

# Group Development and Team Effectiveness

## *Using Cognitive Representations to Measure Group Development and Predict Task Performance and Group Viability*

**Gervase R. Bushe**  
*Simon Fraser University*

**Graeme H. Coetzer**  
*Central Washington University*

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The authors reconceptualize the theory of group development for application to task groups and propose two key sequential phases: membership and competence. A method for measuring developmental progress in task teams based on congruence in group cognitive representations of the team as it is, the ideal team, and the team as it ought to be is proposed. A system for computing group states based on structural connections among member cognitive representations is offered. Measures of group state representations in 49 project teams were collected at beginning, midpoint, and end of each team and related to team effectiveness. Hypotheses based on group development theory predicting effects of convergence and congruence in group state representations on team effectiveness are supported. Further insights into the developmental process of group states are discussed. The authors conclude by arguing for the return of group development theory as an explanation for disparate findings in team research.

**Keywords:** *group development; team effectiveness; shared cognition*

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Since Gersick's (1988, 1989) studies purported to show that classical developmental dynamics were not observable in two samples of task groups, the use of group development theory in organizational behavior (OB) research has virtually

disappeared. Only in group therapy has there been continued use of and evolution in group development theory (Beck & Lewis, 2000; Kieffer, 2001; MacKenzie, 1994; Wheelan, 1997). We argue that in organization studies, group development theory has been hampered by a persistent misunderstanding about what it is and the lack of an efficient method for capturing developmental dynamics in large samples of groups. In this article, we seek to redress both of these issues and offer an integrated theory of group development applicable to work groups and a pencil-and-paper method for assessing the stage of development of a group.

We begin by reviewing the theory of group development, noting that most of it was created and validated out of the observations of self-analytic groups, and offer a revised conception more applicable to the goal-directed, contextually embedded nature of work groups. We connect the theory of group development to the literature on team processes and team effectiveness, and in so doing, we reconcile a number of disparate strands in research on teams in organizations, including the punctuated equilibrium model (Gersick, 1988), the TIP model (McGrath, 1991), and the boundary spanning model (Ancona & Caldwell, 1992) of team effectiveness. We offer a way to think about congruence and discrepancy in group cognition that we argue reflects these developmental stages, and we offer a method of measuring the convergence and divergence of these group-level cognitions over time to track developmental processes in task groups. We hypothesize that developmental dynamics will predict overall group effectiveness, and studying 49 student project teams, we find evidence to support our model.

In the following literature review, we begin by identifying what group development theorists mean by *development* (as contrasted with how it has sometimes been mistakenly construed by OB researchers) and emphasize that development is not something all groups achieve over time but is instead a journey toward optimal functioning only some groups attain. We then go on to review the problems that have arisen by trying to find simple, direct relationships between stages of development and task performance in experimental research and argue for a more appropriate understanding of the impacts group development can be expected to have on group performance and outcomes. From there, we synthesize group development theory and apply it to work groups to arrive at a simple, two-phase model of group development that we argue can predict overall effectiveness of work groups. We next consider the impact that time and the life span of a group has on developmental dynamics and the relationship of development to group outcomes. This is very important in thinking about how to measure the impact of development on group effectiveness. Finally, we describe how we think congruence and convergence in shared cognitions about the group reflect these developmental stages. We identify

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*Gervase R. Bushe, PhD, is an associate professor of management and organization studies in the Segal Graduate School of Business, Simon Fraser University, in Vancouver, British Columbia.*

*Graeme H. Coetzer, PhD, is an assistant professor of management, College of Business, Central Washington University in Lynnwood, Washington.*

how shifts in congruence and convergence in relation to the life span of the group should theoretically be related to group development and effectiveness and offer the hypotheses tested in this study.

## GROUP DEVELOPMENT AND TEAM EFFECTIVENESS

Common understanding of the theory of group development and its relation to team effectiveness has been hampered since the review by Tuckman (1965; Tuckman & Jensen, 1977) caused OB scholars unfamiliar with group development theory to misinterpret previous work, become obsessed with the content of "stages" of development, and lose sight of the underlying processes group development theorists were grappling with. The first and most damaging misunderstanding is to view theories of group development as descriptive rather than as the prescriptive models they actually are. Early group development theorists (e.g., Bennis & Shepard, 1956; Mills, 1964; Schutz, 1960; Slater, 1966) were describing processes they observed in groups that developed. No claim was made that all groups develop, and the often implicit if not explicit sentiment was that not all groups develop to the level of functioning prescribed in these theories and that perhaps most groups do not. Contrary to the image perpetuated in organizational studies (e.g., Caouette & O'Connor, 1998; Chang, Bordia, & Duck, 2003; Chidambaram & Bostrom, 1996; Gersick, 1988), linear stage models of group development do not attempt to describe what happens to a group over time. Rather, they purport to describe a path taken by groups that reach superior levels of team functioning. One explanation for this confusion may be that most group development theorists base their theories on observations of self-analytic groups (e.g., T-groups, therapy groups), which due to expert facilitation and the nature of their task are more likely to become highly developed. It appears that statements such as "Such and such a process was observed over X sample of groups" became translated into a claim that such processes occur in every group. Clearly they do not, and it is probable that most groups we study in organizations and in the laboratory are less than fully developed. If group development exists and we do not control for the various stages of development in the teams we study, then a great deal of unexplained variance could be causing those who are studying teams to get conflicting and confusing results.

Another explanation for the confusion over group development theory in the management literature is that later group theorists use the word *development* to describe linear (Gersick, 1988) or cyclical (Worchel, 1998) group processes. In their theories, there are no claims that development leads to superior functioning or achievement of advanced states of being; rather, they use the word *development* to describe what happens to most or all groups over time. In this article, we are interested in the classical idea of group development as a process that only some groups go through and that helps to explain why those groups are more effective than others.

The second mistake has been to equate these developmental criteria, which are more global descriptions of competence and capacity, with specific outcomes such as a particular instance of task performance. What group development theories

describe is a level of functioning that increases the possibility of team effectiveness while holding all other things constant. There is no claim that other variables, such as task type, team composition, and group context, do not also contribute to any particular instance of task performance. The claim is however that more developed groups will be able to function more effectively across tasks and environmental contexts than less developed ones (e.g., Bennis & Shepard, 1956; Lacoursiere, 1980; Mills, 1964).

Developmental models at the individual, group, and organizational levels tend to share similar conceptions of what constitutes a more developed state. There are at a minimum four common themes: (a) The more developed a group is, the greater the awareness it has of itself—it can talk to itself about itself (Bennis & Shepard, 1956); (b) emotional, reactive behavior decreases, and rational, goal-directed behavior increases (Bion, 1961); (c) the group is better able to actualize its potential (Lacoursiere, 1980); and (d) a more developed group has a greater sense of identity and greater openness to changing that identity (Srivastva, Obert, & Neilsen, 1977).

Group development theory should not therefore be expected to explain the results of laboratory experiments where variables are manipulated to study the effects of various inputs and processes on specific group outputs in task teams that last only a few hours. Neither should it be imputed that the results of such studies are in opposition to group development theory. Rather, group development theory should help to explain the results of studies of team effectiveness of longer-term teams grappling with tasks and problems that are “conceptual versus behavioral” (Chatman & Flynn, 2001) or “creative versus computational” (Polzer, Milton, & Swann, 2002).

### **AN INTEGRATIVE THEORY OF GROUP DEVELOPMENT FOR TASK GROUPS**

The third problem we see in the OB literature on group development since Tuckman has been a tendency to pay more attention to the content of each stage of any particular theory and less attention to the underlying logic of development in each theory. Our experiences working with task teams and self-analytic groups convince us that stage descriptions are an expedient way for researchers to try and describe points along a journey toward development, but it is the journey itself and not the weigh stations along the way where group development theory offers the most important insights into team effectiveness. Our intent in this section is to synthesize the theories of Bales and Strodtbeck (1951), Beck (1974, 1983), Bennis and Shepard (1956), Jacobson (1956), Lacoursiere (1980), Lundgren and Knight (1978), Mann (1967), MacKenzie (1994, 1997), Mills (1964), Moreland and Levine (1982, 1988), Schroder and Harvey (1963), Schutz (1960, 1994), Slater (1966), and Srivastva et al. (1977) to describe the journey toward team effectiveness that is implicit in group development theories. We describe two developmental phases that task teams face in becoming high performing—the phase of membership and the phase of competence—and why completion of the processes in each phase can only be achieved in sequence. For purposes of exposition, we will use the terms *group* and

*team* interchangeably, and our main interest is in exploring group development in work and management teams.

### PHASE 1: MEMBERSHIP

The first phase of development in teams is membership. It is the first phase because until members psychologically join, there is no team but just a collection of individuals who have been grouped together. For a team to develop, its members must want to belong to the team and come to identify with the team. Members enter the team with personal needs and goals, and they implicitly evaluate how this team will aid or get in the way of their personal needs and goals. Members come to the team with already formed identities, and they will seek to have these identities recognized and verified by others (Swann, Milton, & Polzer, 2000). The group structure will have to accommodate the varying role complements that each identity will require for its expression in the group (Srivastva et al., 1977). Members have an image of what a team they want to belong to looks like and implicitly assess the degree to which this team can live up to their ideal image. Researchers have begun to consider the utility of social identity theory for understanding task group behavior (Garcia-Prieto, Bellard, & Schneider, 2003; Lembke & Wilson, 1998), and Bushe (2001) postulates that the level of identification members have with the group is the key differentiating feature of organizational groups as it simultaneously affects both cognitive and emotional responses of members. According to Bushe, many organizational groups exist in preidentity states where members experience the group as one more object in the environment they must deal with in the pursuit of their personal needs and goals. The group's needs and goals are of little concern until members come to identify with the group. In postidentity groups, members identify with the group so that they take the needs and goals of the group into consideration along with their own needs and goals. People strongly identified with a group (e.g., families) can even be willing to sacrifice personal needs for the betterment of the group.

We propose that the dynamic that fuels developmental growth early in a group's life is the gap between perceptions of what is and what individuals want. This includes their beliefs about what the group should be like, what their role and status ought to be, how the task should be defined and managed, and so on. Group development theory assumes that there will be latent conflict between members' expectations of the group and their experiences in the group and unless something is done to reduce these gaps, the group will not develop. We propose that members enter the group with more or less explicit beliefs about what the group should be like and that their decision to fully join depends on their experience of how congruent the group is with their ideal image of the group.

Research has consistently shown that task types moderate group processes and outcomes (Stewart & Barrick, 2000). From a developmental perspective, groups formed to accomplish specific tasks in short time frames may not have to grapple with the membership phase if members can accomplish the task without needing to feel a part of the group. We expect that the clearer and more accepted the task as well

as members' roles and the power relations in the group, the less likely that overt conflict will be required to resolve barriers to membership. Such groups may be able to develop without an overt "storming" stage. When groups exist for longer periods of time, where there is more uncertainty, and where they have to deal with conceptual, creative, open tasks, the developmental phase of membership is more likely to require confrontation and overt conflict. These task and contextual dimensions however do not assure that group development will occur. In either case, what is important is the extent to which members come to psychologically join the group. When that happens the group has passed the developmental hurdle of membership.

This membership phase is encompassed in different stages in different theories of group development. In Schutz (1960), it is referred to as the "inclusion" phase. Other theories tend to cover it in more stages. Most commonly it is viewed as being composed of two distinct stages, variously called "forming and storming" (Tuckman, 1965), "engagement and differentiation" (Mackenzie, 1994), "orientation and dissatisfaction" (Lacoursiere, 1980), and "undifferentiated mass and conflict" (Schroeder & Harvey, 1963). Mills (1964) and Mann (1967) describe this same phase through three stages, which are, respectively, "encounter, testing, and negotiating" and "initial complaining, premature enactment, and confrontation." Jacobson (1956) explores it through four stages: identification, opportunity, differentiation, and communication. Although each of these theories and associated phases has interesting insights into the processes that can take place during the membership phase, concerns about whether this phase occurs through one or four stages are irrelevant to understanding its importance to team effectiveness. The stages of each theory do aid in describing processes that can occur as groups grapple with the membership phase, but too much attention to these can be debilitating if researchers assume that such stages are intended to depict omnipresent phenomena in groups that develop.

For example, the most common phenomenon described in observations of the membership phase is a period of conflict. Those reading these theories literally would take this to mean that for groups to develop they must go through a conflict. That is not how we interpret them. Rather, we see these theories noting that as groups work through the phase of membership, things that create conflict are likely to arise but groups can still develop if they are able to achieve enough psychological membership without conflict. It is not the conflict but the underlying process of achieving psychological membership that is important. What different theories do provide are different but complementary concepts of what is taking place and what drives the development of membership in groups. Slater (1966) and Mills (1964) tell us that members are seeking escape from the anxiety of being part of an undifferentiated mass. Schutz (1960) tells us that people are searching for recognition of their personal significance while making judgments about the significance of others. Beck (1974) tells us that people are searching for at least one other person they can pair up with and form interpersonal bonds. Srivastva et al. (1977) tell us that members are searching for others who will confirm their role identity in the group. Each of these processes is likely a different facet of the membership phase, and each is rife with the potential for conflict. In organizations where team roles are to some extent prescribed due to functional expertise and external authority, we would expect to

find less need for conflict to sort out membership issues than in the wide open ambiguity of self-analytic groups.

## PHASE 2: COMPETENCE

The membership phase is completed when most members have psychologically joined the group by thinking of the group as “we.” They want to be in the group. The next phase of group development then becomes salient to members: the phase of group competence. This is the task of becoming a team that can work together successfully. Swann et al. (2000) make a similar point without explicitly adopting a developmental framework:

When people enter social interaction, their first order of business is to devise an implicit agreement or “working consensus” regarding the identities that each person should assume. Once they reach such agreements, concerns about identity slip from center stage, and people shift their attention to the tasks that brought them together. (p. 238)

Working together effectively requires the development of a governance structure that surfaces issues of power and influence, task allocation, coordination of thought and action, utilization of diversity, clarification of external expectations, and management of group boundaries. Whereas the first task of group development is the establishment of individual identities in the group, the second task of group development is the establishment of the group’s identity (Srivastva et al., 1977). Again, we see nothing inherent in group development theory that states that all groups will complete the competence phase and become effective—just that effective teams do so.

In the first phase of development, the gap that reveals developmental processes is that between people’s preconceived images of an ideal group and their perceptions of the actual group, whereas the second phase is revealed by people’s experience of the gap between others’ expectations of the group and the group’s competence and behavior. Having identified with the group, in the second phase members turn to the tasks, duties, and responsibilities that the group has and make judgments about the group’s current ability and its potential to satisfy others’ expectations—what some might call the group’s efficacy. We argue that if the gap is too wide, members will be forced to take energy away from performance and focus it on the group. If the gap cannot be closed to people’s satisfaction, the group is likely to fragment, identification with the group will reduce, and the group’s potential will be unrealized. If in members’ minds there is little gap between what the group ought to do and what the group actually does, then they will be willing and able to put their collective energy into team performance.

Why one phase follows another is a key question for understanding the logic of development in group development theories. Unfortunately, many theories are obscure on this point, and this has to be inferred from other aspects of the theory. Different reasons can be discerned for why issues of competence arise after membership concerns are sorted out. One is that membership compels members to now take the needs of the group into account (Bales & Strodtbeck, 1951). Because teams are almost always formed to accomplish something, identification with the team leads the

members to become concerned with the group's needs, and so the group turns to how it will accomplish its tasks (Bushe, 2001). Another is that we have interpersonal needs that cause us to construct our relationships in terms of activity: Once we decide that we will be together, we then naturally turn to the question of what we will do together (Schutz, 1960). A third is that the completion of the membership phase, especially where it has required resolution of group conflict, has required erection of a primitive governance structure. Once the dust settles on the membership task, the group turns to elaborating these structures and processes (Srivastva et al., 1977).

The competence phase is found as one or more stages in most theories of group development. It has variously been named the control stage (Bales & Strodtbeck, 1951; Schutz, 1960), leadership/influence (Jacobson, 1956), reorientation and production (Lacoursiere, 1980), internalization (Mann, 1967), and individuation (MacKenzie, 1994). Tuckman (1965) refers to it as the "norming and performing" stages, whereas Schroder and Harvey (1963) call it "initial integration and intensive integration."

In our review of group development theories, the most confusing issue is the place of leadership and authority in a group's development. Some theories place sorting out relations with authority early in the group's life, during the membership phase (Bennis & Shepard, 1956; MacKenzie, 1994; Mann, 1967), whereas others have it being mainly concerned with issues of power and governance (Gibb, 1964; Obert, 1983; Schutz, 1960). From our point of view, issues of power and competence are present during the membership phase but are not the core of the membership task. We note that authority dynamics are central during the membership phase in theories of group development that come from studies of self-analytic groups. We think the degree to which we might find a similar dynamic in organizational task groups depends on the amount of structure and authority already established by the organization that creates them. The more structured, the less sorting out relations with authority will occupy the group's attention. One of the things members consider when going through the process of psychologically joining is how competent they think the group will be and how power will be allocated and used. But this does not become a group-level concern until members start taking the needs of the group into account, and they only do that after they decide to join.

For groups to complete the competence phase, members must agree on goals and objectives as well as establish norms of decision making and processes for allocation of resources, tasks, and responsibilities (Gibb, 1964). Completion of the competence phase comes with members having confidence in the team's ability to succeed at its tasks and feeling satisfied with its outputs. Inevitably this requires the development of some kind of influence hierarchy (Arrow, 1997; Bales & Slater, 1955), and this is why we see power and influence at the group level as central to the competence phase. Here again the nature and quality of leadership has a large impact. In task groups with designated leaders who are able to both help people find comfortable identities and implement governance structures that meet with member approval, a team can rapidly develop through the phases of membership and competence without overt conflicts and be effective. The only downside is that the team is entirely dependent on one member, the leader, for its state of development. If such

a leader leaves the group it often goes right back to the membership phase and loses its competence (Freud, 1951). A group without a designated leader that struggles through its own development will not be dependent on any one member for its continued capacity to function effectively.

Completing the competence phase, especially in groups without designated leaders, requires that members attempt to influence each other and allow others to influence them. Mutual influence requires interpenetration of boundaries and this is why developmentally, a stage of managing interpersonal relationships may follow the completion of the competence phase. This is discussed in many theories of group development that are based on self-analytic groups (e.g., Bennis & Shepard, 1956; Dugo & Beck, 1984; Kieffer, 2001; MacKenzie, 1997; Schutz, 1960). The importance of this phase to team effectiveness is the murkiest area in group development theory. Teams that exist for only a few months may well be able to complete the phase of competence and not have to grapple with interpersonal relationships to effectively complete their work and disband. People forced to work together can do so without confronting interpersonal issues, especially if there is a clear end to their work. For that reason, we consider only the first two phases of our theory of group development as necessary for understanding team effectiveness in task groups of limited duration. However, a long-term group or one that has no predetermined endpoint that completes the phase of competence may have to come to some resolution of relationship issues that are not discussed here to fully develop.

Group development needs to be seen as a journey that is never completed. When we say that a developmental phase is completed, we mean that it is completed well enough for the group to be in a qualitatively different state than it was before. Stretching toward the four developmental criteria described earlier (self-reflective, rational, potential, and identity achieved) is a lifelong task for individuals, and we believe even more so for groups. In addition, things change that bring back developmental issues. When membership changes, the task of membership must be revisited. As the context, tasks, and constraints a team faces change, issues of competence must be dealt with anew. It is probably true however that teams that have come to completion on each of these phases once are better able to complete further iterations of these phases as they arise (Schutz, 1960).

## **TIME, CONTEXT, AND GROUP DEVELOPMENT**

In a series of studies, McGrath and his colleagues (McGrath, 1991; McGrath, Arrow, & Berdahl, 2000) propose that social punctuations of time have important cognitive, emotional, and behavioral consequences for how people make meaning of group events. Gersick's (1988, 1989) finding that teams experience a midpoint crisis is consistent with this point of view. As Chang et al. (2003) and Arrow (1997) point out, none of that is inconsistent with group development theory. Seers and Woodruff's (1997) studies found evidence that this midpoint effect is a result of task pacing under a deadline rather than group development. During the early 1970s it was common knowledge among those who ran self-analytic groups that weekend,

residential T-groups had a common pattern in their pacing. In those that started Friday night and ended late Sunday afternoon, some event would occur Saturday afternoon, usually a conflict, that would lead the group to complete the membership phase and move on to the work of self-study.

It may be that social punctuations of time, like deadlines, interact with the developmental tasks that groups face in predictable ways. Task groups that have a finite duration, where members know that the group will dissolve on a particular date, might be compelled to deal with the membership issue around the midpoint if it has not already been resolved. We suspect that looming deadlines and personal needs combine to push members to want to go on to group competence needs if they have psychologically joined the group. A team of only a few months' duration that has not gone through membership by the midpoint will not be able to complete tasks as effectively as one that has.

In some groups, membership will occur rather easily. In others, an event that could be characterized as storming takes place, and those groups that are able to create interpersonal bonds from their interactions will be more effective than those that do not. They will be in a position where they can deal with the group's need to become competent, whereas those groups that fail to complete the membership phase will struggle along, forced by circumstances to accomplish some objective but without any sort of synergy and therefore with lower task performance (all other things being equal).

When teams enter the competence phase, members shift their attention from what the group is to what the group needs to do. In organizational contexts, that means getting clear what the team's duties, obligations, and responsibilities are and crafting task and decision processes that are appropriate. Following from the logic of entrainment (Ancona & Chong, 1996) in a developmental context, we would expect to see members of effective teams turn to these issues in the second half of the group's life if they have completed the task of membership. Seeking and validating external information (Ancona & Caldwell, 1992) is one requirement for completing the competence phase with teams embedded in organizational contexts. This is not to say that some members could not appear to be seeking external information before a group has completed the membership phase; just that if such information is used at all, it will be to only sort out membership issues until the membership phase is completed. Once the group is in the competence phase, such information is sought and processed in service of the group's duties, obligations, and success.

### **GROUP COGNITIVE DISCREPANCIES AS A REFLECTION OF DEVELOPMENTAL PHASES**

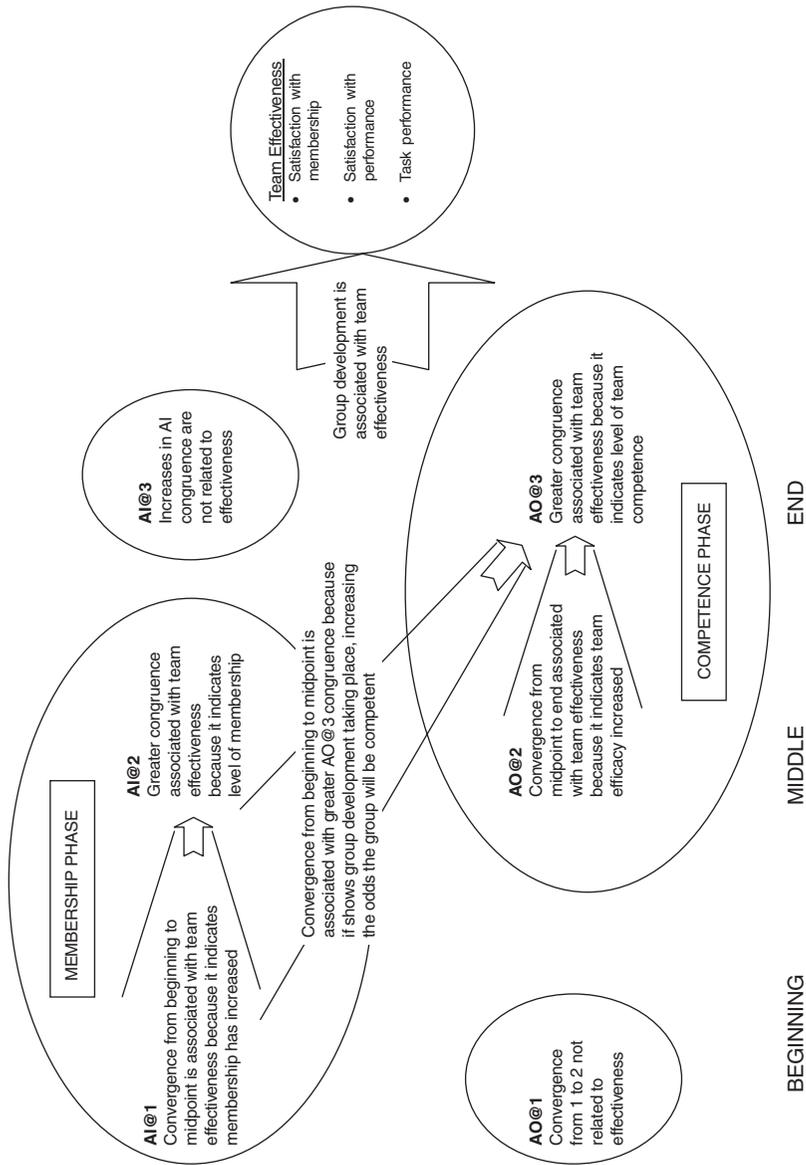
The concept of shared cognition, which is generally defined as shared cognitive structures and processes at the group level, has received increasing attention as a variable that may help to explain variation in team effectiveness (Mathieu, Heffner, Goodwin, Salas, & Cannon-Bowers, 2000; Mohammed & Dumville, 2001). Both the definition of shared cognition and the associated measurement procedure proposed

in this study are the result of revising for use at the group level constructs and measurement procedures used in the study of individual identity, depression, and esteem. These constructs and measurement procedures arise out of individual discrepancy theory (Higgins, 1987, 1989). Individual discrepancy theory proposes that the degree of discrepancy between cognitive domains possessed by an individual, referred to as self-state representations, represent particular emotional situations. The self-state representations are comprised of the actual self-state representation (self-concept) and both the ideal and ought self-state representations (self-guides). The ideal self represents the hopes, aspirations, and wishes for the self, whereas the ought self represents beliefs about the duties, obligations, and responsibilities of the self. Research at the individual level has shown that discrepancies between the self-concept and the self-guides are associated with a variety of affects (Higgins, 1987; Higgins, Bond, Klein, & Strauman, 1986).

This study takes the concept of a self-state representation to the group level by eliciting group members' cognitive representations of their group and assessing the degree of congruence or discrepancy among group members between the images they hold of the group as it is (actual) with the kind of group they would like to be a member of (ideal) and the kind of group they think most appropriate for the task at hand (ought) (Coetzer & Bushe, 2003, 2006). In doing this, we are not using discrepancy theory as a basis for understanding group behavior, but we are however adapting Higgins's method for studying perceptions of gaps that we theoretically relate to developmental phases. In an earlier study (Coetzer & Bushe, 2006), we found that these discrepancies, computed in a way we will describe later, were associated with task performance and group viability in a different sample of teams. We found that there are important practical as well as theoretical differences between attributes of the ideal and the ought group guides and that there usually is quite a bit of difference in the lists people provide. For example, many people think an ideal group is fun, but that may not be relevant to the task at hand (ought). Attributes such as fun may make the group more attractive to join but do not necessarily relate to the group's competence. The ideal group guide generally applies to all groups, whereas the ought group guide is more specific to the actual task and context that the group faces.

Here we test the assumption that the degree of congruence and convergence between the actual and the guides at the group level and the sequence in which these occur reflect the degree to which developmental issues in the phases of membership and competence have been resolved. This is diagrammed in Figure 1 and discussed in detail further on. At the individual level we propose that a person's decision to psychologically join a group is influenced by the gap between a person's image of an ideal group and the specific group and that people are more likely to join and identify with a group that is closer to their ideal than one that is farther away (Reger, Gustafson, Demarie, & Mullane, 1994). We propose that the membership phase can be meaningfully assessed by measuring the congruence between member images of the actual and ideal group.

Measuring the actual-ideal gap in individuals and averaging their scores however does not tell us about the structural properties of a group. To do this, we need a way of assessing the structural properties of the group as a whole. We do this by measuring



**FIGURE 1: Measuring Group Development and Its Impact on Team Effectiveness**

NOTE: AI = actual-ideal group state; AO = actual-ought group state. AO@3 is the congruence between actual and ought group images at Time 3. AI@1 is the congruence between actual and ideal group images at Time 1, and so on.

the degree to which images one member holds of the actual group are congruent (similar, synonymous) with images of the group guides that all other members of the group hold. We then get a measure of the structure of cognitive interconnections that depicts at the group level a state of being that we propose has both cognitive and affective properties. We believe that any measure robust enough to capture group development must do this.

In Coetzer and Bushe (2003) we describe in more detail how this is different from most of the group cognition research, which is concerned with the similarity or dissimilarity of members' cognitive models. Conventional group cognition research would ask how similar are members' images of any group representation and base hypotheses on that. In contrast, we are proposing that the congruence/discrepancy of two different kinds of images held by different group members reflects a more complex reality taking place in a group—what we call a group state. The more one member's depictions of the actual group matches his or her teammates' descriptions of an ideal group (the actual-ideal group state), the easier the path to team membership for all members and the more likely that members have psychologically joined the group. The more discrepancy in these different images, the greater the barriers members face to resolving the issues of the membership phase.

However, in applying the theory of group development to issues of task group effectiveness, especially to those groups with a limited duration, the issue of when images converge is perhaps more critical than the fact that it does take place. Congruence is about the degree of similarity in attributes of the group. Convergence is about the degree of change in congruence over time. Following from the logic of the effects of the social punctuation of time on cognition and social behavior, we expect that only those groups that resolve the membership phase in the first half of the group's life will be able to go through the developmental process of resolving the competence phase and predictably produce better outcomes. Table 1 outlines our model of how phases of group development are related to congruence in group images, convergence of those images in the group's life span, and team effectiveness.

We believe that group development will predict which teams are more effective than others, all other things being equal. At this point we do not know what level of congruence between actual and ideal is required for the membership phase to be completed. To explore our model, we use simple correlational tests of congruence at different points in the team's life span with team effectiveness. For teams with limited life spans, we hypothesize that the membership phase must be completed before the midpoint in the team's life for teams to be effective. This should be reflected in greater congruence at the team's midpoint and greater convergence in those images between the beginning of the group and its midpoint.

*Hypothesis 1:* Congruence in images of the actual and the ideal group at the midpoint will be associated with more effective teams.

*Hypothesis 2:* Convergence in images of the actual and the ideal between the beginning of the group and the midpoint will be associated with more effective teams.

On the other hand, teams that do not accomplish enough convergence in actual-ideal images by the midpoint will not complete the membership phase in time for the

**TABLE 1**  
**Phases of Group Development Related to Shared Images, Life Span, and Team Effectiveness**

<i>Phase of Group Development</i>	<i>Processes Internal to Each Phase</i>	<i>Completed When</i>	<i>Revealed Through Congruence in Images of</i>	<i>Relation to Life Span and Team Effectiveness</i>
Membership	Relationship between personal needs and goals and group requirements, impact on personal identity, sorting through role complements, creation of interpersonal bonds, search for personal significance in the group, reduction in anxiety	Members psychologically join the group	How the group is and member's images of the ideal group	Must be transitioned by the midpoint in the team's life
Competence	Distribution of power and influence, task allocation, coordination of thought and action, utilization of diversity, clarifying external expectations, management of group boundaries	Members believe in the group's efficacy	How the group is and member's images of how the group ought to be	Must be high enough after the midpoint for members to put energy and attention to group tasks

group to fully develop into an effective team. Even if the convergence does eventually take place before the end of the team's life, we expect these teams to be less developed and therefore to be less effective.

*Hypothesis 3:* Convergence in images of the actual and ideal between the midpoint and the end of a team's life will have a negligible association with team effectiveness.

Our theory of group development in task teams states that once members complete the phase of membership, their thoughts turn to the task at hand and the group enters the phase of competence. A different group guide then emerges in salience, that is, the ought. Whereas a person's image of an ideal group is probably stable and portable from group to group, a person's image of how the group ought to be depends on the nature of the task, context, and obligations the group faces. The actual-ought group state depicts the congruence in members' assessments of the group as it is with how it must be to succeed. Groups in which each member's depiction of the actual matches his or her teammates' descriptions of how the group ought to be have resolved to some extent the issue of how to work together. Groups in which these images are highly discrepant face many more problems in resolving issues of the competence phase. Therefore, those teams with more congruent actual-ought group states will be more developed and thus more effective.

*Hypothesis 4:* Congruence in images of the actual and the ought group at the end of the group's life will be associated with more effective teams.

From our developmental perspective, related to task teams of finite duration, we expect that convergence in images of the actual and ought only during the second half of the group, after issues of membership have been resolved, to reflect resolution of underlying processes associated with team effectiveness. Convergence in these images earlier in the group's life does not reflect resolution of competence phase processes and will not be associated with team effectiveness.

*Hypothesis 5:* Convergence in images of the actual and the ought between the midpoint and the end will be associated with more effective teams.

*Hypothesis 6:* Convergence in images of the actual and ought between the beginning and the midpoint of a team's life will have a negligible association with team effectiveness.

As a final test of the group development hypothesis, that completion of the membership phase is required for completion of the competence phase:

*Hypothesis 7:* The amount of congruence in images of the actual and the ought at the end of a team's life will be related to the amount of congruence between images of the actual and the ideal at the midpoint.

The model as a whole is summarized in Figure 1.

## METHOD

### Participants

The method used in this study was consistent with the one described in Coetzer and Bushe (2003, 2006), with the addition of three time points of measurement. Participants were 208 undergraduate students enrolled in a 13-week course on introductory organizational behavior. The average student was 23 years old, and there were 111 women and 97 men in the sample. At the beginning of the course, students were stratified into male and female groups, and then each was randomly assigned to a 4-person project team to equalize gender in each team. There were 52 teams in all. Each of these project teams was expected as a regular requirement of the course to work on a complex business case throughout the semester and submit a paper at the end of the semester that accounted for 25% of each member's final grade. This case was long, difficult, and required enough work that members had to both create a division of labor and coordinate that labor over time, simulating what we believe to be similar dynamics to what one finds in project teams in organizations.

These project teams were also expected to work on other smaller tasks during tutorials each week throughout the semester, but no external evaluation or grading was done to avoid biasing members' assessments of their teams at Time Points 2 and 3. The teams were self-regulating as they decided on their own work processes and schedules, leadership structure, division of labor, and methods for integrating and coordinating individual task contributions.

### Procedure

At three points in time during the 13 weeks—Weeks 3, 7, and 13—each group member was asked to complete the group states questionnaire that was used to measure the group's development. The final questionnaire also included the group viability measures. Questionnaires were completed before any of the student teams received feedback about their performance on the case analysis. The grade assigned for the team paper was used as a measure of task performance.

To promote consistency in the meaning that respondents attached to attributes typically used to describe the group states, all participants engaged in an exercise early in the course where they brainstormed and listed attributes associated with actual groups they had participated in as well as both an ideal group and an appropriate (ought) group. Of course, the same attribute can be an actual, ideal, or ought one. What differentiates them is the person's cognitive frame: An actual attribute describes the group as it actually is, an ideal attribute describes a person's view of ideal groups regardless of tasks or responsibilities, whereas an ought attribute describes what is appropriate given a group's tasks and responsibilities. Once attributes were listed, interpretations of these attributes were elicited from the participants. The discussion of each attribute was concluded with a summary statement by the lecturer that summarized and highlighted the common interpretations of the attribute. A list of these attributes was included as examples within the instruction page that was attached to the questionnaire. Examples of attributes listed were fun,

serious, productive, harmonious, hard-working, flexible, and creative. The complete list is available from the second author.

## Measures

### *Team Effectiveness*

Conventionally, team effectiveness is seen as a combination of task performance and group viability (McGrath, 1984; Sundstrom, DeMeuse, & Futrell, 1990). Hackman (1987) provides a more expansive definition by expanding team viability into two separate constructs: maintaining the ability of team members to work together again in the future and satisfaction of group members' needs. This study follows Hackman in delineating team effectiveness into the following three variables: (a) task performance, (b) satisfaction with membership (a proxy for team member's needs), and (c) satisfaction with team output (a proxy for willingness to work together in the future). Satisfaction with membership is a membership-oriented viability variable, whereas satisfaction with team output is a task-oriented viability variable. The method of assessing effectiveness used here has the added benefit of using data generated from both members (to assess viability) and nonmembers (to assess performance) to provide a rounded assessment.

*Task performance.* The team papers were graded by three teaching assistants (TAs) using specified criteria. We think it is a good measure of performance as this assignment was the task for which the team was formed, and the assessment of performance was exogenous to this study. The TAs who graded the assignment were blind to the research and were only told that we were studying team effectiveness. Data collected were analyzed long after the course was over. There is no reason to suspect their assessments of the team assignments would have been any different without this study.

Due to limitations in TA budgets, we could not have the same papers graded by multiple TAs and control for interrater reliability. We attempted to reduce variation in grading as much as possible through detailed grading sheets containing specific performance dimensions, each of which had an associated scale that was used to indicate the level of performance associated with that particular dimension (available from the second author). To ensure clarity and consistency in the directions provided for completing the business case analysis, all the student teams were provided with the same set of written instructions. This included a handout on effective case writing and the same grading sheet that is given to the TAs. All the assignments were graded on four dimensions, and a final task performance score was derived by adding up the scores on each of the dimensions. The highest score attainable was 80, and the actual scores ranged from 42 to 72, with the average of 56.

*Group viability.* The specific questions used to measure satisfaction with membership and satisfaction with output were developed for this study. Satisfaction with membership was composed of three items: Being a member of this team has been personally satisfying, I would choose this team to work with on similar tasks in the

future, and being a member of this team was a positive experience. Satisfaction with output was also composed of three items: I am satisfied with the final project of this team, we did an excellent job on our case analysis, and the team's final paper is better than what I could have done on my own.

*Group development.* Detailed description of the development and scoring of the group state representation measure can be found in Coetzer and Bushe (2003, 2006). Here we will briefly outline the procedure. The group state representations questionnaire was developed through modification of the Selves Questionnaire developed by Higgins (1987, 1989). Group members were individually asked to list up to 10 attributes that described the actual state of the group at the time of completing the questionnaire. Then they were asked to list up to 10 attributes that they would ideally like their team to possess (based on hopes, wishes, and aspirations that group members have for their group) and finally, up to 10 attributes that they believe the team ought to possess based on the task and performance criteria the team faced. In addition to listing these attributes, respondents were asked to rate each attribute on a 1 (*slightly*) to 4 (*extremely*) scale (hereafter referred to as the extent rating) indicating the extent to which they thought the team possessed or should possess that attribute.

To generate group state scores, we used the Higgins formula (Higgins et al., 1986) that compares both the meaning of the attribute (synonymous, antonymous, or unrelated) and the match in extent rating. A match is one where the extent rating is within 2 out of 4 points of difference; a mismatch is one where the extent rating differs by more than 2 points. The Higgins formula is  $\text{Discrepancy} = [\text{Synonymous Mismatches} + (2 \times \text{Antonymous Mismatches})] - \text{Synonymous Matches}$ . Only those attributes that are considered structurally connected to one another (synonyms and antonyms) are included in the calculation of discrepancy scores. Attributes that have no relation to each other are excluded from this formula because they are not considered to represent structural connections. Given the structure of the formula, a negative score represents greater congruence.

Because we are interested in group development, we needed to construct a measure that was not simply an aggregation of individual results but revealed structural interconnections between members and the group as a whole and therefore measured the group's state at any point in time. To do this, we compared each team member's image of the actual group with a pooled list of every other member's ideal group and then a pooled list of all other members' ought group. This produced two group-level measures at each point in time: the actual-ideal (AI) group state and the actual-ought (AO) group state.

Before computing scores for the actual-ideal group state and actual-ought group state in any time period, redundant attributes contained within each of the pooled team lists of ideal and ought were eliminated. Thereafter, each actual group attribute contained within a team member's list was compared with each of the pooled lists of ideal and ought group attributes generated by the other group members. A trained research assistant did almost all the coding, and the authors did a few groups to train the research assistant. Roget's thesaurus was used initially to aid in identifying some

synonyms and antonyms, but popular and widely accepted usage was mostly used. To ensure we were capturing real structural properties in group cognitions, comparisons were made very conservatively and counted only where different words were clearly synonymous or opposite.

### Data Analysis Procedure

The data were analyzed in various stages. First, data screening was conducted to identify (a) missing data, (b) univariate normality and potential outliers, and (c) bivariate linearity, normality, and potential outliers associated with the hypothesized correlations. Second, the internal reliability of the multiitem Likert scales used to measure the team viability variables (satisfaction with membership and satisfaction with output) were measured using Cronbach's alpha. Third, measures of convergence were calculated by subtracting the congruence score at an earlier time period from the score at a later time period. The more negative a score, the greater the convergence. Fourth, the hypothesized direct relationships among group states and between group states and team effectiveness were measured using Pearson product-moment correlations. Because of the time-oriented, predictive nature of our hypotheses, one-tail significance tests were used to test the hypotheses.

## RESULTS

Descriptive statistics for the variables under consideration in this research and alphas for the group viability scales are in Table 2. Alphas for the two group viability scales ranged from .88 to .93, suggesting high internal reliability. There were no out of range values, and all means and standard deviations were considered plausible. A review of the measures of skewness and kurtosis revealed no significant deviations from normality. A review of the bivariate scatter plots for all the hypothesized correlations revealed some significant deviations from normality on the relationship between congruence in actual and ideal at Time 2 (AI@2) and actual-ought at Time 3 (AO@3). Three team outliers were identified and removed from the sample. Looking at the data on these three groups leads us to guess that they were instances where the groups fragmented and one or two members took on and completed the group task, thus leading to much higher task outcomes than the group state measures or group development theory would predict. As we argued earlier, there are a number of variables other than group development that can affect a group's performance on any specific task. The following analysis therefore presents the results of data on 49 groups. Table 2 also shows the correlations for all variables in the study. As expected, there were moderately strong correlations among the three team effectiveness variables, ranging from .34 to .52.

*Congruence and team effectiveness.* Consistent with Hypothesis 1, task performance was significantly correlated with AI@2 (the congruence between actual and ideal at Time 2) ( $-.30$ ) but not with AI@1 ( $-.06$ ). AI@2 was significantly related to

TABLE 2  
Descriptive Statistics and Correlation Matrix

	Task Performance	Satisfaction With Output	Satisfaction With Membership	AO@3	AO@2	AO@1	AI@3	AI@2	AI@1	Converge AI 1-2	Converge AI 2-3	Converge AO 1-2
Mean	56.16	3.82	3.68	1.02	3.24	3.73	-2.08	-1.61	0.41	-2.02	-0.47	-0.49
Standard deviation	6.87	1.17	1.23	6.58	6.02	0.11	6.42	5.67	6.60	4.58	4.10	6.50
Satisfaction with output	.52**	.88 <sup>a</sup>										
Satisfaction with membership	.43**	.34*	.93 <sup>a</sup>									
AO@3	-.38**	-.43**	-.18									
AO@2	-.12	-.19	-.17	.52**								
AO@1	.03	-.13	-.11	.45**	.70**							
AI@3	-.32*	-.14	-.25	.38**	.37**	.27						
AI@2	-.30*	-.21	-.30*	.34*	.34*	.30*	.78**					
AI@1	-.06	-.06	-.01	.04	.04	.19	.51**	.73**				
Converge AI 1-2	-.29*	-.17	-.36*	.36*	.36*	.09	.23	.18	-.54**			
Converge AI 2-3	-.08	.06	.03	.11	.11	.01	.49**	-.17	-.21	.11		
Converge AO 1-2	-.15	.01	.00	-.06	-.06	-.75**	-.03	-.10	-.23	.21	.09	
Converge AO 2-3	-.29*	-.27	-.02	-.42**	-.42**	-.20	.04	.01	.02	-.01	.05	-.10

NOTE:  $N = 49$ . AI = actual-ideal group state; AO = actual-ought group state. AO@3 is the congruence between actual and ought group images at Time 3, AI@1 is the congruence between actual and ideal group images at Time 1, and so on.

a. Cronbach's alpha.  
\* $p \leq .05$ . \*\* $p \leq .01$ .

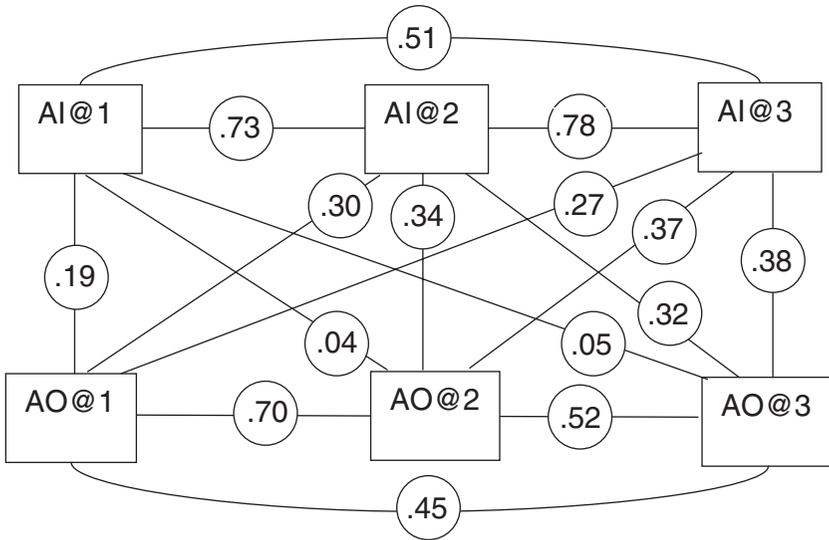
satisfaction with membership at Time 2 ( $-.30$ ) but dropped just below significance at Time 3 ( $-.25$ ), thus providing partial support for Hypothesis 1. Congruence in actual and ideal and satisfaction with output was not significantly related at any time.

Consistent with Hypothesis 4, task performance was significantly correlated with AO@3 (congruence between actual and ought at Time 3) ( $-.38$ ) but not at the midpoint or at the beginning of the team's life. AO@3 was significantly correlated with satisfaction with output at Time 3 ( $-.43$ ) but not at Time 2 or 1. It was not significantly correlated with satisfaction with membership. Consistent with Hypothesis 7, AI@2 was significantly related to AO@3 ( $.34$ ).

These results are consistent with the argument that congruence in actual and ideal at Time 2 predicts task performance and the membership aspect of group viability, whereas congruence in actual and ought at Time 3 is associated with task performance and the satisfaction with output aspect of group viability. These results provide support for Hypotheses 1, 4, and 7 and the overall model of group development.

*Convergence and team effectiveness.* Consistent with Hypothesis 2, convergence between actual and ideal from the beginning to the midpoint is significantly related to task performance ( $-.29$ ) and satisfaction with membership ( $-.30$ ). Consistent with Hypothesis 3, convergence in actual and ideal images between Time 2 and 3 is not significantly related to team effectiveness. Consistent with Hypothesis 5, convergence between actual and ought from the midpoint to the end of the team's life is significantly associated with task performance ( $-.29$ ). It just barely falls outside the range of significance in association with satisfaction with outputs ( $.27 p \leq .06$ ). Consistent with Hypothesis 6, there are no significant relationships between convergence in actual and ought images between Time 1 and Time 2 and team effectiveness. These results show that increasing convergence (or divergence) in the amount of congruence (or discrepancy) in group-level images, measured here as group states, predicts team effectiveness in the manner expected by our model. Furthermore, they show that issues of group viability are affected differently by different group guides, which is consistent with our propositions about the relation of group states to phases of group development. The actual-ideal group state is associated with satisfaction with membership, whereas the actual-ought is associated with satisfaction with outputs (a proxy for the group's competence). This finding supports Hackman's (1987) assertion that although both types of satisfaction are related to group viability, they are quite different variables and are related in different ways to team effectiveness.

*Further exploration of results.* A further exploration of the associations between the different group states and patterns of convergence offers an interesting insight into group dynamics consistent with our developmental model. Figure 2 illustrates the pattern of relationships between the different group states at all three times. Here we see that the group state at Time 1, whether it be actual-ideal (AI@1) or actual-ought (AO@1), is highly correlated with the same group state at the following time periods. For actual-ideal, there is a correlation of  $.73$  in the magnitude of congruence between Time 1 and Time 2. Yet AI@1 is not related to task performance ( $-.06$ ), whereas AI@2 is significantly related to task performance ( $-.30$ ). This suggests that



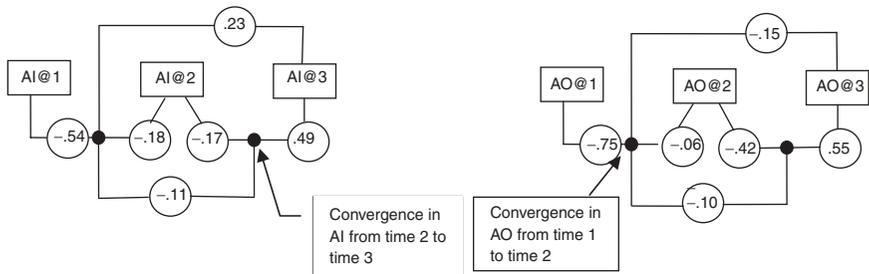
**FIGURE 2: Correlations Among Congruence in Images at Three Points in Time**  
 NOTE:  $N = 49$ . Correlations over .29 are significant. AI = actual-ideal group state; AO = actual-ought group state. AI@1 is the congruence between actual and ideal group images at Time 1, AO@3 is the congruence between actual and ought group images at Time 3, and so on.

the shift in the magnitude of congruence in the actual-ideal group state image from Time 1 to Time 2 is not large but is important enough to make a real difference to team effectiveness.

Looking at the correlation between the two different group state scores, we find no significant correlation between AI@1 and AO@1 (.19). Significant relationships are found at Time 2 (.34) and Time 3 (.38). Furthermore, AI@2 and AO@2 are each significantly related to both AI@3 and AO@3. This suggests that something happens during the first half of the group’s life that leads to an alignment in the magnitude of congruence of both group guides that continues on into the second half of the group’s life.

AI@1 is not significantly related to anything going on in actual-ought images, but AO@1 is significantly related to AI@2 (.30) and drops just below significance with AI@3 (.27). If AO@1 predicts AI@2, our developmental model is thrown into question. The high correlation between AO@1 with AO@2 and AO@3 however suggests the correlation may just be an artifact of the small degree of change that takes place overall in the magnitude of congruence in group states. The partial correlation between AO@1 with AI@2, controlling for AO@2, is .09, thus supporting this interpretation.

Figure 3 illustrates the effects of convergence/divergence from Time 1 to 2 and from Time 2 to 3 within each of the group states. The patterns for actual-ideal and actual-ought are similar with one important difference. What is similar is that the magnitude



**FIGURE 3: Correlations Between Degree of Congruence and Amount of Convergence Within Each Group State Representation**

NOTE: Black dot represents measure of convergence.  $N = 49$ . AI = actual-ideal group state; AO = actual-ought group state. Correlations over .29 are significant. AI@1 is the congruence between actual and ideal group images at Time 1, AO@3 is the congruence between actual and ought group images at Time 3, and so on.

of convergence from Time 1 to Time 2 is strongly and negatively associated with the amount of congruence in group states at Time 1. Examination of the sample means of each group state (Table 2) shows a pattern of increasing congruence over the three time periods, suggesting the reason this relationship is negative is that the more discrepant the group state is at the outset, the more convergence takes place from Time 1 to Time 2. The second common significant finding is the positive relationship between the amount of convergence between Time 2 and Time 3 and the amount of congruence at Time 3.

Where the pattern in convergence and congruence in group states differs is in the relationship between amount of congruence in a group state at Time 2 and the degree of convergence from the midpoint to the endpoint. For actual-ideal, the relationship is insignificant (-.17), whereas for actual-ought, the relationship is significant and negative (-.42). Looking at the absolute change in means between time periods, we see that quite a bit less change takes place in actual-ought discrepancies from Time 1 to Time 2 (.49) than from Time 2 to Time 3 (2.22). For actual-ideal discrepancies the pattern is the reverse, with a greater amount of change from Time 1 to Time 2 (2.02) than from Time 1 to Time 3 (.47). These results are consistent with and further support Hypotheses 2, 3, 5, and 6 and the model of developmental patterns underlying changes in group states proposed in this article.

One last set of relationships of note is the relationships between convergence over time in one group state and convergence and congruence in the other group state. There are no significant relationships, with one important exception: Convergence in actual-ideal from Time 1 to Time 2 is significantly correlated with AO@2 (.6) and AO@3 (.32) but not with AI@2 or AI@3. This is solid support for the sequential theory of development that resolution of the phase of membership, reflected in convergence in the actual-ideal group state before the midpoint, precedes resolution of the competence phase, reflected in AO@2 and AO@3.

## DISCUSSION

In this article, we are not arguing that congruence or discrepancy in group state representations causes effectiveness, although an argument could be made for this. Rather, we argue that our measure of group states reflects enough of what is taking place during the development of task teams to allow for assessment of group development. The degree of congruence in actual-ideal group state representations reflects the degree to which members have structural connections among their cognitions of the ideal group and how this group actually is. We propose that greater congruence reflects a group that has resolved the issues of membership and is able to move on to later phases of development. The degree of congruence in the actual-ought group state reflects the degree to which members have structural connections among their cognitions of the actual group and how the group ought to be given its task and context. Greater congruence indicates the group has resolved the issues of competence and can direct energy and attention to the group's tasks.

We theorize that a group will not do much to resolve issues of the competence phase until the membership phase has found some resolution. In teams with a finite life, the psychology of time and the need for task completion mean that membership issues have to be resolved sometime in the first half of the group's life for it to manage competence issues quickly enough to be effective. Our measurement system allows us to test this by looking at convergence and congruence in actual-ideal attributes (reflecting membership phase dynamics) and actual-ought attributes (reflecting competence phase dynamics) at the beginning, midpoint, and end of the team's life and correlating these with two aspects of team effectiveness: task performance and group viability.

The data and analysis are consistent with this point of view and add additional understanding to developmental dynamics in task teams. What seems to happen is that groups develop a level of congruence in group states early on that does not change that much over the group's life. Strong correlations between level of congruence within each group state at all time periods, with a general trend toward increasing congruence at each time period, indicate that the level of congruence or discrepancy among members at any point in time is somewhat predictable near the outset. There is however some change, and that change reflects something that is fateful for ultimate team effectiveness as initial levels of congruence in group states do not predict team effectiveness. The earliest change that does predict team effectiveness is the amount of convergence in actual-ideal images in the first half of the team's life. The strong negative correlation between actual-ideal at Time 1 and convergence in actual-ideal from Time 1 to 2 suggests that the more discrepant the initial images, the more convergence takes place. The lack of significant association between actual-ideal at Time 2 and convergence in actual-ideal from Time 1 to Time 2 indicates that the amount of convergence does not predict the resulting level of actual-ideal group state. Where the actual-ideal Time 1 to Time 2 convergence shows up as a significant predictor is in the actual-ought group state at Time 2. The actual-ought group state at Time 2 is significantly related to all other group states at Time 2 and Time 3 (though fascinatingly, not to team effectiveness). The data show that

whatever leads to increased convergence in the actual-ideal group state during the first half of a team's life changes the patterns of relationship in the cognitive structure of the group.

We think it means that the more the group has struggled successfully to resolve the membership phase (reflected in convergence in actual-ideal from Time 1 to Time 2), the more members believe the group will become competent (reflected in AO@2) and the more competence phase issues get resolved (reflected in AO@3). Our model posits that there is an as yet unknown level of congruence in the actual-ideal group state that reflects enough resolution of the phase of membership for the group to be able to move on to the issues of competence. A group could start out with members quickly joining in. If it starts out this way, it may not experience a lot more convergence in actual ideal from Time 1 to Time 2 and does not need to. For members in such a group, whether or not the group will be able to become like it ought to be is still unknown—that is a separate developmental step. But for those groups that do go through some change to resolve the membership issue, there is a greater sense among members that they will be able to deal with the competence phase issues to come. Our data show that although the actual-ought group state at Time 2 is not significantly correlated with team effectiveness, by the midpoint an alignment begins to take place in the magnitude of congruence (or discrepancy) in the actual-ought group state that ultimately reflects how developed the group will become and therefore how effective it will be. This is entirely consistent with the theory of group development presented here.

We believe the theory of group development is important for both researchers and practitioners. Properly understood and measured, it could help explain results in many streams of work group research like social identity processes in teams (Lembke & Wilson, 1998), team innovation (West & Anderson, 1996), and group conflict and decision making (Amason, 1996; Jehn & Mannix, 2001). For example, researchers studying diversity have been frustrated by the inconsistent and contradictory results of their research that show member diversity improving group performance in some studies and decreasing performance in others (Guzzo & Dickson, 1996; Milliken & Martins, 1996; Pelled, Eisenhardt, & Xin, 1999). Recent findings on member diversity and team effectiveness by Chatman and Flynn (2001); Ely and Thomas (2001); Kilduff, Angelmar, and Mehra (2000); and Polzer et al. (2002) are consistent with group development theory, which predicts that the more developed a group, the more it can use diversity to increase the team's effectiveness. In an undeveloped group, diversity should decrease the group's effectiveness.

For practitioners, the idea that group development may be predicated on closing gaps between members' expectations and experiences is tantalizing and presents numerous practical possibilities for managers and consultants interested in building high-performing groups. For example, it might explain the impact of appreciative inquiry in teams (Bushe, 2001). By explicitly surfacing and creating discussion of members' images of the ideal team early in a group's life, this initial critical convergence is facilitated. Identifying gaps and congruencies in members' perceptions of the group as it is and as it ought to be could be useful data to feed back to a group trying to increase its effectiveness. For example, the senior author has used similar

techniques to elicit team images among executive teams and feedback pooled lists. These managers appeared motivated to address congruence and discrepancy in shared images and assumed that closing discrepancy gaps would improve team effectiveness.

There are limitations to the study that bear noting. Perhaps the most important is the measure of congruence in group state representations. This is a new method of measuring group cognition, and its assumptions and ramifications need to be further explored. An important threat to the validity of the procedure depends on whether similar (or opposite) words mean similar (or opposite) things to different people. If one member says the actual team is *creative* and another member says the ideal team is *creative*, are they talking about the same thing? How similar does their meaning have to be for there to be a meaningful structural connection between these two members' images of the actual and ideal? Or perhaps more problematic, does one member's *productive* mean the same thing or something different from another member's *efficient*? We attempted to ameliorate this problem by having a discussion with participants where the meaning of words they were likely to use to describe teams were discussed to ensure a modicum in similarity in meaning. Future studies could sample participants on word meanings by asking for synonyms of highly used words by different team members and examining how similar these lists are. Clearly, there is enough similarity in word meaning in this sample for structural connections to be related to group processes and outcomes. Because we were conservative in ascribing synonymous or antonymous matches, our procedure may fail to capture meaningful structural connections and be suppressing the magnitude of the effect. This is clearly an area requiring further investigation.

Some researchers might be concerned with our naturalistic field measure of task performance. Such measures are of concern to scientists who want to be assured of a measure's reliability and ease of replication. From that perspective, this is a limitation of this study as we have no measure of reliability and perfect replication would be difficult. In real life however, task performance is almost always subjectively evaluated idiosyncratically by people external to the group. We believe that any model of team effectiveness needs to be robust enough to predict such varied performance assessments. In this article, we argue that a mark of an effective team is that it understands and meets the external expectations that influence performance assessments. We therefore submit that when studying team effectiveness, using whatever subjective, fuzzily applied assessments that actually occur around meaningful tasks provides a more useful measure of task performance than carefully defined and controlled assessments achievable only under laboratory conditions.

The nature and size of the sample create limitations to generalizing from the results. We do not know if group size (in this case, 4) influences the results. One of the limitations of the measurement system is the need to have trained raters assess the similarity and discrepancy in attributes. This is a long and laborious process. Computing each group state requires analyzing each person's actual against a different pool (the combination of all team members' attributes) to compute a group state score. In a group of 4, with two different group states to compute at three time periods, 24 separate analyses are required. Add 1 more person to the team and 30

separate analyses are required. Adding 2 people increases the number of analyses required by 50%. We are working on a procedure to simplify both the group states survey and the analysis, which will hopefully make it more practical to apply to large groups, larger samples of groups, and sample work teams in organizations.

We believe the findings from this study support further exploration of our model of group development and its implications for task group effectiveness. A pen-and-paper test of group development such as the group states survey could help reinvigorate the study of group development by allowing us to study its impact over large samples. We think group development theory can aid in reconciling contradictory findings in various streams of group effectiveness research and be the basis for practical models that help leaders create effective teams.

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