, 1989). Coding systems such as IPA, SYMLOG, and TEMPO classify statements that team members make while communicating, but they fall short in identifying the processes that teams engage in during task performance. Because category membership is determined by the meaning of single member statements, there is no synthesis of the verbal interaction among team members to understand the processes that occur. Detecting processes often requires a more macro observation of the verbal exchanges and behaviors that take place during a particular

episode. For instance, the process of planning often requires team decision making and detailed preparation of team member actions for goal accomplishment.

Transition Phase Processes

As mentioned earlier, transition phases are periods of time when teams focus primarily on evaluation and/or planning activities to guide their accomplishment of a team goal or objective. The processes of mission analysis, goal specification, and strategy formulation and planning typically occur during time set aside for analysis, evaluation, and future direction (e.g., staff meetings, retreats, after-action reviews).

Mission analysis. Mission analysis is the interpretation and evaluation of the team's mission, including identification of its main tasks as well as the operative environmental conditions and team resources available for mission execution. The process of interpreting a mission within the given performance context occurs cognitively, as team members interpret their charge within the boundaries of team abilities, resources, and time constraints. This process also includes verbal discussion, to ensure that all members have a shared vision of the team's purpose and objectives. Mission analysis blends two foci: backward evaluation and forward visioning. The backward visioning aspect includes diagnosing previous performance and interpreting the causes of success and failure. Previous research has revealed that to the extent that teams better understand the underlying causes of previous performance, they can better prepare for future efforts (Blickensderfer, Cannon-Bowers, & Salas, 1997). The forward visioning aspect of mission analysis concerns how the team interprets its charge for the future in the context of ongoing events. Teams that fail to conduct thorough mission analyses will be undermined by changing circumstances or relegated to operating in a purely reactive mode. Worse yet, teams that abbreviate or omit mission analysis activities run the risk of misguiding their attention and efforts until it is too late to recover (Gersick, 1988).

Goal specification. Goal specification refers to the identification and prioritization of goals and subgoals for mission accomplishment. This is the process that teams go through to develop and assign overall mission goals and subgoals that indicate what and how much must be accomplished by a specified time and within certain quality standards. For instance, a snow removal team might set a goal of plowing 100 percent of the highways and 50 percent of the neighborhood streets in the county by the end of the day. This process usually occurs during transition phases and in conjunction with mission analysis and strategy development. Ideally, goals are aligned with strategies, and timelines are associated with mission accomplishment. However, goals might also have to be specified (or respecified) during action phases because of a team's inability to fully anticipate all situational contingencies. For example, a snow removal team may have to respecify its goals for

the day if weather conditions change or equipment becomes unavailable (Tesluk & Mathieu, 1999).

Whereas effective goal specification leads to challenging, attainable goals that are aligned with the larger organizational vision and with collective strategies, ineffective goal specification has debilitating effects on collective performance. Poorly conceptualized goals may be overly general, vague, conflicting, ambiguous, unattainable, impractical, or not valued by team members. These types of goals do not stimulate effective strategies, timelines, and collective activities for effective performance. A team that disregards the goal specification stage entirely ends up with no shared understanding of the team's purpose.

Strategy formulation and planning. Strategy formulation and planning refer to the development of alternative courses of action for mission accomplishment. This involves decision making about how team members will go about achieving their missions, discussion of expectations, relay of task-related information, prioritization, role assignment, and the communication of plans to all team members (Hackman & Oldham, 1980; Stout, Cannon-Bowers, Salas, & Milano-vich, 1999). Good strategy development includes consideration of situational and time constraints, team resources, member expertise, and the changing nature of the environment. The resulting strategies contain information about member roles and responsibilities, the order and timing of actions, and how task-related activities should be executed. Poor strategy development occurs when teams are unable to develop plans for successful goal accomplishment. This results in ineffective strategies (if there are strategies in place at all) that force teams to rely completely on past experience or improvise as they perform, which can be exceedingly difficult for complex and novel tasks.

We have further classified the strategy and planning dimension into three subdimensions: (1) deliberate planning, (2) contingency planning, and (3) reactive strategy adjustment. Deliberate planning refers to the formulation and transmission of a principal course of action for mission accomplishment. This is a chief activity of transition periods occurring at the beginning of episodes. For example, hotel catering teams meet each afternoon to develop a strategy that details the order in which next-day events will

be handled, as well as the member assignments for each catering job. These decisions are based on the information that is currently available, including event size, time and complexity, member capabilities, event importance, and location. It is a premeditated process (Weldon, 1998) and is consistent with the conceptualization of planning and strategy development most commonly found in the team literature.

Contingency planning refers to the *a priori* formulation and transmission of alternative plans and strategy adjustments in response to anticipated changes in the performance environment. We differentiate contingency planning from deliberate planning to highlight the need to prepare ahead of time for anticipated changing events. This includes specifying alternative courses of action and rules that teams will use at the appropriate time if/when needed. For instance, catering teams may devise a contingency plan for action that would take effect if an event should fall behind schedule, or if there is risk of last-minute cancellation for a particular event. Good contingency planning rests on "if/then logic" tied specifically to various "trigger events." The need to have a contingency plan increases for teams that perform in dynamic and unpredictable situations. They are the formation of "Plan Bs" that range from small tactical shifts to the development of entire alternative strategies for goal accomplishment. Importantly, contingency planning is primarily a transition period activity in which alternative courses of action are laid out *a priori* and pursued on the basis of intermediate outcomes (i.e., the trigger events).

When unexpected events occur during the action phases, or when errors are detected in a team's initial strategy, an unforeseen need emerges for strategic change. Reactive strategy adjustment is the alteration of existing strategy or plans in response to unanticipated changes in the performance environment and/or performance feedback. In effect, it signals the initiation of a transitory subepisode evoked to redirect a team's activity. When a team encounters a change in the performance environment for which neither the original strategy nor the contingency plan appears appropriate, it has to invent a new plan. An effective team decides "on the fly" to reconsider, abandon, or adjust the original plan.

Either because of unpredictable situations or faulty original plans, teams should have the ability to change strategies during action periods. This process results in new rules for collective goal attainment in the current performance context. For example, a new and swiftly transferable computer virus can cause an organization's computer support team to re-strategize immediately. Viruses are unpredictable and demand immediate attention, requiring the computer service team to change foci immediately, based on a newly emerging set of contextual parameters. Unlike primary strategizing or contingency planning, reactive strategy adjustment occurs during action phases, when teams must adapt to unexpected and abrupt environmental changes (Meyer, 1982; Weldon, 1998) or to emerging feedback that a current strategy is ineffective.

Action Phase Processes

Action phases are periods of time when teams conduct activities leading directly to goal accomplishment. In the sections below we discuss four process dimensions that occur most commonly during action phases: monitoring progress toward goals, systems monitoring, team monitoring and backup responses, and coordination activities.

Monitoring progress toward goals. Monitoring progress toward goals is defined as tracking task and progress toward mission accomplishment, interpreting system information in terms of what needs to be accomplished for goal attainment, and transmitting progress to team members. This involves providing feedback to the team on its goal accomplishment status so that members can determine their progress and their likelihood of success within a given period of time. Teams assess in real time the discrepancies between their goals and their current situation (Austin & Vancouver, 1996). This functions as a means of self-regulation by alerting teams when performance gaps emerge or when they veer off in a different direction. For example, product development teams will monitor how well they are progressing on a given task to determine whether to work overtime, call in additional help, or adjust their strategies or goals.

Monitoring goals includes not only detecting progress but transmitting that progress to team members. Statements about goal progress con-

tain information about how well the team has implemented its task strategy, as well as suggestions for how the team should alter its goals, plans, activities, or effort level in order to increase effectiveness or avoid problems (Gaddy & Wachtel, 1992; Weldon et al., 1991). Poor goal monitoring occurs when teams drift, procrastinate, or stray off task and lose track of their purpose for extensive periods of time. In addition, teams that are unaware of their progress cannot provide themselves with appropriate performance feedback (e.g., speed up, slow down, get back on track, locate more resources). Monitoring goals occurs with varying frequency, depending on the nature of the team. Teams that work in fast-paced environments (e.g., military command and control, firefighters) monitor their progress frequently during action phases. For other teams, progress monitoring occurs more periodically, sometimes taking place during transition periods that are used specifically for intermittent progress reports.

Systems monitoring. Systems monitoring refers to tracking team resources and environmental conditions as they relate to mission accomplishment; it involves (1) internal systems monitoring, tracking team resources such as personnel, equipment, and other information that is generated or contained within the team, and (2) environmental monitoring, tracking the environmental conditions relevant to the team. Effective teams manage their environments, both internal and external to the teams themselves, by observing changes that occur as they perform. They do this by monitoring critical information internal (e.g., equipment, resources) and external (e.g., constituents, weather patterns, economy, news events) to the team. This process is similar to what some have referred to as "situational assessment," in the sense that the process of monitoring critical internal and external systems, along with the effective communication of this information among team members, leads to situational awareness (Jentsch et al., 1999).

Effective teams that work in dynamic environments continually monitor systems. Moreover, they rely heavily on technology (e.g., machines, displays, counters) to facilitate this process. For example, an operating room team keeps constant watch of the heart-monitoring machine during open heart surgery. Any changes on the monitor are detected and then communicated to

other team members so that decisions about appropriate responses can take place. Likewise, pilot crews rely on extensive panels of instrumentation that must be checked regularly to detect flight problems.

Teams that work in less dynamic environments may set aside specific time periods for monitoring internal and external environments (e.g., surveys to assess buyer markets, weekly meetings to review resource allocations for projects). Poor systems monitoring is evidenced in some teams by erroneous interpretation of critical internal and environmental elements. For example, failure to attend to a weather storm warning might leave construction teams exposed to dangerous elements.

Team monitoring and backup responses. Team monitoring and backup is defined as assisting team members to perform their tasks, which may occur by (1) providing a teammate verbal feedback or coaching, (2) assisting a teammate behaviorally in carrying out actions, or (3) assuming and completing a task for a teammate. This dimension includes the provision of feedback and task-related support and the seeking of help from teammates when necessary. For team monitoring and backup to occur effectively, teammates need to be informed of others' role assignments in order to identify what type of assistance is required at a particular time. Often, team members watch out for one another, render assistance when required, and warn of possible problems or dangerous circumstances. For instance, in an airplane cockpit, copilots must stay abreast of the pilot's actions in order to detect or compensate for critical lapses in judgment or oversight. A failure to monitor teammates and to provide backup renders the entire team susceptible to a single shortcoming. If teammates are not looking out for, or willing to help out, each other, the team will fail when any one member fails.

Team monitoring is primarily a cognitive operation in which team members observe the actions of their teammates and watch for errors or performance discrepancies. When a team member identifies the need to provide help, backup behavior in the form of suggestive or corrective feedback (verbal and/or behavioral) is provided to assist the team member and get performance back on track (Dickinson & McIntyre, 1997).

Coordination activities. We define coordination activities as the process of orchestrating the

sequence and timing of interdependent actions. This refers to the management of synchronous and/or simultaneous activities, and involves information exchange and mutual adjustment of action (Brannick et al., 1993) in order to align the pace and sequencing of team member contributions with goal accomplishment. This feature of teamwork is closely intertwined with the task-work required of the team. Coordination often occurs during action phases (e.g., telecommunications service teams working interdependently during a new community installation) but also during transition phases (e.g., integrating work schedule demands with inventories, technician availability, and customer service mandates). The more interdependent the tasks, the more teams rely on coordination as a central process for effective functioning (Tesluk, Mathieu, Zaccaro, & Marks, 1997). Teams experiencing "communication breakdowns" and those that get "out of sync" are likely to be experiencing problems with their coordination process. This is what Steiner (1972) refers to as "process loss" due to coordination, when teams fall below their estimated productivity level.

Interpersonal Processes

The final three dimensions—conflict management, motivating/confidence building, and affect management—represent processes teams use to manage interpersonal relationships. We note that interpersonal processes occur throughout both transition and action phases, and typically lay the foundation for the effectiveness of other processes. We describe processes that govern interpersonal activities, rather than the emergent states that often emanate from such experiences.

Conflict management. Working in teams provides an interpersonal context in which conflicts may occur and attempts to manage them are made (Jehn, 1995). We have defined two types of conflict management processes that can be used to resolve or minimize conflict: (1) preemptive conflict management involves establishing conditions to prevent, control, or guide team conflict before it occurs, and (2) reactive conflict management involves working through task, process, and interpersonal disagreements among team members. We believe the degree to which conflict emerges, and eventually interferes with (or enhances) the productivity of work

teams, is a function of the conflict management process, which involves how the team handles conflict situations that have arisen or have the potential to arise. Research on conflict resolution targets what we refer to as "reactive conflict management." This involves techniques for reducing or facilitating conflict that has emerged during the team's performance cycle. Some techniques for reactive conflict management include identification of the parameters of conflict between team members (Pace, 1990), problem solving, compromising, openness and flexibility, and willingness to accept differences of opinions.

Preemptive conflict management focuses specifically on reducing or controlling the nature of team conflict before it occurs. The establishment of norms for cooperative rather than competitive approaches to conflict resolution (Tjosvold, 1985), team contracts or charters that specify *a priori* how team members agree to handle difficult situations (Smolek et al., 1999), and the development of team rules and norms about the nature and timing of conflict may be vehicles for curtailing the destructive aspects of conflict before they occur.

Motivating/confidence building. Motivating and confidence building involve generating and preserving a sense of collective confidence, motivation, and task-based cohesion with regard to mission accomplishment. This includes encouraging team members to perform better or to maintain high levels of performance. Teams motivate members by communicating their beliefs about team ability (e.g., pep talks), competence on particular tasks, and feedback on team success. They may also rely on imagery or modeling techniques to illustrate the capabilities that teams like themselves have for particular situations.

Interestingly, we have often observed teams act in ways that are demotivational to team members. Negative comments about the team's (lack of) competence or that of individual members can reduce confidence levels and task cohesiveness. Just as teams can enhance working relationships and performance by boosting their confidence level, so, too, they can hamper them by deflating themselves. Debilitating team processes can spiral teams into a vicious cycle that drags down both team confidence and performance over time (Lindsay, Brass, & Thomas, 1994). In addition, processes such as social loaf-

ing (Latane, Williams, & Harkins, 1979) and shirking (Jones, 1984) typically occur when low motivation levels reduce the amount of effort expended by members on the team task, thus lowering collective performance.

Affect management. Affect management involves regulating member emotions during mission accomplishment, including (but not limited to) social cohesion, frustration, and excitement. It refers to the process of calibrating team member emotional levels (George, 1990), which can be inflated (or deflated) because of task conditions (e.g., failure, temporal stress), personal factors (e.g., animosity among members), or situational factors (e.g., job security concerns). Techniques involved in regulating emotions may involve attempts to calm members down, control frustration levels, boost team morale and cohesiveness among members, and provide empathy. A telecommunications service and repair team deals frequently with stress-producing situations, such as dealing with irate customers and making weather-induced emergency repairs. The team can effectively handle the situation by actively working to calm down frustrated members or by sending in another person to deal with the angry customer. In contrast, the team could ineffectively manage member affect by ignoring, isolating, or fueling angry teammates.

Traditional team-building interventions have targeted affect management by focusing on the regulation of team member emotions. For example, traditional T groups put members into confrontational environments to deal with inter or intrapersonal issues (Patten, 1981). Exercises have been developed to manage the affect generated from team conflict (Harrison, 1983) and to improve relations among team members (Bechhard, 1983). Team activities such as joking, relaxing, and complaining may also be considered forms of affect management, if implemented in a manner that builds cohesion, breaks tension, vents frustration, or manages stressful situations. However, it is also possible that such activities, if managed ineffectively, may lead to increased negative affect, wasted time, and performance problems.

Summary of Taxonomy

This taxonomy offers a two-tiered classification system that arranges ten processes into

three higher-level categories. It is also aligned with the recurring phase model introduced earlier in the article, in that two of the three superordinate categories (i.e., transition and action processes) correspond directly with the phases of performance episodes. As we have stated, the lower-order dimensions within each of these categories may occur at any time, although they are more frequent in their respective phases. Interpersonal processes occur throughout episodes with regularity and are the kinds of factors that can rally or derail teams at any point.

For example, the ability to garner resources, to pull together, and to squelch petty conflicts may well enable a team to rise to an occasion and to reach performance levels well beyond what a composite of their knowledge, skills, and abilities would predict they could achieve. Alternatively, breakdowns in interpersonal relations can subvert even the best-organized strategy development session, or can lead to a failure to monitor and back up teammates or to other types of coordination breakdowns. Whereas the transition and action phase processes have a natural temporal rhythm and relationship to one another, the interpersonal processes can work as an attribute or liability throughout goal accomplishment episodes.

FUTURE IMPLICATIONS

Teams traditionally have been thought of as pursuing one task at a time to reach a single, collective goal. However, the primary arguments of the framework and taxonomy we advance here are that most teams work on multiple goals simultaneously and engage in multitask processing. The idea that teams perform in recurring transition and action phases, and that they use different processes during different points in time, challenges the way we have been thinking about team effectiveness.

Consistent with Zaheer et al.'s (1999) call for more attention on time in the study of organizational issues, we believe that researchers and practitioners should consider a team's temporal rhythms in measurements and evaluations of teamwork processes and effectiveness. A team task analysis is a necessary first step (Bowers et al., 1994) in exposing the temporal rhythms of team performance episodes, as well as the multitasking activities that teams pursue. In line with McGrath's (1991) point about how teams

simultaneously manage multiple bundles of activities over time, researchers should think about how teams allocate resources to multiple tasks over performance episodes.

In the following sections we discuss more specifically the implications of the team process framework and taxonomy for future process measurement, new research, and practice.

Process Taxonomy As a Guide for Process Measurement

We hope researchers will use the framework and taxonomy to further refine future research on team processes. Specifically, this work is intended to shape future conceptualization of both the scope and boundaries of team process, as well as to serve as a guide for measuring process constructs in forthcoming studies of team effectiveness. Our hope is that this work will provide researchers not only with guidance in the selection of appropriate process variables but with thoughts about how and when to measure them so that we can learn not only what but when team processes influence team effectiveness. The framework and taxonomy can help researchers with three critical issues that arise when planning studies to capture teamwork processes.

(1) **What teamwork processes should be assessed?** When the goal is to predict team effectiveness defined as performance quality and efficiency, transition and action processes should be targeted, because they have the greatest potential to impact the rate and caliber of task-work. Researchers interested in predicting team outcomes such as product development time and quality, decision accuracy, response time, customer service quality, amount of sales, or manufacturing errors might consider assessing such transition processes as goal specification and strategy formulation, as well as action processes like monitoring progress toward goals. Those studying team tasks that require high member interdependency could measure processes such as coordination and team monitoring and backup behavior (Tesluk et al., 1997), because they describe techniques that team members use to synchronize each other's activities. Those interested in teams that operate within complex, dynamic, and unpredictable environments might choose to focus more on such dimensions as mission analysis, strategy devel-

opment, and environmental monitoring, because these processes help teams to better understand both challenging and unstable performance situations.

However, researchers who are primarily interested in predicting team effectiveness defined as team longevity or satisfaction (Hackman & Morris, 1975) should consider assessing interpersonal processes. Interpersonal processes are more likely to influence team cohesion over time, which is a primary antecedent of team longevity and satisfaction. Thus, investigators who want to explain team turnover rates, team commitment, affect, efficacy, and satisfaction might target such processes as conflict and affect management and confidence building.

The ten-dimension taxonomy also implies that gaining a more complete understanding of how processes contribute to team effectiveness necessitates the measurement of more than one process variable. However, we recognize that measuring ten process dimensions is not often practical or necessary. When the research goal is to examine a broad range of processes, we suggest representing each superordinate category (transition, action, and interpersonal) with a process dimension most relevant to the research context. When the research goal is a targeted focus on a certain type of teamwork, measuring one or more dimensions within a superordinate category is recommended. Researchers should evaluate the particular tradeoffs between depth and breadth of process measurement versus the added complexity in research time and measurement. The taxonomy can serve as a good starting point for consideration of what processes are most critical, salient, or challenging in a particular environment.

(2) **What measurement strategy should be employed?** There is a variety of strategies available for process assessment (see Weingart, 1997, for an excellent review). Studies in which researchers have examined multiple processes typically have involved use of a single measurement strategy (e.g., Campion, Medsker, & Higgs, 1993; Hyatt & Ruddy, 1997), either survey methodology or behavioral observation. However, certain measurement strategies are more appropriate for some processes than others. For example, processes such as strategy formulation, goal specification, coordination, and backup are generally observable, lending themselves to the

use of observer ratings. Mission analysis and environmental monitoring may be less observable, so techniques such as in-baskets, interviews, and self-report questionnaires may provide alternate methods to examine these processes. We encourage researchers interested in assessing multiple processes within the context of a single study to consider (when feasible) employing multiple measurement techniques that best align with the dimensions of interest (see Tesluk et al., 1997).

In addition, researchers should consider less traditional and more creative methods of capturing teamwork processes that would be sensitive to time-based dynamics. Williams and Alliger (1994) employed a design in the study of affective state-behavior relationships in which they used daily diaries and behavioral checklists. In this way, employees could be asked to write teamwork process information in journals either daily or when critical teamwork events occurred. Team researchers could supplement traditional survey and observational data collection designs with handheld computers, videotapes, archival measures (e.g., e-mail and videoconferencing records, performance traces, and so forth), and other methods to collect real-time data. The point is that not all process dimensions should necessarily be targeted, and different ones may be better assessed using different measurement techniques (see Tesluk et al., 1997, for a detailed outline of team process measurement strategies).

(3) When should team processes be assessed? The recurring phase model introduced earlier depicts team performance as composed of a series of episodes, each containing cyclical I-P-O linkages. Currently, we rely on single or aggregate measurement of teamwork to show relationships between overall teamwork quality (or quantity) and performance. Longitudinal and time sampling approaches that align team process measurement with performance episodes (Zaheer et al., 1999) will permit an examination of how teams work together as they move through different phases of goal accomplishment. For example, teamwork such as affective management is absolutely critical for nuclear power plant control teams during planned and unexpected shutdowns (Gaddy & Wachtel, 1992). Observation of a nuclear operating crew's teamwork processes during normal operations would probably show very little teamwork activity (oth-

er than systems monitoring). Making the same observations during start-up or shut-down operations, however, would be most illuminating.

This type of approach will enable researchers to answer questions about when teamwork is most critical for team effectiveness, which then has significant implications for when team training or other interventions should be introduced.

In the laboratory environment, team tasks can be designed to unfold over time and to elicit different processes by embedding trigger events in the task environment (e.g., the TARGETS methodology; see Dwyer, Fowlkes, Oser, Salas, & Lane, 1997). For example, if a researcher uses a three-month-long team business simulation to study the relationship among strategy development, environmental monitoring, and corporate financial performance, he or she should consider when strategies and monitoring are most likely to occur and target measurement at that point. An experimental platform could be designed to place a premium on strategy development within the first week of performance, followed by pivotal environmental instability (requiring monitoring) in weeks four and seven. Strategy development should be measured during or following week one, and monitoring during weeks four and seven.

In sum, our recommendations go beyond the typical lament for longitudinal research and use of multiple sources of measurement. Yes, longitudinal designs are important, but it is not sufficient to simply collect all measures of interest periodically, say quarterly, via a survey. We argue that particular types of measures should be gathered at appropriate times and using measures that are most suitable for the nature of the construct(s) being examined—all based on the knowledge garnered from a time-sensitive team task analysis. In practice, such a strategy is likely to offer the greatest payoff in terms of insight gained from the efforts invested in data collection.

Process Framework and Taxonomy As a Basis for Practical Applications

The heavy reliance on teams in applied settings has created an increased need for tools and interventions targeted specifically at optimizing team effectiveness (Stevens & Campion, 1994). The conceptual framework and taxonomy

introduced here have implications for the structuring of teams, as well as the design and application of human resource management systems. Primarily, they bring to the forefront the importance of considering how time impacts teamwork and that various teamwork processes are more and less likely to occur at different points in the performance cycle. Thus, a logical first step is to understand a team's temporal rhythms and episodes and then to consider what, when, and how teamwork processes contribute to critical performance outcomes.

To do so, we suggest conducting a traditional team-level task analysis (Bowers et al., 1994) embedded within a temporal framework in order to decipher team performance rhythms critical to goal accomplishment within a particular team context, noting what behaviors and activities occur together during a single performance episode—in other words, tracking how teams work together over time to obtain collective goals. For example, a time-sensitive team task analysis carried out for a certain company's retail sales teams might detail planning meetings that occur primarily at the beginning of each month, followed by periods of active customer site visits and weekly progress and coordination meetings. The focus of the planning meetings is to develop goals, to analyze particular facets of the environment that help them (e.g., strong economy) or hinder them (e.g., competition), and then to develop appropriate strategies to meet those goals. Customer site visits require coordination, monitoring each other's customer loads, and affect management when sales are not going well. This information, used alongside the taxonomy, gives rise to a number of practical applications regarding team feedback, performance appraisal, staffing, and training.

Team appraisals and feedback. The taxonomy could also be used to conduct team process appraisals, where particular teams would be evaluated on their ability to conduct each of the processes identified as critical by a team task analysis. The resulting team process profile would delineate teamwork strengths and weaknesses. This information could then be used to provide teams with customized feedback and interventions, as well as to identify specific developmental and training needs. For example, rather than rely on generic team-building interventions as a universal solution for all process-related problems, teams in constant discord can

be provided with conflict management skills. Other teams that depend heavily on backup behavior can receive focused training in team monitoring and coaching behavior.

A time-sensitive team task analysis, used in conjunction with the framework presented here, should also provide concrete prescriptions of when feedback should be available to teams at different points in time. For example, feedback entailing a qualitative shift in team strategy (Gersick, 1989) should be presented during transition phases, when teamwork is focused mainly on guiding team efforts through strategy formulation, mission analysis, and goal specification. In transition periods, teams are more prepared to consider changing environmental influences, revisit plans, and realign goals associated with adopting new strategies. However, feedback containing new strategies introduced in the middle of action phases runs the risk of derailing ongoing goal accomplishment processes. Action-phase feedback should pertain largely to monitoring team progress, systems, members, and coordination. In general, team-level feedback should be delivered based on the type of information necessary at different points in the team performance cycle and the types of teamwork processes that occur during these times.

Selection, placement, and training. Several researchers have advocated that team member selection, placement, and training be based on a set of team competencies (Cannon-Bowers et al., 1995) or KSAs (Stevens & Campion, 1994) necessary for effective teamwork. The framework and taxonomy support the idea that rather than looking for uniform teamwork skills among all members, employers should be asking what teamwork skills are necessary at what stages of the team performance cycle. In other words, how can teams align their KSAs with teamwork skills necessary at different points in time? Some individuals may be most suited for managing the strategy development process, whereas others may be more talented for action-phase teamwork activities. Along these lines, people with particular KSAs may be chosen for a particular team setting because they are capable of leading that team through transition processes, whereas others might be selected for their ability to contribute to action or interpersonal processes.

For instance, we often hear of the superior "clubhouse presence" (e.g., affect management,

ability to motivate) of certain players to a baseball team's overall effectiveness. Teamwork profiles that delineate the range of processes that occur across different episodes in the team goal accomplishment cycle open the door to a host of tailored training solutions for teamwork issues. These solutions range from team-building interventions designed to foster interpersonal processes to the use of technology (e.g., online displays, communication software) that is implemented to remedy or enhance the teamwork needs of particular teams in context (Bikson, Cohen, & Mankin, 1999).

Further, consideration of the surrounding context in which teams perform uncovers a new set of process taxonomy applications. For example, teams that strategize in relatively stable and predictable environments should be taught formal planning skills, whereas those that perform in turbulent and unpredictable environments should receive strategy training that emphasizes problem diagnosis and impromptu strategy adjustment.

In sum, our framework emphasizes two often-practiced strategies and also illustrates why they are effective. First, creating a well-balanced constellation of KSAs in the team, whether accomplished through selection, placement, and/or training, creates an enabling condition whereby human resources are available for the varied tasks at hand. Second, the move toward self-directed or empowered teams suggests that the members themselves are perhaps best positioned to align those talents to the changing requirement dynamics over the course of episodes. Shifting the orientation from looking for uniformly high "team work skills" to managing team human resources as a constellation of talents should help to enable teams to be successful throughout the changing pressures of performance episodes.

Conclusions

Despite McGrath's (1984b) call for the serious study of team process, there is still no conceptual framework of team process, no agreed-upon definition or set of process dimensions and challenges associated with its measurement. Here, through the development of a conceptual framework of team processes as they relate to team effectiveness, we have identified the content domain for team process. It includes ten lower-

order process dimensions that map onto three higher-order categories. This content domain is embedded within the context of a time-based framework that stipulates the role of process in team effectiveness. By introducing both a framework and related taxonomy of team processes, we aim to clarify current confusion in the literature on the conceptualization and delineation of process variables. Additionally, we hope to spark a more systematic and comprehensive approach to the measurement of team processes. The result should be a better understanding of teamwork that contributes to the development of more effective teams in organizations.

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