

# **Leadership Emergence and Group Development: A Longitudinal Examination of Project Teams**

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*This study examined the relationship between individual behavior and leader emergence over the course of a group's development. Results indicated that behaviors related to leader emergence changed over time. Social behaviors were most strongly associated with leader emergence during the beginning of the project, while task behaviors were most strongly associated with leader emergence during later phases. These findings suggest that groups require primarily social-oriented leadership early on; however, needs shift during later phases to task-oriented leadership. The role of talkativeness in leader emergence was also examined and significantly interacted with task-oriented behaviors to predict leader emergence.*

## **INTRODUCTION**

Trends in organizational restructuring over time have resulted in fewer levels of management and increased spans of control, conditions that support team-based organizations in which self-managed work teams (SMWTs) rather than individuals are the core unit (Avolio, Jung, Murry, & Sivasubramaniam, 1996). This trend toward empowerment does not mean that organizations believe that team leadership is unimportant; on the contrary, organizational structures that rely on SMWTs expect that leadership will emerge from within these teams (Karriker, 2005). Consequently, the academic literature has devoted attention to examining how and under what conditions these informal leaders emerge (Wolff, Pescosolido, & Druskat, 2002).

In SMWTs, informal leaders emerge on the basis of the behaviors that they exhibit or the qualities that they are perceived to possess (Taggar, Hackett, & Saha, 1999). However, the needs of teams change over time, so the behaviors and qualities that are perceived as critical to team effectiveness at one point in a team's development may be less important at a different point in time. Therefore, the purpose of this

study is to examine the relative roles that different leader behaviors play in the emergence of leaders over the span of a team's development.

Specifically, we investigated how leadership emerges among team members as a function of group development. By examining the types of behaviors in which members engage at various points throughout a team's development, we expected perceptions of leader emergence to be related to certain leadership behaviors that correspond with specific phases of group development. Longitudinal examination of leader emergence within group development is currently lacking in the academic literature and the current study aims to begin to fill that gap.

### **Emergent Leadership**

In a general sense, leaders fall into two categories: appointed and emergent. Appointed leaders derive their power from the positions of authority that they hold, while emergent leaders are validated through an informal process of acceptance by the group (Hollander, 1974). Emergent leaders are individuals from within a team who are perceived by other members to either possess certain traits or engage in certain behaviors associated with leadership. Having achieved the role only through the willing support of followers, emergent leaders generally find that their influence is more vulnerable; however, they are also able to exert influence with more confidence because of the way in which that influential ability was earned (Hollander, 1974). Given the increasing reliance on SMWTs and the importance of emergent leadership, it is important to understand how emergent leaders earn their influence.

Although most of the research on the emergence of informal leaders has focused on the traits related to their emergence (e.g., Hollander, 1964; Judge, Bono, Illies, & Gerhardt, 2002; Kenny & Zaccaro, 1983; Lord, De Vader, & Alliger, 1986; Riggio, Riggio, Salinas & Cole, 2003), some research has also examined the behaviors related to individuals' emergence into informal leadership roles (e.g., Bales & Slater, 1955; Hollander, 1974; Lord, 1977; Taggar et al., 1999). However, there is still much to be learned about what predicts leader emergence. Specifically, more work needs to be done to better understand how different factors, such as group development, impact who emerges as a leader in SMWTs. Examining behaviors as opposed to traits may be useful when investigating emergent leadership as team member behavior can be modified to match the team's needs at different points during a project.

Decades of research on leadership have shown that effective leaders engage in two primary types of leadership behaviors (Yukl, 2006): task- and social-oriented. Task-oriented behaviors are focused on task completion and goal achievement, and include assigning responsibilities, clarifying tasks, and facilitating others' work. Social-oriented behaviors are intended to strengthen interpersonal relationships and provide a means of support for team members, and include providing recognition, team building, and maintaining relationships. Both of these leader behaviors have been linked to leadership emergence (e.g., Lord, 1977).

Most research on individual behavior and leader emergence has illustrated the importance of task-related behavior. For example, Stein, Hoffman, Cooley, and Pearse's (1979) valence model of leader emergence posits that it is through task-related behaviors (e.g., defining the task, making recommendations, guiding discussion) early in a group's process that members announce their "candidacy" as potential team leaders. These behaviors suggest to the rest of the group that this person is willing and able to help the team, thereby giving valence (or support) to the team's perception of that person as a leader. Similarly, Hollander's (1958) idiosyncrasy credit model of leadership proposes that individuals gain credit by demonstrating competence through their contributions to the group's task as well as by demonstrating loyalty through their conformity to group norms. When sufficient credits are earned, the individual will have adequate status in the group to allow them to influence others to take innovative actions. More recently, Taggar and colleagues (1999) found that six behaviors accounted for 81% of the variance in leader emergence, and most of these corresponded to initiating structure, or task-related, behavior (e.g., performance management, goal setting, synthesis of ideas, participation in team problem solving, involving others).

Despite this focus on task competence and task-related behavior, some emergent leadership research has also recognized the need for socio-emotional leadership. For example, Lord (1977) identified eight task-related and four socio-emotional leadership behaviors, although upon coding these behaviors in problem-solving groups in experimental tasks, they found that the socio-emotional behaviors were performed with much less frequency. Likewise, Bales and Slater (1955) suggested that, although it is more likely that leadership will be attributed to individuals who engage in task-related behaviors, there are situations in which a person exhibiting socio-emotional behavior could emerge as a leader. This suggests that the needs of the team are important in predicting leader emergence, and highlights the need to further examine the circumstances in which each type of leader behavior is most effective.

There is some evidence that the specific situation faced by team members will have an impact on the type of leader that emerges (Lord, Foti, & de Vader, 1984; Stogdill, 1948). Consequently, leadership behaviors that are needed early in the team's development may not be the same qualities needed as the team evolves and approaches its deadline. Members are likely to be perceived as leaders by their teammates as a result of their ability to handle specific situations as they arise (Barlund, 1962) and how capably they are able to meet the team's task and social needs (Johnson & Bechler, 1998). When unique problems are encountered by a group, the member who possesses the relevant skills to get the team through the problem will likely use those skills to assist the group, and as a result, will be perceived as leading the team. Those who emerge are typically more adept than other team members at perceiving team needs and selecting appropriate actions to fill those needs (Zaccaro, Foti, & Kennedy, 1991).

In order to predict who will be considered a team leader, it is necessary to identify what the needs of the team are throughout its life. Various stages of group development are characterized by different team needs. Determining what those needs are and identifying the corresponding leader behaviors will increase our understanding of emergent leadership in SMWTs.

### **Group Development**

As SMWTs became more prevalent in organizations, researchers began to reexamine how these teams developed, finding that not all teams progressed through the linear stages proposed by Tuckman (1965; forming, storming, norming, and performing). New models arose to explain the developmental process in temporary work teams. These non-sequential models offer an alternate way of understanding group development, particularly for autonomous temporary project teams. Although there are a number of non-linear models, perhaps the most commonly known and best understood is the Punctuated Equilibrium Model (Gersick; 1988).

Gersick's (1988) punctuated equilibrium model suggests that teams do not develop in a universal sequence of stages, but instead develop behavioral tendencies suddenly and work within these behavioral parameters for long periods without major change. This model is not a general model of group development for all teams; rather, it was developed to explain the task activities of autonomous work teams with specific tasks and explicit deadlines. Gersick's theory is that these groups develop quickly, maintain a certain level of work and pattern of behavior, and then experience a sudden revision to the framework in the group, which leads to a new level of activity and a new behavior pattern. In the different phases of the team's development, different leadership behaviors are likely required. Those who display the desired qualities when they are needed by the group will likely be considered a leader by their teammates (Zaccaro et al., 1991). Thus, we expected to see development occur in three distinct phases characterized by different leadership needs and resulting in the emergence of different types of leaders.

According to Gersick's model, the first phase of development (Phase 1), begins at the starting point of the project and is marked by a tone of work that is typically unfocused and unproductive; nonetheless, the group persists with the initial approach, generally a process that was proposed in the initial meeting, until the members are ready to question this approach, which typically occurs around the midpoint of the group's life.

During Phase 1, we expected leadership behaviors to be focused on social development more than task development and that this would persist until the temporal midpoint of the team's assignment

(Chang et al., 2003). The first phase is a time of getting to know other team members and determining how the group will perform together. Until members feel comfortable working with their teammates, little progress on the task will be made. Therefore, during this phase, we expected that social-oriented behavior would be associated with team leadership, and that task-oriented behavior would be perceived as less important and less critical. We proposed that a social-oriented leader would emerge during Phase 1 of the group's development.

*Hypothesis 1a. Social-oriented leadership behaviors will be related to leader emergence in Phase 1 of team development.*

*Hypothesis 1b. Social-oriented leadership behaviors will be more important than task-oriented leadership behaviors in predicting leader emergence in Phase 1 of team development.*

At the midpoint transition, groups tend to make fundamental changes in their work, moving forward due to a concentrated burst of revolutionary change. Members tend to be more receptive to others' attempts to redirect the team's behaviors at the midpoint, than they are before and after this transition period. Whether the awareness of time is the trigger for or the result of the midpoint transition, it is at this point in the group's development that the group begins to rethink the task, make adjustments to goals, and change the way they work together. Team members likely feel ready, at this point, to adopt a new approach to the task and abandon earlier approaches (Gersick, 1989). Without a team member who is sensitive to the needs of the group or without the necessary skills among group members to help facilitate the change, teams can miss this crucial change point.

New approaches formed during the midpoint transition are then carried through a second major phase of development (Phase 2; Gersick, 1988). During this phase, teams focus on solving task problems, and are less concerned with solving interaction problems. Seers and Woodruff (1997) also found that group work performance was significantly greater after the midpoint.

During Phase 2, groups begin to move past social needs and begin to focus on task development, showing marked increase in productivity (Chang et al., 2003). It is at this point that the team begins to focus primarily on the task itself; as the deadline looms, members become more concerned with needs related to task-completion, and less concerned with the social cohesion of the team. Team members realize that there is little time left to sort out individual differences. They recognize the urgency of completing the task by the deadline, and start thinking about ways to accomplish the goal. Therefore, we expected that task-oriented behaviors, such as idea formation and structure generation, would be associated with team leadership, and be more important to team leadership than social-oriented behaviors. We proposed that a task-oriented leader would emerge during Phase 2 of the group's development, the period following the midpoint transition.

*Hypothesis 2a. Task-oriented leadership behaviors will be related to emergent leadership in Phase 2 of team development.*

*Hypothesis 2b. Task-oriented leadership behaviors will be more important than social-oriented leadership behaviors in predicting emergent leadership in Phase 2 of team development.*

The final noticeable transition point identified was a period called "completion" (Phase 3; Gersick, 1988). This transition is characterized by a burst of activity near the end of the project in which groups rushed to finish their work and make final adjustments just before the deadline.

During this final phase, which occurs directly before the project deadline, teams experience a final burst of activity, focusing on arranging all of the completed work to meet the requirements of whoever will critique it (Gersick, 1988). Behaviors during this phase may involve editing materials to external standards, reviewing and revising the project, and making last-minute adjustments to the work in preparation for the deadline. Given the urgent task-related activities of this phase, we again expected that

task-oriented behaviors would be associated with team leadership, and that a task-oriented leader would emerge during Phase 3.

*Hypothesis 3a. Task-oriented leadership behaviors will be related to emergent leadership in Phase 3 of team development.*

*Hypothesis 3b. Task-oriented leadership behaviors will be more important than social-oriented leadership behaviors in predicting emergent leadership in Phase 3 of team development.*

## **METHODS**

### **Participants**

Participants were 109 students (66 males and 43 females) enrolled in four identical undergraduate business courses at a medium-sized university in the Southeast, and assigned to 28 groups consisting of 4 to 5 members to work on a semester-long class project. Participants were mostly Caucasian 95.4%, had an average age of 21.64 ( $SD=.33$ ), and earned extra course credit for their participation.

### **Procedure**

Teams completed a semester-long group project, the duration of which was approximately 14 weeks. The project required that teams design an organization with respect to several course-related topics. At the end of the semester, teams submitted a written report and gave an oral presentation to the class. Thus, this task aligns with the conditions for which Gersick's group development model is appropriate, in that teams were temporary, autonomous project teams, with no history.

A survey assessing task- and social-oriented leadership behaviors, talkativeness, and perceptions of overall leader emergence was administered at three times during the project in an attempt to capture the dominant behaviors during each of the three phases: during Week 4 (Phase 1), during Week 10 (Phase 2), and on the day of the project deadline (Week 14, Phase 3). A round-robin design was employed such that each team member rated each of his/her teammates at all three phases.

### **Measures**

#### *Leadership Behaviors*

Perceptions of members' leadership behaviors were measured using seven items that assessed two types of leadership behavior: task-oriented and social-oriented leadership behaviors. Participants were asked to indicate the degree to which they perceived that each of their teammates displayed certain leadership behaviors using a 5-point scale. These items were adopted from the Initiating Structure and Consideration subscales of the Leader Behavior Description Questionnaire-Form XII (Stogdill, 1963). Because participants were asked to rate themselves and each of their teammates on each of the leadership behaviors, items were combined (based on similarity) to prevent fatigue. As such, three items were used to assess task-oriented leadership behaviors (sample item: "S/he scheduled work to be done; assigned group members to particular tasks; decided what should be done and how it should be done") and four items were used to assess social-oriented leadership behaviors (sample item: "S/he was friendly and approachable; looked out for the personal welfare of group members; did little things to make it pleasant to be a member of the group"). The internal consistency reliability estimates for both subscales were acceptable at all times, see Table 1.

#### *Leader Emergence*

Leader emergence was assessed by measuring team members' perceptions of an individual's overall leadership. Participants were asked to rate, on three items, the overall degree to which they perceived each team member as a leader using a 5-point scale. Example items included "I consider this person a team leader" and "Our group receives guidance and direction from this person". The internal consistency reliability estimates for this measure were acceptable for all times, see Table 1.

## Control Variables

### Talkativeness

People can also be perceived as leaders simply because they are the most vocal or outspoken (Jaffee & Lucas, 1969; Jones & Kelly, 2007; Mullen, Salas, & Driskell, 1989). Thus, a measure for talkativeness was included to control for this effect. Participants rated each teammate on three items assessing talkativeness using a 5-point scale. Example items included “I see this person as talkative” and “This person dominates most discussions.” The internal consistency reliability estimates were judged to be adequate, see Table 1.

**TABLE 1**  
**DESCRIPTIVE STATISTICS AND CORRELATIONS**

| Variable                    | 1    | 2    | 3     | 4     | 5     | 6     | 7     | 8     | 9     | 10    | 11    | 12    | 13    | 14    |
|-----------------------------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1. Gender                   | --   |      |       |       |       |       |       |       |       |       |       |       |       |       |
| 2. Grade Point Average      | .14  | --   |       |       |       |       |       |       |       |       |       |       |       |       |
| 3. Leadership-Phase 1       | -.06 | .15  | (.83) |       |       |       |       |       |       |       |       |       |       |       |
| 4. Social-Oriented-Phase 1  | -.02 | .08  | .56   | (.75) |       |       |       |       |       |       |       |       |       |       |
| 5. Task-Oriented-Phase 1    | -.08 | .13  | .50   | .26   | (.83) |       |       |       |       |       |       |       |       |       |
| 6. Talkativeness-Phase 1    | -.05 | .08  | .65   | .34   | .36   | (.75) |       |       |       |       |       |       |       |       |
| 7. Leadership-Phase 2       | -.05 | .20  | .47   | .31   | .32   | .32   | (.83) |       |       |       |       |       |       |       |
| 8. Social-Oriented-Phase 2  | .05  | .01  | .38   | .49   | .20   | .24   | .44   | (.75) |       |       |       |       |       |       |
| 9. Task-Oriented-Phase 2    | -.05 | .09  | .43   | .17   | .51   | .19   | .68   | .32   | (.88) |       |       |       |       |       |
| 10. Talkativeness-Phase 2   | -.04 | .16  | .29   | .18   | .27   | .42   | .62   | .35   | .44   | (.76) |       |       |       |       |
| 11. Leadership-Phase 3      | -.07 | .18  | .45   | .28   | .28   | .32   | .51   | .29   | .40   | .39   | (.84) |       |       |       |
| 12. Social-Oriented-Phase 3 | -.02 | .02  | .33   | .35   | .09   | .18   | .34   | .45   | .22   | .26   | .57   | (.79) |       |       |
| 13. Task-Oriented-Phase 3   | -.05 | .12  | .39   | .15   | .39   | .24   | .46   | .17   | .56   | .34   | .70   | .41   | (.85) |       |
| 14. Talkativeness-Phase 3   | -.03 | .21  | .30   | .15   | .26   | .30   | .42   | .26   | .37   | .53   | .66   | .30   | .48   | (.66) |
| Mean                        | 0.40 | 3.11 | 3.48  | 4.03  | 2.78  | 3.39  | 3.51  | 4.01  | 3.01  | 3.47  | 3.97  | 4.40  | 3.85  | 3.75  |
| Standard deviation          | 0.49 | 0.44 | 0.92  | 0.76  | 0.96  | 0.88  | 0.95  | 0.80  | 1.08  | 0.87  | 0.94  | 0.74  | 1.00  | 0.85  |

Note: Gender is coded 0=male, 1=female; predictor correlations are team and target centered; Cronbach's alpha presented on the diagonal; correlations greater than .09 are significant at .05; correlations greater than .12 are significant at .01.

### *Gender*

Although findings are mixed (see Gershenoff & Foti, 2003, for a brief review), some research has suggested that gender is related to leader emergence. In a meta-analysis of 58 studies, Eagly and Kolb (1991) found that men were more likely to emerge as leaders than women, especially in short-term project groups. The meta-analysis also revealed that the type of leadership mattered with regard to gender and leader emergence; males tended to be more likely to emerge when task leadership was considered, whereas women emerged more often when social leadership was considered. Therefore, we included gender as a control variable in the current study. Gender was self-reported at the beginning of this project.

### *Grade Point Average (GPA)*

There is some evidence to suggest that intelligence is also related to leadership emergence (e.g., Johnson & Bechler, 1998; Lord et al., 1984). For example, Lord et al. (1984) found intelligence to be an attribute that individuals tended to see as prototypical of leaders across many different situations. Through a process of elimination, team members who are perceived as unintelligent may be eliminated by peers from consideration for an emergent leadership role (Johnson & Bechler, 1998). Therefore, we included GPA as a proximal measure of intelligence. GPA was self-reported at the beginning of the project.

## **RESULTS**

### **Preliminary Analysis**

Employing a round-robin design in which each participant was rated by each of his/her teammates at all three times introduced two levels of interdependence among the data. First, ratings were nested within teams. That is, all of the teammate ratings occurred within a team context and introduced team-level interdependence. A second level of dependence was introduced by asking each teammate to rate all other members of the team. This design resulted in each participant being rated by 3 or 4 teammates, depending on the team's size, and introduced target-level interdependence. Thus, these relationships among the data violated the assumption of independence necessary for utilizing traditional regression techniques.

To determine the need to model this data interdependence, a maximum likelihood estimation multilevel modeling (MLM) procedure was used to compute interclass correlation coefficients (i.e., the expected correlation between the scores of two participant from the same level) and design effects (i.e., an estimate of the multiplier that needs to be applied to standard errors to correct for the negative bias that results from nested data; see Peugh, 2010). Table 2 shows the interclass correlation coefficients and design effects due to the nested nature of the data within team and participant. Given that interclass correlation coefficient values between .05 and .20 are common in cross-sectional MLM in social science research studies and design effect estimates greater than 2.0 are an indication of a need to model the interdependence of the data (Muthén, 1994; Muthén & Satorra, 1989), these results suggest the need for MLM.

The first step in MLM is to examine the change in model fit of the unconditional or random intercepts only model (i.e., a model that allows the intercepts to vary across the different nested levels) compared to a model that uses only the grand mean (see Peugh, 2010). Results showed that the change in -2 log likelihood ( $\Delta$ -2LL) fit statistics from grand mean to random intercepts models, which allowed the intercepts to vary across both teams and targets, improved model fit (Phase 1  $\Delta$ -2LL<sub>(2)</sub> = 73.59,  $p$ -value < .001; Phase 2  $\Delta$ -2LL<sub>(2)</sub> = 77.71,  $p$ -value < .001; Phase 3  $\Delta$ -2LL<sub>(2)</sub> = 51.73,  $p$ -value < .001). This indicated that allowing the intercepts to vary across both the team- and target-levels improved the prediction of leader emergence and provided further evidence for the need to model the interdependence of the data. Thus, these random intercepts models were used as baseline models to which predictors and control variables were added to test the study's hypotheses.

**TABLE 2**  
**INTERCLASS CORRELATION COEFFICIENTS AND DESIGN EFFECTS**  
**FOR NESTED DATA**

| Phase and Data Level           | <i>ICC</i> | Design Effect |
|--------------------------------|------------|---------------|
| <u>Phase 1</u>                 |            |               |
| Team-Level Random Intercepts   | .06        | 1.21          |
| Target-Level Random Intercepts | .45        | 2.81          |
| <u>Phase 2</u>                 |            |               |
| Team-Level Random Intercepts   | .06        | 1.19          |
| Target-Level Random Intercepts | .45        | 2.80          |
| <u>Phase 3</u>                 |            |               |
| Team-Level Random Intercepts   | .10        | 1.32          |
| Target-Level Random Intercepts | .36        | 2.42          |

The next step was to add the predictor and control variables to the random intercepts model as fixed effects (i.e., models that hold the slopes constant between the predictor and outcome across the team and target levels) to determine if they collectively improved the prediction of emergent leadership over the baseline random intercepts model. The  $\Delta$ -2LL statistics show that adding the fixed predictors to the random intercepts models improved the model fit (Phase 1  $\Delta$ -2LL<sub>(5)</sub> = 592.35,  $p$ -value < .001; Phase 2  $\Delta$ -2LL<sub>(5)</sub> = 614.56,  $p$ -value < .001; Phase 3  $\Delta$ -2LL<sub>(5)</sub> = 745.86,  $p$ -value < .001), indicating that adding the covariates improved the prediction of leader emergence at all three times.

Finally, the predictors and control variables were entered as random effects (i.e., the slopes for these covariates were allowed to vary within the team- and target-levels) into the previous fixed effect models. Results indicated that these random slope models failed to improve fit (Phase 1  $\Delta$ -2LL<sub>(5)</sub> = 1.58,  $p$ -value = .904; Phase 2  $\Delta$ -2LL<sub>(5)</sub> = 6.40,  $p$ -value = .269; Phase 3  $\Delta$ -2LL<sub>(5)</sub> = 0.33,  $p$ -value = .997), indicating that allowing the relationships among the variables to vary within the team- and target-levels failed to improve the prediction of leader emergence.

Together, the results from these analyses suggested that there were significant mean-level differences at both the team- and target-levels, but that the relationships between the outcome, predictors, and control variables were invariant across these levels. Based on these findings, the predictor variables were team- and target-centered before intercorrelations were computed to account for the demonstrated interdependence (see Table 1), and hypothesis testing was carried out using team- and target-level random intercepts with fixed covariates models.

### **Determining Importance**

In order to determine the importance of the predictors, dominance analyses (Azen & Budescu, 2003; Budescu, 1993) were conducted using the pseudo  $\Delta R^2$  values from the fixed effects models. Given the study's focus on the relationship between social- and task-oriented behaviors and leader emergence, the dominance analysis utilized pseudo  $\Delta R^2$  values that represented the amount of variance accounted for by the covariates beyond the team- and target-level effects (i.e., the variance attributable to the team- and target-level random intercepts). These pseudo  $\Delta R^2$  values were then used in a dominance analysis that produced (1) the general dominance weight for each predictor for every outcome, which sum to the overall pseudo  $\Delta R^2$ , and (2) a relative importance score, which is the percentage of explained variance accounted for by the predictor, and which sum to 100%. As suggested by Tonidandel, LeBreton, and Johnson (2009), 95% confidence intervals were computed around the dominance weights using the bias

corrected accelerated method for generating the bootstrapped confidence intervals and 10,000 bootstrap samples.

### Tests of Hypotheses

The first set of hypotheses predicted that social-oriented behaviors would be related to leader emergence at Phase 1 and that they would be more important than task-oriented behaviors during the first phase. Results from the MLM analysis indicated that social-oriented leadership behaviors were a significant predictor of leader emergence in the first phase of team development ( $b = .32, p < .001$ ; see Table 3), supporting Hypothesis 1a. While social-oriented leadership behaviors were relatively the most important predictor, accounting for 37.0% of the change in the pseudo  $\Delta R^2$  value compared to 26.6% for task behavior, 95% CIs of the dominance weights of social and task behaviors overlapped, indicating they were not significantly different from one another (see Table 3). Thus, Hypothesis 1b was partially supported.

**TABLE 3**  
**HIERARCHAL RESULTS FOR THE FIXED MLM AND INTERACTION RESULTS**

| Predictors                          | Fixed Models        |                        |                    | Interaction Models |                     |                        |
|-------------------------------------|---------------------|------------------------|--------------------|--------------------|---------------------|------------------------|
|                                     | Pseudo $\Delta R^2$ | $b$                    | Dominance Analysis | Dom Weight 95% CI  | Pseudo $\Delta R^2$ | $b$                    |
| <u>Phase 1</u>                      | .16 <sup>c</sup>    |                        |                    |                    | <.01                |                        |
| Gender                              |                     | -.02(.07)              | <.01(.001)         | -.001, .001        |                     | -.03(.07)              |
| Grade Point Average                 |                     | .02(.08)               | <.01(.001)         | -.001, .001        |                     | .13(.08)               |
| Social-oriented leadership behavior |                     | .32(.04) <sup>c</sup>  | .06(.370)          | .029, .087         |                     | .47(.17) <sup>b</sup>  |
| Task-oriented leadership behavior   |                     | .23(.04) <sup>c</sup>  | .04(.266)          | .018, .065         |                     | .27(.13) <sup>a</sup>  |
| Talkativeness                       |                     | .55(.04) <sup>c</sup>  | .06(.364)          | .027, .086         |                     | .75(.15) <sup>c</sup>  |
| Social x Talkativeness Interaction  |                     |                        |                    |                    |                     | -.05(.04)              |
| Task x Talkativeness Interaction    |                     |                        |                    |                    |                     | -.01(.04)              |
| <u>Phase 2</u>                      | .19 <sup>c</sup>    |                        |                    |                    | .01 <sup>b</sup>    |                        |
| Gender                              |                     | -.06(.08)              | <.01(.001)         | -.001, .001        |                     | -.06(.08)              |
| Grade Point Average                 |                     | .23(.08) <sup>b</sup>  | <.01(.002)         | -.001, .001        |                     | .23(.08) <sup>b</sup>  |
| Social-oriented leadership behavior |                     | .20(.04) <sup>c</sup>  | .03(.149)          | .008, .049         |                     | -.04(.14)              |
| Task-oriented leadership behavior   |                     | .32(.04) <sup>c</sup>  | .10(.493)          | .054, .136         |                     | .69(.12) <sup>c</sup>  |
| Talkativeness                       |                     | .45(.04) <sup>c</sup>  | .07(.355)          | .039, .097         |                     | .48(.13) <sup>c</sup>  |
| Social x Talkativeness Interaction  |                     |                        |                    |                    |                     | .06(.04)               |
| Task x Talkativeness Interaction    |                     |                        |                    |                    |                     | -.10(.03) <sup>b</sup> |
| <u>Phase 3</u>                      | .28 <sup>c</sup>    |                        |                    |                    | .01 <sup>b</sup>    |                        |
| Gender                              |                     | -.11(.06) <sup>a</sup> | <.01(.002)         | -.001, .002        |                     | -.10(.05)              |
| Grade Point Average                 |                     | .11(.06)               | <.01(.001)         | -.001, .001        |                     | .10(.06)               |
| Social-oriented leadership behavior |                     | .31(.04) <sup>c</sup>  | .06(.222)          | .028, .095         |                     | .26(.14)               |
| Task-oriented leadership behavior   |                     | .37(.03) <sup>c</sup>  | .11(.405)          | .070, .153         |                     | .61(.11) <sup>c</sup>  |
| Talkativeness                       |                     | .46(.04) <sup>c</sup>  | .10(.370)          | .068, .136         |                     | .68(.14) <sup>c</sup>  |
| Social x Talkativeness Interaction  |                     |                        |                    |                    |                     | .01(.04)               |
| Task x Talkativeness Interaction    |                     |                        |                    |                    |                     | -.07(.03) <sup>b</sup> |

Note: Fixed model pseudo  $\Delta R^2$  is change in the pseudo  $R^2$  values from team- and target-level random intercepts models to the fixed effects models. Unstandardized coefficients are presented with standard errors in parentheses are presented in the first column. Numbers in the dominance analysis column are general dominance weight with the relative importance scores presented in parentheses. Dominance weight 95% CI were the result of 10,000 bootstrap samples. Interaction model pseudo  $\Delta R^2$  is change in the pseudo  $R^2$  values from fixed effects models to the interaction models. <sup>a</sup> $p < .05$ , <sup>b</sup> $p < .01$ , <sup>c</sup> $p < .001$

The second set of hypotheses predicted that task-oriented behaviors would be related to leader emergence at Phase 2, and that they would be more important than social-oriented behaviors during the second phase. Results from the MLM analysis demonstrated that task-oriented leadership behaviors were a significant predictor of leader emergence in the second phase of team development ( $b = .32, p < .001$ ; see Table 3), supporting Hypothesis 2a. Furthermore, results indicated that task-oriented leadership behaviors were relatively the most important predictor, accounting for 49.3% of the change in the pseudo  $\Delta R^2$  value compared to 14.9% for social behavior. Additionally, the 95% CIs of the dominance weights of task and social behavior did not overlap (see Table 3) with the values for task-oriented behaviors being significantly higher. Thus, Hypothesis 2b was supported.

The third set of hypotheses predicted that task-oriented leadership behaviors would be related to leader emergence in Phase 3, and that they would be more important than social-oriented leadership behaviors during the third phase. Results from the MLM analysis demonstrated that task-oriented leadership behaviors were a significant predictor of leader emergence ( $b = .37, p < .001$ ; see Table 3), supporting Hypothesis 3a. However, while task-oriented leadership behaviors were relatively the most important predictor, accounting for 40.5% of the change in the pseudo  $\Delta R^2$  value compared to 22.2% for social behavior, the 95% CIs of the dominance weights of task and social behavior overlapped (see Table 3). Thus, Hypothesis 3b was partially supported.

### **Post Hoc Analyses**

The results of the MLM and dominance analyses indicated that, while social- and task-oriented leadership behaviors were significant indicators of leader emergence, talkativeness was also found to be an important predictor of leader emergence at all three phases. This result suggests that merely talking during all three phases of the group's development contributes to impressions of leadership, perhaps regardless of the content of that talk. To determine if the content of this talkativeness was meaningful during all three phases, the interactions between talkativeness and social- and task-oriented leadership behaviors were examined.

At Phase 1, the interaction terms in the MLM model were not found to be significant (see Table 3). However, during Phases 2 and 3 the task-oriented behavior and talkativeness interaction terms were found to be significant. To help interpret these interactions, the conditional effects were examined to determine how the relationship between task-oriented behaviors and leader emergence was changed along the different values of talkativeness. As seen in Table 4, the relationship between task-oriented behaviors and leader emergence became slightly weaker as individuals talked more at both the second and third phases. That is, during both Phase 2 and Phase 3 of group development, the relationship between task-oriented leadership behavior and emergent leadership was strongest when an individual talked less (i.e., the talkativeness value at the 10<sup>th</sup> percentile); the relationship became weaker as the individual was more talkative (i.e., talkativeness values at the 50<sup>th</sup> percentile), and continued to weaken as the individual talked a lot (i.e., talkativeness values at the 90<sup>th</sup> percentile).

**TABLE 4**  
**MODERATING EFFECTS OF TALKATIVENESS ON THE RELATIONSHIP BETWEEN**  
**TASK-RELATED BEHAVIORS AND EMERGENT LEADERSHIP**

| Values of<br>Talkativeness  | <i>Phase 2</i><br><i>Effect</i> | <i>Phase 3</i><br><i>Effect</i> |
|-----------------------------|---------------------------------|---------------------------------|
| 10 <sup>th</sup> percentile | .44                             | .42                             |
| 25 <sup>th</sup> percentile | .37                             | .39                             |
| 50 <sup>th</sup> percentile | .30                             | .35                             |
| 75 <sup>th</sup> percentile | .27                             | .30                             |
| 90 <sup>th</sup> percentile | .20                             | .25                             |

*Notes:* Values of the moderator (talkativeness) at 10<sup>th</sup>, 25<sup>th</sup>, 50<sup>th</sup>, 75<sup>th</sup>, and 90<sup>th</sup> percentile were entered into the MLM and the relationship between task-related behaviors and emergent leadership were computed. The conditional relationship between task-oriented behaviors and emergent leadership are reported Phase 2 & 3 Effect columns.

## DISCUSSION

The purpose of this study was to examine leadership emergence over the course of the group development process in SMWTs working on a short-term project. The punctuated equilibrium model (Gersick, 1988) was used as a basis for understanding how the relationship between task- and social-oriented behaviors and leader emergence might change over the duration of a team's development process.

Result indicated that social and task behaviors were related to leader emergence at all three phases. This suggests that both social- and task-oriented behaviors are needed by the group in some fashion and that individuals who perform both types of these behaviors are seen by others as indicative of leadership. However, as hypothesized, social-oriented behaviors were found to be relatively more important predictors of leader emergence than were task-oriented behaviors during Phase 1 of team development, and team members perceived task behavior to be relatively more important than social behavior to leader emergence during Phases 2 and 3. These results were expected and appear to support the notion that a team's needs change over the course of a project and that individuals who engage in behaviors appropriate to those changing needs are perceived as leaders.

More specifically, the pattern of results suggests that groups primarily had social needs to be fulfilled during the first half of the project, and that the members who could fill such needs were seen as leaders. However, as groups arrived at the midpoint of their projects and proceeded to the completion phase, they developed beyond the need for social interaction and became more concerned with task completion. They, therefore, needed task leadership to help the team make progress toward completing the project, and perceived members who engaged in those behaviors as leaders. Overall, the results support the combined model of group development described by Chang et al. (2003), who theorized that, during Phase 1, the group is concerned with structure and socialization, while, during Phases 2 and 3, the group is most concerned with completing the task.

After examining the results, some interesting patterns emerged. For example, while not hypothesized, we expected the relationship between team member behaviors and emergent leadership to be relatively static during the three phases of group development. However, examining the pseudo  $\Delta R^2$  values at the different phases revealed that these behaviors (i.e., social, task, and talkativeness) collectively had a stronger impact on leadership emergence during the last phase than during the first

phase. This would seem to suggest that as a team's demands become more intense and the team experiences its final burst of activity before the deadline, these behaviors become more salient predictors of emergent leadership. This seemingly lends credibility to the importance of focusing on the relationship between individual behaviors and emergent leadership, as team member behavior can be modified to match what a SMWT needs at different points during a project, specifically during their busiest time of activity.

Additionally, while we hypothesized that task-oriented leadership behavior would become more important as the team progressed through the three phases of group development, we did not expect there to be a slight resurgence in the need for social-oriented behaviors in Phase 3. That is, we expected that during Phase 1 social-oriented behaviors would predict emergent leadership as the group would be more focused on social development than task competition and that the relationship between social-oriented behaviors and emergent leadership would weaken during Phase 2 as the team started to recognize the urgency of completing the task and started thinking about ways to accomplish the goal. The results seem to support this notion as the relative importance and dominance weights for social-oriented behaviors were half of what they were in Phase 2 as in Phase 1. We then expected this trend to continue and the relationship between social-oriented behaviors and emergent leadership would weaken, or at least remain static, from Phase 2 to 3. However, social-oriented behaviors contributed more to the prediction of emergent leadership in Phase 3 than Phase 2, as evidenced by the increased relative importance and general dominance weights. This overall pattern of results seems to suggest that while the team is focused on task completion ahead of the looming deadline in Phase 3, the social needs of the team should also continue to be addressed during what is likely a chaotic and relatively stressful time.

Another unexpected finding was the significant role that the control variable, talkativeness, played in predicting leader emergence. Across all three phases of group development, perceived talkativeness was significantly related to perceptions of leader emergence. By itself, this finding is not altogether surprising. The relationship between quantity of participation and leader emergence is well documented (see, for example, Jones & Kelly, 2007, and Mullen et al., 1989, for reviews of this literature). Likewise, extraversion, of which talkativeness is a key component (Grant, Gino, & Hofmann, 2011), has been extensively studied as a primary predictor of leader emergence (see meta-analyses by Judge et al., 2002, and Ensari, Riggio, Christian, & Carslaw, 2011). However, the finding that talkativeness rivaled both task and social behavior as a predictor of leader emergence was more interesting. Talkativeness was similar to both social and task behavior in terms of relative importance during Phase 1 of group development. During Phases 2 and 3, talkativeness was relatively more important than social behavior and similar in importance to task behavior in predicting leader emergence by Phase 3. These results suggest that simply engaging in the group's conversation is related to emergent leadership during all phases of group development.

Finally, the results of post-hoc exploratory analyses revealed a significant interaction between task-oriented behavior and talkativeness during Phases 2 and 3. These interactions were in a direction that was perhaps not as immediately intuitive. For both phases, task behavior and emergent leadership were more strongly positively related when talkativeness was low rather than high. Although prior research has demonstrated that task-related activities are related to leader emergence (e.g., Couch & Carter, 1952; Taggar et al., 1999; Walter, Cole, van der Vegt, Rubin, & Bommer, 2012), one explanation for the interaction with talkativeness might be that, unlike social behaviors, task-oriented behaviors (e.g., facilitating goal accomplishment, monitoring work) require less verbal interaction. In fact, since Phases 2 and 3 of group development involve a shift toward task accomplishment and dedication to task-related activity, unnecessary verbal discussion might be viewed as interfering with, or at least distracting from, actual task-related behavior.

A recent series of experiments by Jones and Kelly (2011) may provide some explanation for the findings in the current study. They found that quantity and quality of verbal participation interacted to affect leadership ratings, such that quantity of participation influenced perceptions of leadership when the quality of the contribution was high, but not when quality was low. Thus, in the current study, perhaps when team members were very talkative, they were perceived as having less of an impact on the

team's goal accomplishment because the quality of their behavioral contribution to the task was perceived to be lower. Conversely, team members who were less talkative may have been perceived as having higher quality behavioral contributions to the team's goal accomplishment.

### **Limitations**

One potential limitation of the present study is that our participants were all university students; thus, these teams may not mirror the complexity of team membership in actual organizations. However, participants were assigned a project with a meaningful outcome, and were given instruction and were reminded of the project, but were not given direct assistance. They were, in effect, self-directed work teams. Therefore, this research may be generalizable to temporary work teams that are composed for the purpose of completing a specific task with a deadline, and then are disbanded.

A second concern for this study was the high intercorrelations among some of the study's variables, indicating that participants may not have clearly differentiated among the constructs. This may have been the result of common method variance, since all constructs were self-reported by participants via paper-pencil surveys, potentially inflating the correlations among the constructs (Doty & Glick, 1998).

### **Contributions and Practical Implications**

In their recent review of the state of research on team effectiveness, Mathieu, Maynard, Rapp, and Gilson (2008) noted that relatively few empirical studies have included time as a variable of interest; consequently, they called for more longitudinal team-related research. We believe that the current research, which investigated emergent leadership over the group development process, is one answer to this call. We have demonstrated that behaviors that are important for leader emergence change as the needs of the team change over time. Karriker (2005) proposed that the leader emergence process is an ongoing cyclical one that is repeated as internal or external team conditions change. Consequently, future research should continue to investigate emergent leadership longitudinally, across longer time frames, in order to examine the process further.

Additionally, future research on leadership emergence should begin to draw upon the growing shared leadership literature. Shared leadership, by definition, occurs when multiple team members engage in the leadership of a team (Carson, Tesluk, & Marrone, 2007; Gibb, 1954; Pearce, 2004). Most of the research on shared leadership implies an emergent shared leadership process (as opposed to an appointed one), by which multiple team members are involved in the leadership of the team. In fact, Pearce (2004) characterized shared leadership as the "serial emergence" of two or more members as leaders (p. 48). For example, the current study suggests that task and social behaviors are differentially important at different points in a group's development, but it is possible that multiple members are contributing each kind of behavior; consequently, there might be an emergent *shared* leadership process occurring over the group development process. Thus, we believe that future research in this area would benefit from explicitly integrating the shared leadership and emergent leadership literatures. This kind of integration could better address questions related to the effects of appointed shared leadership versus emergent shared leadership as well as to the nature of the emergent shared leadership process (i.e., serial emergence versus simultaneous emergence of multiple leaders).

In addition to contributing to the academic literature, the findings reported here also have implications for both student teams and self-directed work teams. Our results indicated that groups had a stronger need for social leadership at the beginning of a project and at its completion than it did during the middle phase of group development. Understanding that social interaction is an important and necessary part of team development can ease concerns of management and anxious team members. Social interaction may be necessary for facilitating task progress, and should not necessarily be dismissed as a waste of time.

There may also be implications for team training. Training on various types of leadership could help employees recognize behaviors that are likely to be needed by the group. This could empower employees with relevant skills to step up as leaders, who may not have otherwise done so. Proper

training could also prepare team members for transitions among leaders and for various group needs throughout the project.

## CONCLUSION

The results of this research suggest that the leadership needs of temporary project teams change over the course of the group's development. Additionally, although simply being a talkative member of a team might cause a person to be perceived as a leader initially, the content of one's verbal contributions matter once the team moves into later phases of a project, when talking might actually be perceived as distracting from task-oriented leadership. This research contributes to the group development research by highlighting the relationship between leadership emergence and the process of group development, which may prove to be important as companies continue to move toward project-based SMWTs. Understanding how a group gets work done and how projects are effectively led to completion is valuable information for organizational managers and team members.

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