The Contagious Leader: Impact of the Leader's Mood on the Mood of Group Members, Group Affective Tone, and Group Processes

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The present study examined the effects of leaders' mood on (a) the mood of individual group members, (b) the affective tone of groups, and (c) 3 group processes: coordination, effort expenditure, and task strategy. On the basis of a mood contagion model, the authors found that when leaders were in a positive mood, in comparison to a negative mood, (a) individual group members experienced more positive and less negative mood, and (b) groups had a more positive and a less negative affective tone. The authors also found that groups with leaders in a positive mood exhibited more coordination and expended less effort than did groups with leaders in a negative mood. Applied implications of the results are discussed.

Leaders frequently experience moods, but the consequences of leaders' moods on their subordinates are unclear (Brief & Weiss, 2002; Lewis, 2000). Understanding the effects of leaders' moods is critical because leaders' moods may influence the way subordinates feel, think, and act (George, 2000; Goleman, Boyatzis, & McKee, 2001). Groups may experience different feelings and exhibit different actions depending on the mood of the leader. As such, leaders' moods may ultimately impact the performance of their groups. The effects of leaders' moods on subordinates is an important issue that awaits further research. The focus of the present article is the effects of leaders' moods on (a) the moods of individual group members, (b) the affective tone of groups, and (c) group processes.

In the present article, we focus on the dimensions of positive and negative mood (Watson & Tellegen, 1985). Consistent with past theorizing, we define *moods* as generalized feeling states of relatively low intensity with no clear antecedent causes (Clark & Isen,

1982; Clore, Schwarz, & Conway, 1994; Weiss, 2002). Positive mood includes states such as enthusiastic, excited, and elated, and negative mood includes states such as hostile, nervous, and distressed (Watson, Clark, & Tellegen, 1988).

Leadership in Self-Managing Groups

Our focus in the present article is on *self-managing groups*. Self-managing groups are formally organized groups that are given responsibility and authority beyond that traditionally experienced by group members (Stewart & Manz, 1995). Self-managing groups are given high autonomy and control over their tasks (Hackman, 1986; Manz, 1992). More specifically, self-managing groups control their work methods, schedules, meetings, and task assignments and solve quality and interpersonal problems (Lawler, 1988; Manz & Sims, 1993). Current trends show that organizations are continually increasing employee involvement through self-managing groups (Lawler, 1998; Stewart & Manz, 1995; Walton, 1985). Organizations use self-managing groups to improve productivity, quality, cost savings, and employee morale and to decrease absenteeism and turnover (Stewart & Manz, 1995).

Although all members share responsibility in self-managing groups, some form of leadership is always present in these groups. *Leadership in self-managing groups* refers to "guidance and direction provided to a team by someone functioning in a role constituting formal authority to influence the team" (Stewart & Manz, 1995, p. 751). Theorists have argued that leadership is necessary for self-managing groups to perform at high levels (Klein, 1984; Letize & Donovan, 1990; Manz & Sims, 1987). In fact, some self-managing groups are unwilling to function without some form of leadership (Barker, 1993). In self-managing groups, the roles that members assume are flexible and dynamic (Seers, 1989). As such, any member of a self-managing group can be called upon to provide leadership on a specific task. Typically, the person with the most appropriate knowledge, skills, abilities, and traits for a specific task provides leadership on that task (Pescosolido, 2002).

In the present research, we extend previous explorations of leadership in self-managing groups by testing whether the mood of the leader on a given task influences the mood of the subordinates, the affective tone of the group, and group processes during the completion of that task. Given that leaders of self-managing groups are in less formal positions than are leaders of other groups, self-managing groups provide a conservative test of the effects of the mood of the leader. That is, the effects of the mood of the leader are expected to be stronger in groups in which leaders are permanent and formally at a high hierarchical level. Therefore, it seems reasonable to believe that effects that occur in self-managing groups would also occur in groups in which leadership is more permanent and formal.

Influence of the Leader's Moods on the Moods of Individual Group Members

We posit that leaders' moods influence other group members because leaders' public expressions of moods influence the affect, cognition, and behavior of other group members. Research indicates that experienced affective states manifest themselves through facial, vocal, and postural cues (Cacioppo, Petty, Losch, & Kim, 1986; Matsumoto, 1987). Individuals have innate abilities to express their affective states and to ascertain the affective states of others (for a review, see Bartel & Saavedra, 2000). Cross-cultural research indicates that people can accurately identify the affective displays of others (Ekman, 2003). Accordingly, facial, vocal, and postural cues serve as reliable and readily available information about others' moods, and leaders in positive and negative moods vary in their facial, vocal, and postural expressions.

We further argue that leaders transmit their moods to other group members through mood contagion. Mood contagion is a mechanism that induces a congruent mood state through the observation of another person's public display of mood (Neumann & Strack, 2000). Researchers have described mood contagion and the related process of emotional contagion as a two-stage process (Barsade, 2002; Hatfield, Cacioppo, & Rapson, 1994; Neumann & Strack, 2000). In the first stage, individuals unintentionally mimic the public displays of mood of others. Evidence exists for this chameleon effect. For example, Chartrand and Bargh (1999) showed that participants in a social interaction subconsciously mimic the smiling activity of their partners. In the second stage of the mood contagion process, afferent feedback from facial, postural, or vocal mimicry produces a corresponding mood response (Duclos et al., 1989; Strack, Martin, & Stepper, 1988). In other words, mimicking facial, vocal, or postural behaviors leads one to experience the moods that are associated with those behaviors. For example, smiling elicits positive mood.

Evidence of mood contagion (and emotional contagion) is found in a wide range of individuals in natural and experimental settings (see Hatfield et al., 1994; Kelly & Barsade, 2001, for reviews). Examples include Lebon's (1896) study of group minds and the dancing manias of the Middle Ages (Hecker, 1970). Recent studies have shown that people catch others' affect in organizations (Barsade, 2002; Bartel & Saavedra, 2000; Totterdell, 2000; Totterdell, Kellett, Teuchmann, & Briner, 1998). Even so, past studies did not directly pertain to leadership. We directly examined mood contagion from leaders to subordinates in the present study.

Hatfield et al. (1994) proposed that individuals are most likely to transmit their moods when they are able to express their mood to others. Further, individuals are most likely to catch others' moods when they attend to others' moods and are able to read others' moods. These propositions suggest that leaders are more likely to be transmitters of moods and subordinates are more likely to be receivers of moods. Leaders should have more opportunities to express and transmit their moods because they influence and control groups' time, resources, and interactions. Furthermore, subordinates are more likely to attend to leaders' moods because they depend more on the leader than vice versa. Thus, leaders and subordinates possess the attributes necessary to be transmitters and receivers of moods, respectively. Supporting this argument is evidence that subordinates readily ascertain leaders' affective displays (Lewis, 2000) and that lower status individuals more often catch the moods of higher status individuals than vice versa (Anderson, Keltner, & John, 2003). We therefore hypothesized the following:

> *Hypothesis 1:* Group members with leaders in a positive mood experience more positive mood than do group members with leaders in a negative mood.

> *Hypothesis 2:* Group members with leaders in a negative mood experience more negative mood than do group members with leaders in a positive mood.

Influence of the Leader's Moods on Group Affective Tone

Group affective tone consists of "consistent or homogenous affective reactions within a group" (George, 1990, p. 108). Group affective tone is an aggregate of the moods of the individual members of the group and refers to mood at the group level of analysis. If the moods of the individual group members are consistent, then group affective tone can be treated as a group property (George, 1990). Not all groups possess an affective tone; members of some groups do not experience similar moods. Even so, past research indicates that a majority of groups possess an affective tone (see George, 1996, for a review). Group members tend to experience similar moods based on several theoretical mechanisms, including the selection and composition of group members, the socialization of group members, and exposure of group members to the same affective events, such as task demands and outcomes (George, 1996; Weiss & Cropanzano, 1996). Also, moods tend to be shared among group members through processes such as mood contagion (Neumann & Strack, 2000) and impression management (Kelly & Barsade, 2001). Group affective tone is associated with various organizational outcomes such as group prosocial behavior (see George, 1996; Kelly & Barsade, 2001, for reviews). We propose that leaders influence group affective tone through mood contagion in the same way that leaders influence the moods of individual group members. Thus, we hypothesized the following:

> *Hypothesis 3:* Groups with leaders in a positive mood have a more positive affective tone than do groups with leaders in a negative mood.

Hypothesis 4: Groups with leaders in a negative mood have a more negative affective tone than do groups with leaders in a positive mood.

Influence of the Leader's Moods on Group Processes

Leaders' moods might also influence group processes. The focus of the present research was on three group processes that contribute to performance and effectiveness (Hackman, 1987): coordination, effort expenditure, and task strategy. *Coordination* refers to group member synergistic interactions that avoid slippage and wasted effort. *Effort* is the collective level of energy exerted by group members toward completion of the task. *Task strategy* represents the development of an approach to the work that is fully appropriate for the task being performed.

Our predictions of the effects of leaders' moods on group processes are based on the presumption that public expressions of mood impact how group members think and act. According to social functional accounts of affect (Frijda & Mesquita, 1994; Keltner & Haidt, 1999; Plutchik, 1980), the affective system evolved in part to signal one's goals, intentions, and attitudes to other persons. When people experience and express mood, they send signals to others. For example, subordinates make inferences about leaders' abilities based on the leaders' public displays of affect (Lewis, 2000). We posit that leaders signal their goals, intentions, and attitudes through their expressions of moods and that group members respond to those signals cognitively and behaviorally in ways that are reflected in the coordination, effort expenditure, and task strategy of the group.

Research has demonstrated that moods influence how people think and act, presumably by providing information that guides judgment and information processing (see Brief & Weiss, 2002; Clore et al., 1994; Loewenstein & Lerner, 2003, for reviews). Research has also shown that the influences of moods depend on the context. In particular, the mood-as-input model (Martin, Ward, Achee, & Wyer, 1993) posits that people take into account the context when interpreting the information provided by their moods. A given mood may signal one thing in one context and another thing in a different context. Researchers of the mood-as-input model have distinguished between contexts that emphasize performance and contexts that emphasize enjoyment (Hirt, Melton, McDonald, & Harackiewicz, 1996; Martin et al., 1993). In the present study, we focused on a task with a clear performance objective, that is, to correctly build a tent. In contexts that emphasize performance, negative moods indicate that progress toward the attainment of goals is insufficient, and positive moods indicate that progress toward the attainment of goals is good (Martin et al., 1993). As a consequence, individuals process information more systematically in contexts that emphasize performance when they are in a negative mood than when they are in a positive mood (Hirt et al., 1996; Martin et al., 1993). Our predictions concerning the effects of leaders' moods on group effort expenditure, coordination, and task strategy were based on past theory and research indicating that in contexts that emphasize performance, negative moods are signals that people have not attained or made adequate progress toward goals, and positive moods are signals that people have attained or made adequate progress toward goals (Martin et al., 1993).

Leader Mood and Effort Expenditure

Within the mood-as-input framework, group members interpret leaders' expression of negative moods as signals that leaders deem progress on the task to be inadequate. Subordinates who perceive these signals should as a consequence increase their effort toward the completion of the task. This reasoning is consistent with previous findings. For example, individuals read more information about a person before making a judgment about that person when in a negative mood than when in a positive mood in a context that emphasizes the quality of the judgment (i.e., a performance context; Martin et al., 1993). Also, workers exhibit more creativity when they tend to experience negative moods in contexts that reward creative performance than when they tend to experience positive moods in the same contexts, to the extent that workers' moods are clear (George & Zhou, 2002). We therefore proposed that groups expend more effort in response to leaders' expressions of negative moods than they do in response to positive moods:

> *Hypothesis 5:* The mood of the leader influences group effort, such that groups with leaders in a negative mood expend more effort than do groups with leaders in a positive mood.

Leader Mood and Coordination

In a performance context, expressions of positive moods by leaders signal that leaders deem progress toward goals to be good. We contend that as a result, leaders in a positive mood convey a sense of security to group members that, in turn, invites group members to engage in agreeable and friendly behavior. These behaviors contribute to high coordination among group members. Consistent with this reasoning, Barsade (2002) found that groups with high positive affect exhibit more cooperation and less conflict than do groups with high negative affect. Also, George and Bettenhausen (1990) showed that groups with leaders in a positive mood exhibit more prosocial behaviors than do groups with leaders in a negative mood. We hypothesized the following:

> *Hypothesis 6:* The mood of the leader influences group coordination, such that groups with leaders in a positive mood exhibit better coordination than do groups with leaders in a negative mood.

Leader Mood and Task Strategy

We argued above that in a performance context, group members interpret leaders' expressions of negative moods as signals that leaders are not satisfied with the progress on the task and that, as a result, subordinates increase their effort toward the completion of the task. We also argued that leaders' displays of positive moods signal that progress on the task is good and that, as a result, subordinates expend relatively little effort toward the completion of the task. We extended these arguments to generate hypotheses concerning the development of a strategy for a task. With a leader in a negative mood, the group may feel the urgency to develop an optimal strategy as a result of receiving a signal that progress is inadequate. With a leader in a positive mood, however, the group may feel little need to develop a strategy, as the group believes that it is already making adequate progress. We hypothesized, based on the preceding arguments, that groups with a leader in a negative

mood will exhibit a better strategy than will groups with a leader in a positive mood:

> *Hypothesis 7:* The mood of the leader influences group task strategy, such that groups with leaders in a negative mood adopt a better strategy than do groups with leaders in a positive mood.

Method

We used an experimental design to manipulate the mood of the leader. An experimental design permitted us to make causal statements concerning the effects of the mood of the leader and provided experimental control of factors that could impact our outcomes of interest. We also analyzed real intact groups with existing norms and histories to enhance the external validity of our results.

Participants

One hundred eighty-nine students (107 women and 82 men) forming 56 intact groups were recruited from three undergraduate courses in organizational behavior at two large universities in the Midwest and West regions of the United States. As part of a class requirement, students formed groups to complete a project. There were 36 three-member groups, 19 four-member groups, and 1 five-member group. The average age of the participants was 22 years. At the time of the study, groups were spending approximately 2 hr/week together and had been together for 2.5 months. Groups conducted meetings, outlined task procedures, assigned tasks to members, and handled interpersonal issues. Therefore, the groups fit the definition of self-managing groups. Groups, with their respective members, were randomly assigned to one of two leader mood conditions: positive leader mood and negative leader mood.

Procedure

Groups participated in a 1-hr experiment conducted by experimenters and observers who were undergraduate research assistants. Both experimenters and observers were unaware of the hypotheses and goals of the present study. Participants were led to believe that the study concerned group interaction effects on memory recall and that as a result they would (a) memorize information, (b) interact with group members, and (c) take a memory test. After a brief introduction, participants signed a consent form to indicate that they agreed to take part in the study and completed a mood scale to measure their baseline mood (Time 1 [T1] baseline mood of leaders and subordinates). Participants were told that they would rate their mood throughout the exercise. To alleviate suspicion, we told participants that the experimenters needed to control for differences in how people felt because past studies found that feelings influence the ability to recall information.

As stated previously, any member of a self-managing group can provide leadership on a specific task. The person with the most appropriate knowledge, skills, abilities, and traits for a specific task typically leads the other group members on that task. As described below, in the present study we provided unique knowledge and influence to the leader by giving the leader some instructions that were necessary to complete the task. As such, we randomly selected leaders among each group.

Leaders were separated from the rest of the group and told that their group members would perform the task of erecting a tent while blindfolded (see Quinn, 2000). Pilot studies revealed that the blindfolded tent exercise provides an accurate picture of group dynamics. The blindfold tends to alleviate the effects that observers have on participants. Blindfolded participants are less self-conscious and behave candidly and naturally. For these reasons, the blindfolded tent exercise is ideal for studying interpersonal interactions and moods in groups. The tent building exercise is often used in undergraduate and master's level psychology and business courses to illustrate concepts of group dynamics and, more specifically, how mood influences group dynamics. Consultants and corporate leaders also use the tent exercise to improve group dynamics.

Leaders were given a pamphlet with instructions and pictures on how to assemble the tent. The information contained in the pamphlet was necessary to assemble the tent quickly and effectively. The pamphlet, however, did not provide complete step-by-step procedures. As a result, groups could exhibit varying strategies to build the tent by varying the procedures and the sequences of actions. For example, some group leaders assigned roles and tasks to each member of the group, whereas other group leaders did not assign roles and tasks. Leaders were asked to study the pamphlet for 5 min because they would lead their group in erecting the tent. Other group members did not have the opportunity to see the pamphlet. At the conclusion of the 5 min, leaders' knowledge of the task was tested with a questionnaire on the tent-building procedures. If leaders answered any of the test items incorrectly, the experimenter clarified this aspect of the tent building procedure. The questionnaire ensured that all leaders had the same knowledge base to perform the task and that differences in knowledge would not cause differences in group processes.

After the tent knowledge test, leaders were told that they had been chosen to memorize visual information while their teammates memorized verbal information. Leaders were told that they would be shown a segment of a random videotape and that they were to pay close attention because their recall of information about the videotape would be tested after the tent exercise. In actuality, the videotape was the mood manipulation. Mood was manipulated by showing one of two film clips. Leaders in the positive mood condition viewed a humorous clip of David Letterman, a funny late-night TV variety show host. Participants in the negative mood condition viewed part of a TV documentary about social injustice and aggression. Both clips lasted about 8 min. Clips of this duration have been used in past research to successfully elicit positive and negative mood (e.g., Saavedra & Earley, 1991).

After leaders viewed the videotape, leaders filled out a mood scale (T2 pretask mood of leaders). This measure consisted of the manipulation check for the mood induction in leaders. After completing the mood scale, leaders rejoined the rest of their group. While the leaders watched the videotape, the other group members were kept busy with the bogus task of memorizing a list of words.

Prior to the tent task, groups and their leaders were given 7 min to interact and plan for the task. The transference of mood from leaders to group members was expected to occur during this 7-min interaction. At the end of the 7 min, group members were given the pretask mood scale to fill out (T2 pretask mood of subordinates). Although it was not necessary, we asked leaders to fill out the mood scale, to avoid raising suspicion. The T2 pretask mood measure of subordinate mood was used in analyses of the influence of leaders' moods on the moods of subordinates and the affective tone of groups. Immediately after the planning stage, group members engaged in the task of erecting a tent while blindfolded. Groups were given 15 min to complete the task.

Group processes were coded in vivo as groups worked on the task. Observers coded the group processes to avoid the potential problems of common method variance and self-report biases. Pilot studies indicated that coding the task in vivo was necessary because other methods such as videotape coding did not accurately capture the movements and behaviors of all group members. One experimenter and two observers were assigned for each group. Experimenters' responsibilities were to conduct and manage the experimental process, but experimenters did not evaluate group processes. Only the observers, who were blind to the experimental conditions of the groups, evaluated group processes.

Twelve observers participated in 31 hr of training. Training lasted for 5 weeks, with approximately 6 hr of training per week. Prior to Week 1, observers were given the observation form to study, and they memorized the criteria for the three group processes. The observation form and criteria

were adopted from Hackman's (1982) study and correspond with the normative model of group effectiveness that posits that coordination, effort, and strategy are crucial factors influencing group effectiveness (Hackman, 1987). As each of the three group process variables had several criteria, we expected that it would be easier for observers to evaluate these criteria if observers committed them to memory. The first 2 weeks of training consisted of evaluating coordination, effort expenditure, and task strategy on videotapes that contained scenes of groups building a tent while blindfolded. The videotapes were created previously for a different study. Observers met twice a week for 3 hr per meeting. For every hour of training, observers watched a random 15-min scene. While watching the scene, observers took notes on group processes using a standardized form designed to increase evaluation accuracy. The standardized form consisted of a header listing all items used to measure group processes (described below) and a box area for recording behaviors. Observers were trained to identify key behaviors that illustrate each group process and record notes on the standardized form. The notes proved useful in evaluating the group processes accurately because the notes facilitated focus and could be referred to for the final evaluation. At the first meeting (Week 1), observers also participated in the tent-building task while blindfolded to familiarize themselves with the task that they would be evaluating and to increase accuracy. The criteria for each of the group process variables were then reviewed, and questions regarding the criteria were discussed and resolved. Observers were also given a test to check their knowledge of the criteria. Observers were told that they should evaluate the group on observable behaviors only (e.g., physical behaviors, speech content, voice tone, and pitch) and not on their perceptions of the group's intentions. Furthermore, observers were explicitly told to evaluate the group as a whole and to not focus on specific individuals, as we were interested in group-level processes.

Observers recorded actions that exemplified group processes. For example, if a group member was lying on the floor and did not participate with the group, observers recorded this behavior in the effort section of the standardized form. At the conclusion of the 15 min, observers independently evaluated group processes using their own notes (independent observation scores). After the independent evaluations, observers compared scores, discussed the rationale for their scores, and agreed upon a score for each item for each group process (agreement scores). The 2nd week of training was identical to the 1st week. The last 3 weeks consisted of similar training except observers evaluated live groups instead of videotaped groups. Trial runs of the actual study were then conducted. Observers continued to meet twice a week for 3 hr per training session. At each meeting, two trial runs were conducted. As we describe below, the training led to high interrater reliability in the assessment of group processes.

In the study, once groups finished the tent-building task or time ran out, all participants completed the posttask mood scale (T3 posttask mood of leaders and subordinates). Only the mood of subordinates was of interest to test the mood contagion hypotheses, but all participants completed the posttask mood scale to alleviate suspicion. All participants were then given a bogus memory test to follow through on the study rationale of testing the effects of group interaction on memory recall. Leaders were asked to recall information from the videotape, including images, language, people, place, facts, and dates. Subordinates were asked to recall as many words as possible from the list that they had learned earlier. Participants were subsequently debriefed. Questions were answered and participants were thanked for their contribution.

Measures

Mood of individual group members. To measure positive and negative mood immediately after the planning stage (T2 pretask mood) and after task completion (T3 posttask mood), we used the Job Affect Scale (Brief, Burke, George, Robinson, & Webster, 1988; Burke, Brief, George, Roberson, & Webster, 1989), a 20-item self-report scale. The positive mood

scale includes 6 high positive mood items (active, strong, excited, enthusiastic, peppy, and elated) and 4 reverse-scored low positive mood items (sleepy, dull, drowsy, and sluggish). The negative mood scale includes 6 high negative mood items (distressed, scornful, hostile, fearful, nervous, and jittery) and 4 reverse-scored low negative mood items (calm, relaxed, at rest, and placid). The Job Affect Scale has been used in past research on mood in group and organizational contexts (Brief & Roberson, 1989; Saavedra & Earley, 1991; Saavedra & Kwun, 2000).

Group affective tone. We calculated positive and negative group affective tone at two time points: immediately after the planning stage (T2 pretask group affective tone) and after task completion (T3 posttask group affective tone). To calculate positive group affective tone (negative group affective tone), we first calculated the positive (negative) composite at the individual level, as described in the previous paragraph. We then determined the degree of within-group similarity, as described in the results section. Within-group similarity was high, so we averaged the positive (negative) composites for subordinates in each group. We excluded leaders because we were interested in the contagion of mood from leaders to subordinates.

Group processes. Observers rated group effort, coordination, and task strategy using a priori 5-point scales developed by Hackman (1982). Observers rated effort expenditure with two items (e.g., "How much effort does the group bring to bear on the group task relative to what is required for acceptable performance?"). Anchors for both items were specific to that question. For example, the anchors for the above question concerning effort were (1) *insufficient effort is applied*, (3) *marginally sufficient effort is applied*, and (5) *fully adequate effort is applied*. Behaviors that observers considered in their assessment included the intensity and speed of behavior and the percentage of group members participating in the activity.

Observers rated coordination with three items (e.g., "How well are group members' efforts coordinated?"). Anchors for each item were specific to that question. For example, the anchors for the above item concerning group coordination were (1) *poorly; there is a lot of slippage and wasted effort*, (3) *moderately well*, and (5) *very well; virtually no effort is lost or wasted due to faulty coordination*. Behaviors that observers considered in their assessment included the number of group members coordinating their actions (instead of working alone), the amount of coordinated behaviors, and the amount and the quality of communication exchanges.

Observers rated task strategy with four items (e.g., "How skilled was the group at developing an appropriate work plan for the group task?"). Again, anchors for each item were specific to that question. For example, the anchors for the above item concerning task strategy were (1) *incompetent*, (3) *moderately competent*, and (5) *highly skilled*. Behaviors that observers considered in their assessment included the number of strategies considered, the diversity of different strategic approaches, the amount of time spent on developing a strategy, and the follow-through on the selected strategy.

We first assessed interrater reliability for all items for each group process variable using r_{wg} (James, Demaree, & Wolf, 1984). All interrater reliability assessments were conducted using observers' independent observation scores. Inspection of Table 1 indicates that interrater reliability was high for all items. Rather than averaging observers' independent observation scores to derive a score for each item for each group process variable, we had observers discuss and agree on a score for each item for each group process variable. More specifically, when there was disagreement, observers (a) revealed their independent observation scores, (b) debated and discussed evidence to support their ratings and (c) reached agreement on a final score. For example, if two observers provided ratings of 3 and 4 for the same item for the same group process variable, the observers debated the rationale for their rating and agreed upon a final score (e.g., both agreeing to select 3 or 4, or deciding to average the two). Agreement scores provided the most accurate evaluation of group processes because observers had the opportunity to consider other observers' rationale and evidence. We subsequently assessed internal consistency

Table 1

Descriptive Statistics and Measures of Interrater Reliability for Group Process Items

Group process item	Min.	Max.	*Mdn*	*M*	*SD*	r_{wg}
1. Group coordination Item 1	1	5	3	3.27	1.09	.95
2. Group coordination Item 2	2	5	4	3.54	0.83	.96
3. Group coordination Item 3	1	5	4	3.57	1.20	.96
4. Group effort Item 1	1	5	4	3.66	0.98	.95
5. Group effort Item 2	1	5	3	3.21	1.07	.97
6. Group strategy Item 1	1	5	3	3.27	1.12	.94
7. Group strategy Item 2	1	5	3	2.75	1.15	.90
8. Group strategy Item 3	1	5	3	3.13	1.08	.87
9. Group strategy Item 4	1	5	3	3.32	1.16	.86

Note. $N = 189$. Min. = minimum; Max. = maximum.

among the scale items for the same group process variable using Cronbach's alpha. Internal consistency was high (shown later in Table 2), and thus we averaged across items to create one score for each group process variable for each group.

Group performance. For exploratory purposes, we gathered information about performance. Once the allotted time expired, observers recorded how much of the task was completed. Groups were given a rating of 1 if they "located all items of the tent," 2 if they "laid the tent out," 3 if they "attached one pole to the tent," 4 if they "attached two poles to the tent," 5 if they "attached three poles to the tent," 6 if they "attached four poles to the tent," and 7 if they "had the tent erected and complete." As the observations were very unambiguous, observers had no disagreement of performance.

Results

Tables 2 and 3 display descriptive statistics and intercorrelations among the variables at the group and the individual levels of analysis, respectively.

Manipulation Check

We explored whether leaders in the positive mood condition experienced different moods prior to the group task and after watching the movies (T2) than did leaders in the negative mood condition. A *t* test revealed that leaders in the positive mood condition reported being in a more positive mood ($M = 4.45$, $SD = 0.72$) than did leaders in the negative mood condition ($M =$ 2.94, $SD = 0.54$), $t(54) = 8.78$, $p < .001$. Also, leaders in the negative mood condition reported being in a more negative mood ($M = 3.75$, $SD = 0.73$) than did leaders in the positive mood condition ($M = 2.48$, $SD = 0.54$), $t(54) = -7.46$, $p < .001$. As expected, leaders' moods varied based on random assignment to a condition prior to the task. To further check the manipulation, we verified that the moods of leaders changed positively or negatively after the leaders saw the video, depending on their experimental condition. As expected, leaders in the positive mood condition were in a more positive mood after ($M = 4.45$, $SD = 0.72$) than before they saw the video ($M = 3.18$, $SD = 0.67$), $t(28) = -7.44$, $p < .001$. Also, leaders in the negative mood condition were in a more negative mood after ($M = 3.75$, $SD = 0.73$) than before they saw the video ($M = 2.85$, $SD = 0.74$), $t(26) = -8.18$, $p < .001$.

Effects of the Leader's Mood on the Mood of Individual Group Members

Prior to exploring the effects of leaders' moods, we examined whether participants' moods upon arrival to the experiment (T1 baseline mood) were different. A *t* test revealed that the baseline moods of the participants in the two experimental conditions were not significantly different. Participants in the positive mood condition ($M = 3.15$, $SD = 0.61$) did not differ from participants in the negative mood condition ($M = 3.12$, $SD = 0.60$), $t(187) = 0.41$, $p > .05$, in their positive mood. Participants in the positive mood condition ($M = 2.75$, $SD = 0.48$) also did not differ from participants in the negative mood condition ($M = 2.74$, $SD = 0.64$), $t(187) = 0.03$, $p > .05$, in their negative mood.

We predicted in Hypothesis 1 that group members with a leader in a positive mood would be in a more positive mood after interacting with that leader than would group members with a leader in a negative mood. We also predicted in Hypothesis 2 that group members with a leader in a negative mood would be in a more negative mood after interacting with that leader than would group members with a leader in a positive mood. We conducted two hierarchical linear models (HLMs) to test these two predictions. An HLM analyzes data at multiple levels of analysis (Bryk & Raudenbush, 1992; Kenny, Kashy, & Bolger, 1998; Singer, 1998). It was necessary to use HLMs to examine the impact of the mood of the group leader on the mood of individual group members because individuals were nested within groups. The strategy involved expressing the individual-level outcome $mood_{ij}$ (the

Table 2

Descriptive Statistics and Correlations Between Variables at the Group Level

Variable	Min.	Max.	*M*	*SD*	1	2	3	4	5	6	7	8
1. Leader mood manipulation	1.00	2.00	1.48	0.50	—							
2. T2 Pretask positive group affective tone	2.35	5.00	3.68	0.66	−.65***	(.89)						
3. T2 Pretask negative group affective tone	1.60	5.20	3.04	0.63	.61***	−.59***	(.85)					
4. T3 Posttask positive group affective tone	2.77	5.03	3.83	0.54	−.67***	.72***	−.50***	(.79)				
5. T3 Posttask negative group affective tone	1.93	4.82	2.95	0.74	.48***	−.48***	.71***	−.57***	(.87)			
6. Group effort	1.00	5.00	3.44	0.96	.49***	−.27*	.21	−.35*	.24	(.83)		
7. Group coordination	1.33	5.00	3.46	0.91	−.46***	.44**	−.43**	.58***	−.49***	.13	(.85)	
8. Group task strategy	1.25	4.75	3.12	0.89	−.05	.12	−.14	.21	−.08	.41**	.59***	(.81)

Note. $n = 56$. Leader Mood Manipulation was coded as 1 = positive, 2 = negative. Internal consistency reliabilities are in parentheses along the diagonal. Min. = minimum; Max. = maximum; T = time.
* $p < .05$.   ** $p < .01$.   *** $p < .001$.

Table 3
Descriptive Statistics and Correlations Between Variables at the Individual Level

Variable	N	M	SD	1	2	3	4	5	6	7	8
1. Gender	189	1.56	0.50	—							
2. Age	189	21.66	2.26	−.21**	—						
3. Status	189	1.70	0.46	.06	.01	—					
4. Leader mood manipulation	189	1.50	0.50	−.08	.05	.03	—				
5. Group member T2 Pretask positive mood	186	3.65	0.86	−.10	.01	−.05	−.48***	(.87)			
6. Group member T2 Pretask negative mood	187	3.07	0.77	−.02	.10	−.02	.47***	−.41***	(.81)		
7. Group member T3 Posttask positive mood	189	3.83	0.68	−.11	.04	−.10	−.52***	.58***	−.36***	(.74)	
8. Group member T3 Posttask negative mood	188	2.95	0.84	−.04	.14	−.05	.41***	−.36***	.60***	−.39***	(.82)

Note. Gender was coded as 1 = male, 2 = female. Status was coded as 1 = leader, 2 = nonleader. Leader mood manipulation was coded as 1 = positive, 2 = negative. Internal consistency reliabilities are in parentheses along the diagonal. T = time.
** $p < .01$.   *** $p < .001$.

mood of the *i*th individual in the *j*th group) using a pair of linked models: one at the level of the individual and one at the level of the group (see Singer, 1998). In the individual level model, the mood of the *i*th individual in the *j*th group was expressed as the sum of an intercept for the individual's group (β_{0j}) and random error (r_{ij}) associated with the *i*th individual in the *j*th group. In the group-level model, individual-level intercepts were expressed as the sum of an overall mean (γ_{00}), a fixed effect for leader mood (γ_{01} LEADER$_j$, where LEADER$_j$ is positive or negative), and a series of random deviations (u_{0j}). Substituting the group-level model into the individual-level model yields the multilevel model: mood$_{ij}$ = $\gamma_{00} + \gamma_{01}$ LEADER$_j$ + u_{0j} + r_{ij}.

This multilevel model tests whether the mood of the *i*th individual in the *j*th group can be predicted from the mood of that individual's group leader. The individual-level equation acknowledges that each group has its own typical level of mood (an intercept), around which individual group members fluctuate (within-group error terms). The group-level equation estimates group differences as a function of each group leader's mood (plus a between-groups error term). We performed analyses with mood measures obtained after the 7-min planning stage and immediately before task commencement (T2) and also with the mood measures obtained after task completion (T3). As predicted in Hypothesis 1, group members with a leader in a positive mood were in a more positive mood at T2 than were group members with a leader in a negative mood, $\gamma_{01} = -.55$, $F(1, 54) = 14.36$, $p < .001$. The positive mood of group members with a leader in a negative mood was on average .55 lower than the positive mood of group members with a leader in a positive mood, taking into account the group-level variability in positive mood. In addition, as predicted by Hypothesis 2, group members with a leader in a negative mood were in a more negative mood at T2 than were group members with a leader in a positive mood, $\gamma_{01} = .45$, $F(1, 54) = 7.91$, $p < .01$. The negative mood of group members with a leader in a negative mood was on average .45 higher than the negative mood of group members with a leader in a positive mood, taking into account the group-level variability in negative mood. The results were similar with T3 measures. Group members with a leader in a positive mood were in a more positive mood at T3 than were group members with a leader in a negative mood, $\gamma_{01} = -.64$, $F(1, 54) = 28.55$, $p < .001$. In addition, group members with a leader in a negative mood were in a more negative mood at T3 than were

group members with a leader in a positive mood, $\gamma_{01} = .60$, $F(1, 54) = 10.83$, $p < .01$.

Effects of the Leader's Mood on Group Affective Tone

We first determined whether there was sufficient similarity in the moods of group members to justify aggregation. The r_{wg} coefficient assesses the degree of agreement among group members by testing the proportion of systematic variance in group member ratings in comparison to the total variance (George & James, 1993; James et al., 1984). The average r_{wg} indexes were .84 and .91 for positive mood at T2 and T3, respectively, and .89 and .92 for negative mood at T2 and T3, respectively, indicating high within-group similarity. More specifically, of the 112 total estimates (56 for positive mood and 56 for negative mood) at T2, (a) 100 were equal to or greater than .70, (b) 93 were equal to or greater than .80, and (c) 65 were equal to or greater than .90. Of the 112 total estimates at T3, (a) 110 were equal to or greater than .70, (b) 106 were equal to or greater than .80, and (c) 82 were equal to or greater than .90. These analyses suggest that there was substantial clustering of mood within groups. It was thus appropriate to perform analyses of group affective tone.

We predicted in Hypotheses 3 and 4 that groups with a leader in a positive mood would have a more positive affective tone and a less negative affective tone, respectively, than would groups with a leader in a negative mood. These predictions were supported with mood measures obtained after the 7-min planning stage and before task commencement (T2). Groups with a leader in a positive mood had a more positive affective tone ($M = 4.09$, $SD = 0.59$) than did groups with a leader in a negative mood ($M = 3.25$, $SD = 0.40$), $t(54) = 6.21$, $p < .001$. Also, groups with a leader in a negative mood had a more negative affective tone ($M = 3.44$, $SD = 0.60$) than did groups with a leader in a positive mood ($M = 2.67$, $SD = 0.40$), $t(54) = -5.66$, $p < .001$. We also tested whether groups with a leader in a positive mood differed from groups with a leader in a negative mood after the task was completed (T3). These analyses again supported Hypotheses 3 and 4. Groups with a leader in a positive mood had a more positive affective tone ($M = 4.17$, $SD = 0.47$) than did groups with a leader in a negative mood ($M = 3.46$, $SD = 0.32$), $t(54) = 6.63$, $p < .001$. Groups with a leader in a negative mood had a more negative affective tone ($M = 3.31$, $SD = 0.89$) than did groups with a leader

in a positive mood ($M = 2.61$, $SD = 0.31$), $t(54) = -3.98$, $p <$ .001.

Effects of the Leader's Mood on Group Processes

We conducted three analyses at the group level of analysis to examine whether leaders' moods influenced group processes. In each of these analyses, outcomes for groups with a leader in a positive mood were compared with outcomes for groups with a leader in a negative mood by use of standard t tests.

We predicted in Hypothesis 5 that groups with a leader in a negative mood would exert more effort than groups with a leader in a positive mood. This prediction was supported. Groups with a leader in a negative mood exerted more effort ($M = 3.93$, $SD = 0.86$) than did groups with a leader in a positive mood ($M = 2.98$, $SD = 0.83$), $t(54) = -4.17$, $p < .001$.

In Hypothesis 6, we predicted that groups with a leader in a positive mood would exhibit better coordination than groups with a leader in a negative mood. This prediction was supported. Groups with a leader in a positive mood exhibited significantly better coordination ($M = 3.86$, $SD = 0.77$) than did groups with a leader in a negative mood ($M = 3.03$, $SD = 0.86$), $t(54) = 3.78$, $p < .001$.

Finally, we predicted in Hypothesis 7 that groups with a leader in a negative mood would exhibit better task strategy than groups with a leader in a positive mood. This prediction was not supported. Groups with a leader in a negative mood did not exhibit significantly better task strategy ($M = 3.07$, $SD = 0.89$) than did groups with a leader in a positive mood ($M = 3.16$, $SD = 0.90$), $t(54) = 0.34$, $p > .05$.

We explored whether groups with a leader in a positive mood performed better than groups with a leader in a negative mood. There was a difference in group performance between experimental conditions, but this difference was not significant according to traditional standards. Groups with a leader in a negative mood exhibited a higher level of performance ($M = 4.85$, $SD = 1.73$) than did groups with a leader in a positive mood ($M = 4.10$, $SD = 1.50$), $t(54) = -1.74$, $p = .09$.

Mediation Analyses

We conducted post hoc analyses to explore whether group affective tone mediated any associations between leader mood and group processes. Four conditions must be met for a variable to be considered a mediator (Kenny et al., 1998). Criterion 1 is met if the predictor variable (leader mood) is related to the mediator variable (group affective tone). Criterion 2 is met if the predictor variable is related to the outcome variable (group processes). Criterion 3 is met if the mediator variable is related to the outcome variable when the predictor variable is in the equation. Criterion 4 is met if the predictor variable has no effect on the outcome variable when the mediator variable is in the equation. Partial mediation occurs if Criteria 1–3 are met but Criterion 4 is not. We performed four sets of analyses to test whether positive and negative group affective tones mediated relationships between leaders' moods and group effort and group coordination.

Analyses suggested that positive group affective tone fully mediated, and negative group affective tone partially mediated, the association between leader mood and group coordination. Inspec-

tion of Table 3 suggests that Criteria 1 and 2 were met for both positive and negative group affective tone. In a multiple regression analysis, positive group affective tone predicted group coordination ($\beta = .49$), $t(53) = 3.29$, $p < .01$ (meeting Criterion 3), whereas leader mood was a nonsignificant predictor of group coordination ($\beta = -.14$), $t(53) = -0.90$, $p > .05$ (meeting Criterion 4). In another multiple regression analysis, negative group affective tone was related to group coordination ($\beta = -.35$), $t(53) = -2.69$, $p < .05$ (meeting Criterion 3), and leader mood remained a significant predictor of group coordination ($\beta = -.30$), $t(53) = -2.32$, $p < .05$ (failing to meet Criterion 4). This set of analyses suggests that leaders' moods had direct and indirect (through group affective tone) influences on group coordination.

Analyses pertaining to group effort did not suggest mediation. Inspection of Table 3 reveals that Criteria 1 and 2 were met for positive group affective tone. In a multiple regression analysis, however, positive group affective tone did not predict group effort ($\beta = -.03$), $t(53) = -0.20$, $p > .05$, and leader mood remained a significant predictor of group effort ($\beta = .47$), $t(53) = 2.94$, $p < .01$. Thus, Criteria 3 and 4 were not met. Inspection of Table 3 reveals that Criterion 1 was met but that Criterion 2 was not met for negative group affective tone. This set of analyses suggests that leaders' moods had a direct influence on group effort.

Discussion

The present study reveals that the moods of leaders have important consequences in self-managing groups. First, the moods of leaders are transferred to other group members. Individuals with leaders in a positive mood experienced more positive moods and less negative moods after interacting with the leader than did individuals with leaders in a negative mood. The mood contagion from leaders to subordinates was also observed at the group level of analysis. Groups with leaders in a positive mood had a more positive and a less negative affective tone than did groups with leaders in a negative mood. These findings are consistent with conceptualizations of the mood contagion process (Hatfield et al., 1994; Neumann & Strack, 2000).

Our findings extend past research on mood contagion by specifying that leaders transmit their moods to subordinates. Scholars have noted the lack of evidence demonstrating that leaders transmit their moods to their subordinates (Kelly & Barsade, 2001; McColl-Kennedy & Anderson, 2002; Pescosolido, 2002). Our study answered the call for more research in this area by demonstrating that subordinates catch the moods of their leaders. This is not to say that subordinates can never transmit their moods to leaders. Our findings, however, are consistent with recent research showing that high status individuals are more likely to transmit their moods to low status individuals than vice versa (Anderson et al., 2003).

The moods of leaders also influenced two group processes that are critical to group effectiveness (Hackman, 1987). Groups with a leader in a negative mood expended more effort on the task than did groups with a leader in a positive mood. Post hoc mediation analyses indicated that leaders' moods had a direct influence on group effort. That is, the effects of leaders' moods on group effort did not go through groups' affective tones. Also, groups with a leader in a positive mood exhibited more coordination than did groups with a leader in a negative mood. Leaders' moods had both

a direct and an indirect (through group affective tone) influence on group coordination. These findings have important theoretical implications concerning the effects of leaders on subordinates. Displayed moods communicate goals, objectives, and attitudes to other people. In the present study, subordinates presumably interpreted leaders' displayed moods as cues concerning progress toward goal attainment in a performance context (Martin et al., 1993). Subordinates presumably interpreted negative moods as signals that progress was inadequate and that progress needed to be accelerated, leading to high effort. Conversely, subordinates presumably interpreted positive moods as signals that progress was adequate and as invitations to be agreeable. As a result, groups with leaders in a positive mood exhibited better coordination.

Results concerning task strategy did not support our predictions, and they open up opportunities for future research. Groups' generation and assessment of strategies occurred predominantly during the 7-min planning stage before the actual start of the tent-building task. Although there was between-groups variability in task strategy, it is possible that more time was needed for the expected pattern of mood effects to emerge. That is, perhaps 7 min was too short for the mood of leaders to influence groups' strategy development in the ways that we described in our introduction. The results call for additional research on how the moods of leaders may affect strategy development in groups.

Practical Implications

The present study suggests that leaders transfer their moods to group members and that leaders' moods impact the effort and the coordination of groups. More generally, the present study shows that leaders' moods can be powerful forces within groups. Knowledge of the consequences of leaders' moods can improve the prediction of group processes. For example, the findings indicate that groups with a leader in a positive mood will exhibit relatively high coordination on a task.

Currently, leadership courses exist that are designed to increase group performance. These courses cover impression management, team building, group communication, and work design. The findings of the present study accord an important role to the emotional intelligence of leaders in determining the effectiveness of leaders (George, 2000; Goleman et al., 2001). First, leaders must understand the role of moods to be successful. The effects of mood seem to depend on the specific group process involved and the context of the task. Second, successful leaders must efficiently regulate the affective tones of their groups. Leaders who are effective at managing the group's affective tone should have more impact on group processes than will their counterparts. Third, leaders who regulate their mood displays by revealing them or concealing them may influence their groups. It would be beneficial for leaders to learn how to regulate their experiences and displays of moods to subordinates to attain desired outcomes. Our findings suggest that leaders who are inept at regulating their moods could transmit moods that fail to improve group processes. Enhancing leaders' capability in regulation should result in mood contagion that may lead to more effective groups.

Limitations and Future Research

We interpret the findings to suggest that leaders' mood impacts group members' mood, group affective tone, and group processes.

At this point, however, we cannot make definitive statements about the precise mechanisms that underlie the effects of the mood of the leader. An anonymous reviewer pointed out that the leadership functions of influencing people, building relationships, giving and seeking information, and making decisions (Yukl, 1989) may have mediated the observed associations between leaders' moods and group members' mood, group affective tone, and group processes. For example, leaders' experiences of positive mood may have improved their own ability to carry out leadership functions that, in turn, may have resulted in positive mood in the group members. Our mediation analyses shed some light on mechanisms linking leaders' moods to group processes by showing that leaders' moods could have a direct impact on group effort and have both a direct and an indirect impact on group coordination. Even so, future research should explore other plausible mechanisms that may underlie our findings.

A second limitation of this study is that we explored only the direction of mood contagion from leaders to subordinates. It is possible that subordinates transfer their mood to leaders. Past research has found that confederates in experiments (Barsade, 2002) influence the moods of other individuals of the same status. Furthermore, Bartel and Saavedra (2000) found mood convergence in a variety of work groups. Although our study is the first to test the directionality of mood contagion in an explicit leadership context, we tested only one direction. Future research should explore the degree to which subordinates transmit their moods to leaders.

Another limitation of the present study is that the duration of the effects of leader mood is not known. The study examined the effects of the mood of the leader during a short task. In reality, most tasks require more time to complete. We do not know whether the effects persist for longer tasks or dissipate for tasks requiring more time to complete. Future research should investigate the duration of the effects of leaders' moods and factors that might shorten or prolong these effects.

As a caveat, leaders should be cautioned on the usage of negative mood to boost effort. Constant and prolonged displays of negative mood from the leader could have detrimental outcomes. Future research should examine the impact of the mood of the leader on the capability of group members to work together on subsequent tasks and the satisfaction or frustration of group members' personal needs, as these factors could influence groups' subsequent ability to function effectively.

Finally, we believe the present study marks the first steps toward bridging the conceptual gap between leadership and mood (Caruso, Mayer, & Salovey, 2002; George, 2000). Although the importance of mood in leadership has been acknowledged in various theoretical models, few studies have directly investigated this relationship. Studying the role of mood in established theories of leadership represents an important avenue for future research. For example, the leader–member exchange theory of leadership (Dansereau, Graen & Haga, 1975; Graen, 1976; Graen & Cashman, 1975) does not fully explain how to build quality relationships. The social functions of affect represent a potential avenue for building strong relationships such as the ones described in leader–member exchange theory. Future research may also explore the role of mood in transformational leadership (Bass, 1998; Burns, 1978).

In conclusion, our study provides evidence indicating that mood plays an important role in the leadership process. As an anonymous reviewer pointed out, it is interesting that researchers have left affect out of theoretical models of leadership for so long. This is partly due to a historical preference in the organizational literature for cognitive constructs (Ilgen & Klein, 1989). Affect is now increasingly considered in models of leadership. People have risen to the forefront as perhaps the most important resource for any organization within the context of a global knowledge economy. This stands in contrast to the Industrial Age when machinery was primary and factory workers were secondary. Further evidence of this shift is supported by the increasing use of self-managing groups to leverage the knowledge of employees (Lawler, 1998; Stewart & Manz, 1995; Walton, 1985). With growing awareness of the importance of workers, managers are continuously looking for ways to leverage their human resources. As such, affect is receiving increasing attention in the study of leadership (e.g., George, 2000; Goleman, 1995). The study of affect in organizations appears to have gathered critical mass with the establishment of networks of practitioners and researchers. Whereas affect was once regarded as detrimental or unprofessional, the trend suggests that affect is increasingly accepted as an important factor contributing to the performance of organizations. As affect continues to be regarded as a legitimate component of organizational life and as knowledge accumulates, managers can begin to effectively integrate and leverage affect to facilitate performance.

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