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The Collective Construction of Work Group Moods

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This research examines mood as a collective property of work groups. We argue that work group members experience group moods when they can detect and display mood information through observable behavioral expressions. To test the hypothesis that work group moods are manifested behaviorally, we developed an observational instrument and compared observers' reports of work group mood with self-reported measures from 70 work groups. As predicted, groups converged for eight distinct mood categories, and observers' reports of work group mood were consistent with groups' aggregated self-reported values. Convergence in members' moods was positively associated with task and social interdependence, membership stability, and mood regulation norms. Theoretical and practical implications of work group mood are discussed.●

The affective experiences of work group members are a defining aspect of group life and are receiving increasing attention from researchers. The importance of individuals' affective states is implicit in numerous psychological and organizational theories of work group interaction and performance. For example, conflict has been conceived as both an antecedent and consequence of negative affective experiences such as apprehension, aggression, or nervousness (Jehn, 1995; Levine and Thompson, 1996). Research in symbolic management (Van Maanen and Kunda, 1989; Schneider, 1990) has emphasized that emotion evoked in others can then be directed toward group or organizational goals. Similarly, research on the emotional labor of service workers illustrates how individuals can infect others with emotion to create particular affective climates that promote group or organizational objectives (Hochschild, 1983; Sutton and Rafaeli, 1988; Sutton, 1991). Several scholars have asserted that work group members come to develop mutually shared moods and emotions in the course of executing their tasks (Smith and Crandell, 1984; Sandelands and St. Clair, 1993; Barsade and Gibson, 1998; Totterdell et al., 1998). The concept of collective mood, however, has received little empirical scrutiny. Exceptions include research by George (1990) and Barsade (1998). George showed that work groups can develop affective tones, defined as consistent or homogeneous affective reactions among members. George concluded that when the personal disposition of most group members is to experience positive (or negative) mood states, then the affective tone of the group as a whole becomes positive (or negative) as well. Barsade (1998) argued that work group members may share group emotions as they perform their task and that these emotions may result from a subtle but continuous transfer of affective states among members.

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In the research presented here, we sought to make both conceptual and methodological contributions to an emerging research domain that portrays mood as a collective property of work groups. Three issues seem to be critical to advancing current theorizing about work group moods. First, there is scant research detailing the range of mood states that may be associated with work group life. Thus far, most research *has looked at positive and negative affect as significant determinants of both individual and group behavior. We know little*

about the range of possible collective moods and their relative instantiations in work group settings. As in previous research on positive and negative affective states, we must also demonstrate that aggregated self-reports of various individual mood states indicate collective moods.

Second, various features in a work group's context are apt to influence the formation of collective moods among members. Building on the idea that group members come to share similar moods in the course of executing their tasks, we need to identify work group features associated with collective moods. Efforts thus far have examined individual differences among members (George, 1990; Barsade, 1998) but have not explored other work group features that shape members' interactions, such as social norms and members' relationships (Sundstrom, De Meuse, and Futrell, 1990). In this research, we investigated work group features that may influence the behavioral communication of work group moods. Finally, the third issue concerns the need for reliable methods for assessing work group moods. Although self-report measures provide a suitable index (George, 1990), identifying alternative methodologies may afford researchers greater flexibility in examining work group moods in settings where self-report measures are impractical or imprudent (i.e., risk of common source bias). Accordingly, we devised an observational instrument for assessing moods in group settings, which we used to examine collective mood in 70 diverse work groups.

WORK GROUP MOOD

Understanding mood as a collective property of work groups is critical for both theoretical and practical reasons. A basic principle in work group research is that coordinated action is best accomplished when individuals can synchronize their thoughts, feelings, and behavior (Hackman, 1992). Corollary evidence for this argument can be found in human evolutionary theories that assume that social behavior is often nonrandom, patterned, or synchronized in both timing and form. Evolutionary theorists maintain that groups are functionally adaptive because they optimize the effectiveness with which individuals interact with their environment. Because the probability of survival outside of group contexts is greatly diminished, a shared reality takes precedence over a member's own experience in situations in which coordinated behavior leads to greater task success than individual efforts (Caporael, 1997). Biologists as well as social scientists in various disciplines maintain that interactional synchrony, the degree of congruence in the thoughts, feelings, and behaviors of two or more people, is critical to maintaining and facilitating social interaction and, thus, effective group functioning (Burgoon, Steen, and Dillman, 1995).

Research on individuals shows that certain moods heighten motivation to achieve particular outcomes, promote selective attention toward outcome-relevant information, and increase action readiness toward the attainment of those outcomes (Forgas, 1992). For work groups, collective moods may help to produce a normative affective aptitude for social situations and may affect members' motivation to attain collective goals

(Hackman, 1992). This notion is reflected in theories of group development (Bennis and Sheppard, 1956; Smith and Berg, 1987), in which scholars have argued that social-emotional activities operate to reinforce, guide, and regulate task-oriented behavior. Certain work group moods may help to promote congruence in members' attention, effort, and persistence, which, in turn, may stimulate well-coordinated patterns of behavior (i.e., task strategies) toward collective goals.

Members' moods are one of the ambient stimuli to which work groups are exposed in the course of their organizational activities and are potentially available to all members as a regular part of their life in the group (Hackman, 1992: 201). Among the most influential types of ambient stimuli are other work group members, the nature of the task, and aspects of the work environment. By implication, behavioral expressions of mood by individual members constitute ambient stimuli because such expressions are available to all group members. Ambient stimuli are rarely noticed and discussed but, rather, provide the backdrop for group functioning. Accordingly, moods serve as filters through which work groups perceive and enact their tasks (Barsade and Gibson, 1998) and are intimately linked to members' abilities to appraise and interpret actions and events.

To study work group mood, one must first distinguish among affect, emotion, and mood. Affect reflects a broad and inclusive label that refers to both emotions and moods. Moods can be distinguished from emotions in terms of duration, object focus, and response (Frijda, 1993). Emotions (e.g., joy, anger, fear) denote brief reactions to particular persons or events, whereas moods are relatively enduring (i.e., duration of minutes to days) affective states that lack an object to which the affect is directed. This does not mean that moods lack a precipitating person or event, only that the phenomenal experience of mood does not include the causal factor. Weiss and Cropanzano (1996) noted that moods result not only from specific experiences but also as a by-product of emotional reactions. Although it is possible to explain a mood by pointing to its source, individuals tend not to do so, which is why moods are characterized as being diffuse or global as compared with emotions. Moods also differ from emotions in terms of elicited responses. In contrast to emotions, moods have more subtle and pervasive effects on individuals' thoughts and behaviors that are unrelated to the original source of the mood (Isen and Baron, 1991; Frijda, 1993). In the current research, we focus on work group moods as diffuse and relatively enduring affective states that are shared by group members.

Mechanisms for Mood Convergence in Work Groups

Scholars have long recognized that experienced emotions and mood states manifest themselves behaviorally. Individuals have an innate capacity to communicate their own feelings as well as to ascertain the feelings of others by observing their gestures and vocalizations (Ekman and Davidson, 1994). Nonverbal behavior is a source of information about others' feelings and attitudes that is reliable and readily available to individuals in social situations. As such, nonverbal

behaviors constitute a primary medium for the communication of affect. Ample documentation exists to show that many emotions are associated with distinct patterns of facial movement (Ekman and Keltner, 1997; Russell, Fernandez-Dols, and Mandler, 1997), vocal intonation, rhythm, and pausing (Kappas, Hess, and Scherer, 1991), and muscular contractions (Duclos et al., 1989). Moods are also conveyed behaviorally, but less attention has been given to the facial, vocal, and postural cues that distinguish various moods (Ekman and Davidson, 1994). Nonetheless, research on nonverbal behavior supports the contention that observable behavioral cues provide useful information that work group members can use to decode the moods felt by other members.

Theories of emotional comparison and emotional contagion emphasize the utility of interactional synchrony, focusing on the processes that promote affective coordination in social interactions. Emotional comparison and contagion are two possible processes that enable work group members to adapt to observable mood information in their task environment. These frameworks explain that individuals use two types of cues to synchronize their moods with others: self-produced cues and situational cues. Self-produced cues include perceptions of one's own expressive behaviors, whereas situational cues include perceptions as to what most others' expressive behaviors mean in a given situation.

Emotional comparison. In his classic work on stress and affiliation, Schachter (1959) extended Festinger's (1954) social comparison theory to the realm of emotion, proposing that individuals in ambiguous and physiologically arousing situations will seek out and use cues from similar others (i.e., others in the same situation) to label their aroused state. Such individuals provide the most accurate gauge for evaluating the intensity, nature, or appropriateness of one's own emotional state. Both situational and self-produced cues contribute to emotional experience. Comparisons determine the specific emotion that is felt, and one's level of physiological arousal can help determine how intensely that emotion is felt (Schachter and Singer, 1962). As Salancik and Pfeffer (1978) noted, individuals use available information in their immediate environment to determine appropriate feelings for particular situations, even when they are not especially aroused. Gump and Kulik (1997) and Sullins (1991) suggested that emotional convergence may be based on individuals' evaluations of available emotional information. Individuals use discretionary behavioral expressions to communicate what they perceive is the correct emotional response to a particular situation (Hackman, 1992). This information may then become the basis of emotional comparisons within the group. For example, observing others sneering, scowling, or grimacing suggests that the situation is threatening. Thus, the evaluation of available emotional information can influence individuals' appraisals, shape their emotional reactions, and produce emotional convergence among them. The concept of emotional comparison is illustrated in Sutton's (1991) analysis of how bill collection organizations often use open office designs so that novice collectors can gather behavioral cues

from seasoned collectors to determine which emotions they should experience when communicating with debtors.

Emotional contagion. Instead of emotional comparison, Hatfield, Cacioppo, and Rapson (1992, 1994) favor a model of primitive emotional contagion, defined as the tendency to automatically mimic and synchronize facial expressions, bodily movements, and vocalizations with those of another person and, consequently, to converge emotionally. Behavioral mimicry is a form of entrainment, a term that originated in biology, which reflects spontaneous adjustments in behavior to match or synchronize with the behavior of another. McGrath and Kelly (1986: 43) described entrainment with an analogy to a tuning fork, noting that if a tuning fork is set into motion by an external force and then held near another tuning fork of a similar frequency, it will set that second tuning fork into motion as well. The fundamental idea behind entrainment is that coordinated behavior is essential for effective social interactions.

Behavioral mimicry and synchrony can lead individuals to become emotionally in tune with others in two ways. First, individuals tend to feel the emotions consistent with the facial, postural, and vocal expressions they mimic (Duclos et al., 1989). Interacting with others who are smiling may lead a person to automatically mimic and synchronize his or her facial expressions and, consequently, to experience the pleasant affective state that matches such expressions (e.g., happy, cheerful). Thus, self-produced cues that are processed automatically and generally outside of conscious awareness promote emotional contagion in social settings. A second link between behavioral mimicry and emotional convergence involves a conscious self-perception process wherein individuals make inferences about their own emotional states based on their own expressive behavior. This view builds on the work of Bem (1972) and other attribution theorists who have argued that individuals come to know their own feelings by inferring them from their own overt behavior. To the extent that internal physiological cues are weak or ambiguous, an individual is functionally in the same position as an outside observer who must rely on behavioral cues to infer another individual's mood.

Evidence of emotional contagion appears in social psychological, organizational, and sociological research. For example, Le Bon (1896) was interested in the group mind and the madness of crowds, while other sociologists used a contagion lens to interpret historical instances of mass hysteria. Examples include the dancing manias that pervaded Europe in the Middle Ages (Hecker, 1970) and the wave of panic that followed the 1938 U.S. radio broadcast of *The War of the Worlds* by Orson Welles (Cantril, 1940). Behavioral scientists have also discussed how emotions seem to be transferred automatically and spontaneously between individuals in various social contexts, including clinical therapy sessions (Hatfield, Cacioppo, and Rapson, 1992), sporting events (Snyder, 1990), workplace settings (Ash, 1984; Pratt, 1994), and task environments (Barsade, 1998).

Collective Construction of Work Group Moods

Our conceptualization of work group mood positions comparison and contagion processes as complementary forces that produce mood convergence. But although afferent feedback from facial, postural, or vocal mimicry can elicit physiological arousal and produce corresponding mood states among group members (i.e., contagion), the meaning or significance of such moods will, at times, be ambiguous. In these situations, group members can make sense of their moods in terms of the social environment in which the moods are experienced. This requires scanning the group for mood information and using behavioral cues displayed by others to evaluate the intensity, nature, or appropriateness of certain mood states (i.e., comparison). Thus, work group moods are constructed socially, involving the complex interplay of contagion and comparison processes that are triggered by behavioral expressions of mood. This view differs from George's (1990) demography approach, which suggests that attraction, selection, and attrition processes produce groups comprising members with similar personality dispositions who, in turn, experience certain mood states. We suggest that mood convergence in work groups may occur when individual members extract observable mood information from their group and reenact that mood in the system. Thus, the collective construction of work group mood results from mood information (e.g., facial expressions, vocal patterns, and postural movements) that is exhibited by group members in the course of executing their tasks. Individual moods that are not expressed behaviorally cannot be detected by other group members and, thus, remain private. From this, we hypothesize that outside observers as well as members should be able to decode work group moods based on members' behavioral expressions:

Hypothesis 1 (H1): Work group members will demonstrate convergence in aggregated self-reports of mood.

Hypothesis 2 (H2): Observers can detect accurately various work group moods based on behavioral cues (facial, vocal, and postural).

Event Structures Promoting Mood Convergence

Allport (1955) suggested that collective concepts could be specified by denoting event structures, defined as the ways in which individuals are interdependent on both a task and social basis. Weick and Roberts (1993) explained and illustrated the notion of event structures in their conceptualization of collective mind. To Weick and Roberts, collective constructs should be studied as a system of social interaction. Although the most basic unit of analysis in a social system is the individual behavioral act (Allport, 1955), mutual dependence between individuals creates a context for continual interaction. Weick and Roberts (1993: 366) explained that collective constructs emerge from a "set of ongoing interactions in a social activity system from which participants continually extract a changing sense of self-interrelation and then reenact that sense back into the system." Such patterns of interaction can be viewed as double interacts, in which the behavior of an individual (an act) is likely to evoke a response

from another person (an interact), which, in turn, serves as a stimulus to him or her that prompts further action, completing a double interact (Weick, 1979: 155). Ongoing patterns of interaction form the basis for the eventual emergence of collective constructs, with event structures consisting of those properties of the social system that determine such interactions.

From the perspective of event structures, work group mood can be seen as a collective construct that inheres in the pattern of interrelated activities among members. Following Rafaeli and Sutton's (1987: 28) description of emotional transactions, the initial mood displayed by a group member can stimulate, perhaps through comparison or contagion, another member to respond with behavioral feedback that is consistent with the displayed mood. The original sender may then react by maintaining the displayed mood or by modifying it. Through this process, work group members extract mood information from the group and reenact those moods in the group, thus cultivating a shared affective reality. To denote event structures that influence mood convergence, it is necessary to examine features of a work group's social system that affect the degree to which members can disseminate and acquire behavioral mood information during group interactions. Sundstrom, De Meuse, and Futrell (1990) used the term team development to refer to features that shape a group's internal functioning, such as group design and interpersonal processes. There are four developmental features that may affect mood convergence: membership stability, mood-regulation norms, and experienced task and social interdependence.

Membership Stability and Mood-regulation Norms

Elements of a work group's design that affect patterns of interaction and social influence among members include the continuity of group membership (Katz, 1982; O'Reilly, Caldwell, and Barnett, 1989) and the level of familiarity among group members (Goodman and Shah, 1992). Such features may also influence the dissemination and acquisition of behavioral mood information. Membership continuity and familiarity describe the frequency and duration of contact among group members and reflect the level of intimacy among members based on a group's history of interactions and on prior extragroup experiences (e.g., contact with members prior to group formation). These two dimensions reflect the overall stability of work group membership. Membership stability may influence mood convergence because frequent and continued interactions create opportunities for members to both demonstrate and detect behavioral mood information that can shape a group's collective mood. Group members who are familiar with one another may become adept at decoding other members' mood expressions (Halberstadt, 1986). Repeated exposure to group members enables individuals to learn the subtleties of members' facial, vocal, and postural expressions for various moods. Accurate appraisals can shape members' reactions toward a collective frame and, consequently, produce mood convergence in a work group. More formally, we predict the following:

Hypothesis 3 (H3): The greater the stability of work group membership, the greater the degree of mood convergence.

Mood convergence in work groups may also stem from social norms that guide members' mood expressions during task interactions. Social norms are a developmental feature of work groups, resulting from members' interactions that create guidelines for appropriate behavior in certain situations and under certain circumstances (Levine and Moreland, 1998). Social norms are a powerful means of social influence, as members understand and follow them even when they are not stated explicitly. Social norms often exist about what moods ought to be publicly expressed as part of an individual's work role. Ekman (1973) coined the term display rules to describe affective norms that prescribe not only which moods are expected in a given situation but also how those moods should be conveyed behaviorally. Research on service workers shows that display rules can be explicit and are often institutionalized in orientation seminars, training protocols, employee handbooks, and in the direct supervision of employees' behavior (Rafaeli and Sutton, 1987; Van Maanen and Kunda, 1989). In Sutton's (1991) investigation of bill collectors, for example, conveying urgency and unpleasantness were the normative beginnings for most telephone conversations, but collectors were also expected to follow contingent norms for adjusting their expressed emotions to a debtor's demeanor (e.g., convey a calm or neutral tone to angry debtors). Display rules can also be conveyed through informal interactions with coworkers. For example, novice police detectives often learn which emotions to express on the job through war stories told by seasoned officers (Van Maanen, 1973), whereas medical interns discover appropriate moods for conversations with patients through observation and imitation of hospital physicians (Smith and Kleinman, 1989). Ashforth and Humphrey (1995) speculated that norms for mood expressions may apply to any organizational role involving interpersonal interaction. Such norms should also develop in work groups, where members interact.

Norms for mood expressions can communicate context-specific information about what constitutes customary social behavior in a given setting. Such norms can guide the breadth (type of moods), depth (number of nuances in behavioral expression), or intensity (how strongly it is expressed) of moods that members exhibit while performing their tasks. Like display rules, norms for mood expressions influence individual behavior in a work group because they provide consensus information about actions that have a high probability of being conventional (Cialdini, Reno, and Kallgren, 1990). When most members of a work group respond similarly to a specific situation, it signals that the behavior is appropriate, and it appeals to the needs to fit in the group (Cialdini and Trost, 1998). By observing what others are doing, members can make judicious and efficient choices about how to behave in that context. Individuals are usually aware of existing norms in a group and act in accordance with them. Norms for mood expressions can be thought of as an element of a group's design because, like other social norms, they develop early in a group's life and tend to persist until changes in the group (e.g., composition) or its organiza-

tional context (e.g., performance feedback) suggest that they are no longer effective.

Hatfield, Cacioppo, and Rapson (1992, 1994) noted that although individuals differ in their susceptibility to emotional contagion, social norms can influence the degree to which they catch another's emotions in interpersonal settings. The possibility of emotional contagion increases when individuals involved in repeated interactions develop normative tendencies to monitor carefully their interpersonal surroundings so that they attend to, interpret, and respond to nonverbal emotional cues. Responses may be expressed cognitively (e.g., experiential states), physiologically (e.g., neurophysiological arousal), and behaviorally (e.g., expressive and instrumental behaviors). Mood convergence in work groups may be influenced by social norms that lead members to attend closely to behavioral cues that signal other members' moods so as to adjust their behavior accordingly. We refer to such norms as mood-regulation norms. Members of work groups in which such norms prevail are more likely to compare and evaluate their own feelings relative to other members in the process of determining which moods are appropriate in a particular situation. Group members are also likely to mimic and synchronize their expressions with others in the course of observing their behavior. Afferent feedback from facial, vocal, or postural movements can enable members to catch the moods that match such behavioral expressions (i.e., contagion), producing mood convergence. Thus, we expect that mood convergence in work groups will be enhanced when members develop normative tendencies to adjust their affective responses to match such mood information:

Hypothesis 4 (H4): The more a work group possesses mood-regulation norms, the greater the degree of mood convergence.

Task and Social Interdependence

Another factor that can influence mood convergence in work groups includes how individuals construe their relations with other members. Individuals are generally more likely to converge emotionally if they regard others in terms of inter-relatedness rather than independence (Hatfield, Cacioppo, and Rapson, 1994). Extending this basic principle, mood convergence is more likely in work groups with high levels of task and social interdependence.

Among the sources of experienced interdependence in work groups, the task is the core source of relatedness (Hackman, 1992). Task interdependence refers to the interconnections among the tasks of group members, reflecting the degree to which members rely on one another to accomplish their work (Van de Ven and Ferry, 1980). Although the degree of task interdependence is partly determined by the requirements and constraints inherent in the technology or design of the task (Goodman, 1986), it is also a function of the way group members choose to plan, coordinate, and execute their activities (Saavedra, Earley, and Van Dyne, 1993). High task interdependence makes salient a collective sense of responsibility and increases the need for collaboration and mutual adjustments among group members (Wageman, 1995). This

often produces pressures within groups to establish a unified strategy so that members can organize, coordinate, and execute their tasks effectively (Gersick, 1988). To do so, members must synchronize their thoughts and behavior, as well as their feelings. High task interdependence may promote member convergence in terms of a shared approach to the task as well as shared mood, perhaps because such conditions increase the reliability of members' behavior, allowing for well-coordinated action. Thus, high task interdependence may promote emotional comparison of mood information among members to evaluate their own feelings relative to others and to determine appropriate feelings for particular situations. The intense communication and interaction required by high task interdependence provide members with opportunities to gather mood information and may encourage behavioral mimicry for actions required to execute the collective task. Accordingly, higher levels of experienced task interdependence should be associated with greater degrees of mood convergence in work groups:

Hypothesis 5 (H5): The higher the level of task interdependence in a work group, the greater the degree of mood convergence.

A second source of experienced interdependence in work groups derives from the quality of interpersonal relations among group members. Social interdependence or cohesion reflects the psychological tie that binds members to a group, including the degree to which members are attracted to each other and the group as a whole, and their desire to maintain membership in the group (Levine and Moreland, 1998; Hackman, 1992). Social roles that lead individuals to make a psychological investment in others may promote contagion (Hatfield, Cacioppo, and Rapson, 1994). Generally, individuals mimic the behavior of those to whom they feel close, and they feel close to those who mimic their behavior. This suggests that greater social interdependence can increase sensitivity to others' needs, leading work group members to be more attentive to other members' moods. This may increase the likelihood of automatic behavioral mimicry and the possibility of mood convergence.

Social interdependence also functions as a form of social influence that motivates uniformity of thought, feeling, and behavior based on the dispensation of interpersonal rewards (Hackman, 1992) and may increase uniformity in members' behavioral expressions of mood. Conformity pressures associated with social interdependence may lead members to scrutinize observable mood information, to evaluate their own moods relative to others, and to adjust their moods to match those displayed by other members. For these reasons, a high level of social interdependence in work groups should be associated with greater mood convergence among members:

Hypothesis 6 (H6): The higher the level of social interdependence in a work group, the greater the degree of mood convergence.

Modeling Work Group Mood

We used the circumplex model of mood shown in Figure 1 as an organizing framework to explore the range of moods that work groups may experience collectively. According to the circumplex model, all moods share two basic, orthogonal dimensions (Larsen and Diener, 1992). One dimension reflects hedonic valence (pleasant-unpleasant), and the second dimension includes behavioral readiness or arousal (high or low activation). A plot of 48 mood adjectives results in a circular structure relative to these two dimensions. At 45 degrees to the high-low activation and pleasant-unpleasant dimensions, two additional dimensions further divide this circumplex structure. These two orthogonal dimensions reflect a composite of hedonic valence and activation (activated-pleasant versus unactivated-unpleasant, and activated-unpleasant versus unactivated-pleasant). Together, the four bipolar dimensions of the circumplex model produce eight mood categories that capture almost the full range of affective experiences across individuals (Larsen and Diener, 1992). This mood structure creates mood categories that are symmetric, fully dimensional, and reflect the content of the mood

Figure 1. The self-report circumplex model of mood (Larsen and Diener, 1992).
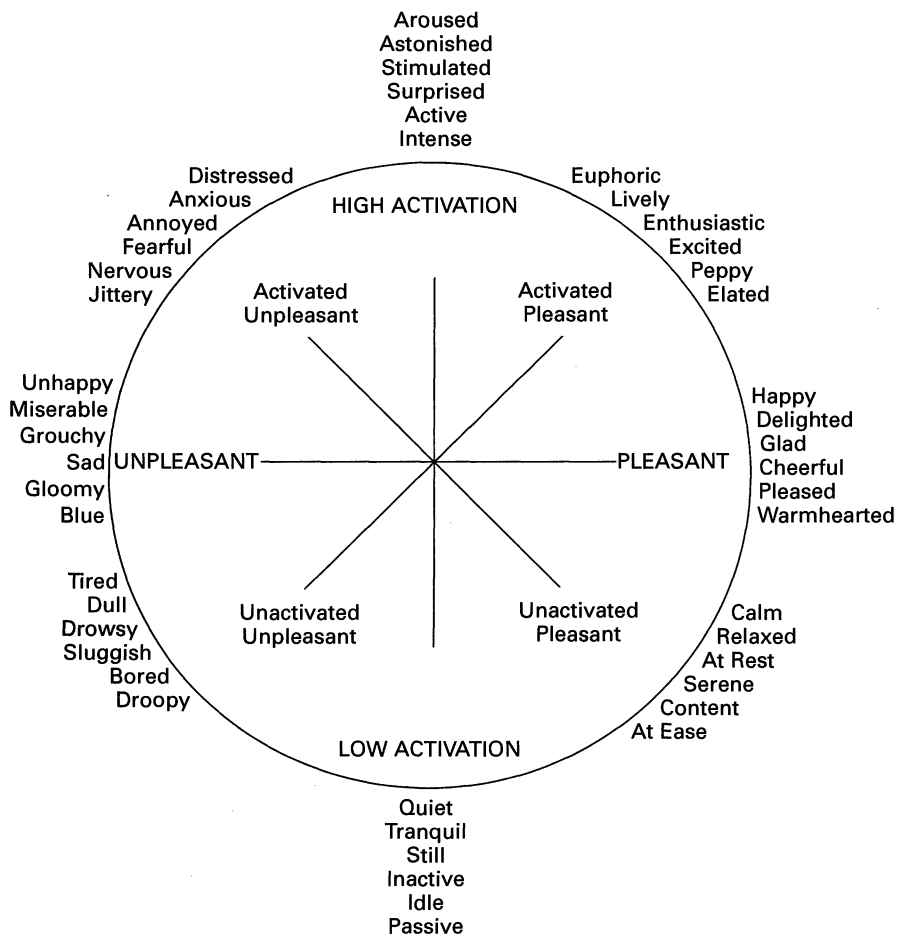
states they represent. The dimensional structure of the circumplex model as well as its eight component mood categories have received strong empirical support (Larsen and Diener, 1992; Weiss and Cropanzano, 1996). By using the mood circumplex model, we explored empirically the degree to which work groups experience a broad range of affective states.

Larsen and Diener (1992) noted that one limitation of previous circumplex research is that it is mainly self-reported judgment data. The circumplex model, however, provides a mapping of the moods that individuals experience internally and express behaviorally and that observers can therefore detect in a group setting. As described below, we used the mood circumplex in this way as the basis for constructing an observer's instrument to assess eight work group moods by means of behavioral (facial, vocal, and postural) cues.

METHOD

Construction of an Observer's Instrument for Work Group Mood

For mood to converge in work groups, it should be observable to individual members. To validate this conceptualization of work group mood we created an observer's instrument that permits behavioral assessments of different mood states. Sixteen three-person research teams were charged with developing behavioral indicators related to the eight categories of the mood circumplex model. The members of these teams were 48 undergraduate students (28 female, 20 male) participating in an organizational psychology laboratory course. We asked each team to develop behavioral indicators for two of the eight mood categories, thus, four teams identified observable behaviors for each category of the mood circumplex model. These behavioral indicators were to be used as mood information that could be detected by observers in a group setting. We informed teams that facial, vocal, and postural expressions should relate to the six adjectives describing each mood category. For example, behavioral cues for pleasant mood (e.g., cheerful, happy, delighted) could include slightly raised eyebrows (facial), an even speech pace (vocal), and tilting one's head toward others (postural). We proposed that teams identify a set of 15–20 indicators for each mood category (i.e., approximately six facial, six vocal, and six postural indicators). To develop these behavioral indicators, we advised teams to spend time observing small groups in public places and to engage in role-playing exercises, such that two team members acted out a specific mood experience while the third team member took notes on their behavioral expressions.

After the research teams developed an initial set of behavioral indicators, we paired teams that had developed indicators for the same two mood categories to accentuate common information between teams and reduce variability in teams' recommendations of behavioral indicators. Paired teams were given two hours to discuss, revise, and choose a preliminary set of indicators that best described their mood categories. We then edited the preliminary draft of facial, vocal, and postural indicators for the circumplex model to

maximize differentiation while also preserving naturally occurring overlays (e.g., activated pleasant mood is a composite of pleasant mood and high activation). Teams then used these behavioral indicators to code mood information in a 30-minute video clip from the motion picture *Twelve Angry Men* (1958). Teams were randomly assigned two mood categories different from those for which they had developed behavioral indicators. We supplied each team member with a list of the facial, verbal, and postural indicators that other teams had generated for these mood categories. After familiarizing themselves with these cues, team members independently coded the video clip by placing check marks next to the indicators they observed, each time they observed them.

Teams were then paired with another team that coded the video clip using the same mood categories and set of behavioral indicators. We assigned paired teams the task of producing a report that evaluated the utility of these behavioral indicators for coding group interactions. We used these reports to further edit the list of behavioral indicators for coherence and clarity. We then repeated this editing process, having teams code a second 30-minute video clip from the motion picture *Wall Street* (1987) and produce a report that evaluated the set of indicators they used. The final set of behavioral indicators for the eight mood categories used in the observer's instrument for work group mood, shown in Appendix A, reflects the final iteration of the editing process. The facial, verbal, and postural cues listed in Appendix A constitute observable mood information that is salient to individual members during group interactions.

Method Overview

Thirty-five three-person observer teams were created and charged with the responsibility of identifying and then contracting with two organizational work groups to participate in the study. The members of these observer teams were undergraduate students (58 female, 47 male) participating in an organizational psychology laboratory course over a two-semester sequence. Participation in this study constituted the field research portion of the laboratory course and comprised 25 percent of students' course grade. Observer teams were asked to identify work groups that conformed to a well-supported definition of work groups by Guzzo and Dickson (1996: 308–309): "A work group is made up of individuals who see themselves and who are seen by others as a social entity, who are interdependent because of the tasks they perform as members of a group, who are embedded in one or more larger social systems (e.g., community, organization), and who perform tasks that affect others (such as customers or coworkers)."

Observer teams contracted with organizational representatives for permission to observe work groups for a two-hour period and to have work group members complete a self-report survey with items on mood states, work group mood-regulation norms, task and social interdependence, and demographic information. Observer teams also obtained permission to gather self-report survey data from work groups' supervisors about work group design and membership stabili-

ty. Supervisors were those individuals to whom work groups reported in the organizational hierarchy but who were not active members of the work group.

Sample

We obtained a sample of 70 work groups that fit the parameters of the study. Work groups comprised four to eight members (mean = 5.10), resulting in a sample of 357 participants. The sample included work groups that performed diverse tasks in 51 assorted organizational contexts. Ten work groups created specific products, such as automotive tool designers, Internet web-site designers, and creative advertising teams. Twenty-one work groups provided services to identifiable clients and included preoperative surgical nurses, retail sales teams, flight attendants, customer service representatives, partners in a law firm, bill collection agents, and computer technicians. The central task of 15 work groups included strategic planning and decision making. Examples included a nonprofit fund-raising group, bank loan committees, juvenile court case-management teams, and strategic human resources teams. Fourteen work groups generated solutions to organizational problems and included engineers, management consultants, and public relations coordinators. Finally, ten work groups executed athletic (e.g., separate five-man units of a professional hockey team), dramatic (e.g., improvisational comedy troupe), or musical performances (e.g., string quartet).

The average age of work group members was 32.4 years, and 47 percent were male. The majority (76 percent) of participants were members of their work group for a period of six months to one year (10 percent for less than six months, 14 percent for more than one year), and 68 percent of the work groups were expected to remain together for one or two years.

Data Collection Procedure

We provided observer teams with a procedure for assessing work group mood using the observer's instrument for work group mood. The first step required observers to learn the facial, vocal, and postural indicators for each mood shown in Appendix A. Observers were advised to practice with these cues, preferably by coding several 15–20 minute video clips, until they were well versed in using them. Observer teams were required to spend two hours directly observing each of their work groups. We recommended that observer teams make arrangements to observe their work groups at a time when members would be actively engaged in their tasks. Because we sought to minimize client, customer, and audience influences on work group moods, we advised observer teams to conduct their observations at a time when members would interact mainly with one another. For service groups, observer teams viewed planning, trouble-shooting, or debriefing meetings. For performance groups, observer teams viewed practice or rehearsal sessions.

In the second step, observers conducted individual assessments of work group mood. We instructed observers to familiarize themselves with the indicators and then to use

them to conduct their assessment of a work group, positioning themselves so as to observe all work group members as they executed their tasks. We instructed observers not to divide up the work in any way among themselves, asking each observer to monitor all work group members and place a check mark on the assessment sheet each time a member exhibited a behavioral indicator.

In the third step, observer teams collected self-report data from work group members through a survey administered at the conclusion of the observation session. While work group members completed the survey, observer teams met to formulate collectively an assessment of work group mood. We instructed members of the observer teams to compare their individual ratings to arrive at their team's assessment of the relative strengths of the moods that were exhibited in the work group observed. We asked them to rate each mood category of the circumplex model on the form for the observer-team assessment of mood, indicating how much each mood category was exhibited in the work group they observed (0 = not at all, 6 = a great deal). We asked them to provide a separate, detailed description of the procedure the team used to achieve consensus and generate ratings for each mood category and of the types of indicators that were the major drivers in the team's ratings of each mood category. Following the recommendations of Guzzo et al. (1993), we required each observer team to achieve consensus on the assigned values for the eight group mood categories. Thus, our observed group mood scores captured a group-level phenomenon without aggregation. We reasoned that using observer teams as information processors would increase reliability and reduce variability in assessments of work group mood. Groups tend to share common information more than unique information, demonstrate consistency in the procedures used to process information, and, thus, produce more accurate judgments than individuals (Hinsz, Tindale, and Vollrath, 1997). We told observer teams that their assessments would be compared with aggregated self-reported values from the work groups they observed. Such instructions were intended to create an expectation that observers were seeking a demonstrably correct response (i.e., an intellective task). Intellective tasks generate considerable information sharing (Stasser and Stewart, 1992) and emphasize encoding to ensure that group members have a thorough understanding of the task (Hinsz, Tindale and Vollrath, 1997). Given these prompts, observer teams were primed to forge individual representations of information with an eye for shared interpretation.

We obtained a 100-percent response rate for the self-report surveys, with all 357 members from the 70 work groups having completed the questionnaire. Obtaining this response rate was a condition that observer teams negotiated at the entry phase of the study. The final step of data collection was for observer teams to gather self-report survey data from the work group's supervisor on work group design and membership stability. Observer teams distributed the supervisor surveys immediately after the observation session and then retrieved them one or two days later.

Following data collection, observer teams were asked to pre-
pare a summary report that would enable further refinements
to the observer's instrument for work group mood. Ques-
tions centered on the strategies teams used to rate the pres-
ence of each work group mood, the degree to which various
mood categories were readily observable, and the usefulness
of various types of indicators (facial, vocal, and postural) for
assessing work group mood.

Survey Measures

Event-structure properties. Supervisors provided informa-
tion on group membership stability using items from Hack-
man's (1982) "Guide for observations of work teams."
Responses to items reflect summary assessments based on
repeated exposure to or direct observations of a particular
work group. Four items were taken directly or adapted from
Hackman to assess group membership stability, which
reflects both continuity of membership and frequency of
interaction. Examples included "Do members typically remain
in the same group indefinitely or does membership change
frequently?" and "How often can individuals expect to be in
a group with at least two other people with whom they have
worked in the last six months?" Response formats appeared
as 5-point scales. Responses to these items demonstrated a
high level of association (Pearson r ranged from .79 to .91),
thus we averaged the items to form a single measure of
membership stability (Cronbach's alpha = .80). This suggests
that in our sample, work groups that remained intact longer
tended to interact more often. An additional item was used
to determine the major type of work performed by each
team (e.g., production, service, decision making, problem
solving, or performance).

We measured the prevalence of work groups' mood-regula-
tion norms with an 18-item scale developed by Doherty and
colleagues (Doherty et al., 1995; Doherty, 1997). We used
the Doherty scale as an index of individual susceptibility to
mood convergence, defined as the extent to which a person
is affectively in tune with others, based on tendencies to
notice facial, vocal, and postural expressions and to experi-
ence the moods displayed by others. Although Doherty
devised the scale as an individual difference measure, it
allowed us to assess behaviors consistent with our definition
of mood-regulation norms because it measures the frequen-
cy with which emotional stimuli are noticed and the likelihood
that they elicit emotional expressions characteristic of the
observed emotion (Doherty, 1997: 134). Some items assess
attention to others' emotions, whereas other items describe
emotional responses to another person's emotional experi-
ence or expression.

We adapted the items and instructions to ask how members
typically behave in their work group, rather than how they
generally behave across situations. Examples included "I pay
attention to what others are feeling" and "I notice myself
getting tense when I'm around members who are stressed
out" (see Appendix B for a complete item list). We preserved
"I" as the referent for each item. A common method for
measuring social norms involves asking group members

about their personal reactions to other members' behaviors and then aggregating such responses (Levine and Moreland, 1998). Group members rated the accuracy of each item in describing their individual feelings and behavior in their work group on a 7-point scale (1 = very inaccurate, 7 = very accurate). Doherty has shown that the scale is a reliable measure with high construct validity. Cronbach's alpha for our adapted measure was .88.

Task interdependence partly stems from requirements and constraints inherent in a task's technology or design. It is also a characteristic of the way individuals plan, coordinate, and execute their tasks in relation to other features of the context, such as goals, feedback, rewards, authority, and leadership (Saavedra, Earley, and Van Dyne, 1993; Wageman, 1995). The interdependence of members in a work group is often similar, but it can also vary a great deal. Therefore, we assessed members' "experienced" task interdependence with Pearce and Gregersen's (1991) 8-item scale, which is sensitive to variation in members' task interdependence. Examples included "I frequently must coordinate my efforts with others" and "The way I perform my work has a significant impact on others." Respondents rated on a 7-point scale (1 = very inaccurate, 7 = very accurate) the extent to which each statement was an accurate description of the way they worked with other members. Cronbach's alpha for this measure was .82.

Social interdependence was assessed with a 5-item social cohesion scale developed by Koys and DeCotiis (1991). Work group members indicated on a 7-point scale (1 = strongly disagree, 7 = strongly agree) the extent to which they agreed that each statement described the quality of interpersonal relations among members. Examples included "People take a personal interest in one another" and "There is a lot of 'team spirit' in our work group." Cronbach's alpha was .85.

Self-reported mood. Self-report mood was assessed with the 48 mood adjectives contained in the mood circumplex model. Each of the eight mood categories was measured by six mood adjectives (see figure 1). The validity of the eight-category structure of the circumplex model has been widely demonstrated (Larsen and Diener, 1992; Weiss and Cropanzano, 1996). Cronbach's alpha for each of the eight mood categories ranged from .75 to .91, with a mean alpha of .85. Work group members used a 7-point scale (0 = not at all, 6 = a great deal) to report the extent to which they were currently experiencing each mood adjective. Because work group members completed the survey immediately at the conclusion of their work session, we captured how they felt at the moment, having just completed a period of sustained interaction.

RESULTS

We had several goals for this study. First, we wanted to establish the extent to which mood convergence occurs in work groups (H1) and whether such convergence is indicated across all mood categories in the circumplex model. Second, we wanted to demonstrate that work group moods manifest themselves behaviorally (H2) by comparing observers'

assessments of work group mood with aggregated self-reported values. Third, we wanted to examine the influence of various event-structure properties on mood convergence (H3–H6).

Aggregation of Self-Report Assessments

Work group mood. To ascertain whether self-reported values of mood could be aggregated to the group-level, we used two complementary measures of within-group agreement. The first, the intraclass correlation coefficient (ICC), uses a one-way analysis of variance to ensure that the variance between teams is greater than the variance within teams. ICC coefficients that yield a significant F-test provide empirical support for aggregation (Kenny and LaVoie, 1985). The second measure of within-group agreement, the interrater reliability coefficient (IRR), indicates the proportion of systematic variance in a specific group in relation to the expected variance, reflecting the degree to which work group members converge or agree in their assessments (James, Demaree, and Wolf, 1984). The IRR uses a regular uniform null distribution to estimate within-group agreement. An IRR of zero indicates low convergence among group members; a coefficient of .50 suggests moderate convergence, and coefficients above .70 suggest substantial convergence (James, Demaree, and Wolf, 1984). Together, the ICC and IRR coefficients reveal which variables have greater between-group differences and similar within-group agreement levels (Edmondson, 1996).

Table 1 demonstrates the existence of mood convergence across the eight self-reported mood categories of the mood circumplex model. Each mood category yielded significant ICC values, ranging from .51 to .59 ($p < .001$). The median IRR coefficients ranged from .52 to .76, suggesting moderate to high levels of within-group agreement across mood categories. Although group members tended to become affectively in tune with one another, we did not obtain complete mood convergence. We suspect this is due to variance in how much members express their own moods, their attentiveness to others' moods, and their abilities to decode behavioral cues accurately (Hatfield, Cacioppo, and Rapson, 1994). Nonetheless, our results provide strong support for

Table 1

Intraclass Coefficients, Interrater Reliabilities, and Intercorrelations for Self-reported Work Group Moods*

Self-reported mood	Alpha	ICC	Median IRR	1	2	3	4	5	6	7
1. High activation	.87	.55•••	.62							
2. Activated pleasant	.90	.57•••	.65	.33••						
3. Pleasant	.88	.59•••	.61	.05	.28•					
4. Unactivated pleasant	.81	.58•••	.59	−.03	.23•	.31••				
5. Low activation	.75	.51•••	.52	−.30••	−.16	.12	.15			
6. Unactivated unpleasant	.78	.58•••	.56	−.25•	−.30••	−.21	.05	.26•		
7. Unpleasant	.91	.55•••	.76	−.07	−.05	−.35••	−.02	−.03	.33••	
8. Activated unpleasant	.89	.58•••	.72	.30••	−.02	−.16	−.32••	−.08	.20	.36••

•$p < .05$; ••$p < .01$; •••$p < .001$.
*$N = 70$ work groups (357 work group members). Median IRR values range from .00 to 1.00: .00 = low mood convergence, .50 = moderate mood convergence, .70 = substantial mood convergence.

the conceptualization of mood as a collective property of work groups (H1).

Among the higher IRR coefficients were moods characterized by unpleasantness (unpleasant = .76, activated unpleasant = .72), suggesting that work groups are prone to experience unpleasant moods collectively. Research has shown that negative information and events are highly salient in interpersonal settings, evoking stronger and more rapid physiological, cognitive, emotional, and social responses than neutral or pleasant events (Cacioppo, Gardner, and Berntson, 1997). Hence, behavioral cues indicative of unpleasant mood may command substantial attention, increasing the likelihood of convergence through automatic mimicry and synchrony of behavioral expressions (i.e., contagion). Overall, the results suggest that mood convergence can occur for a broad range of mood categories and is not contingent on specific affective qualities (e.g., pleasantness or unpleasantness, high or low activation).

Event-structure properties. Self-reported measures of mood-regulation norms and task and social interdependence passed the aggregation tests of a significant ICC (.56, .58, and .71, respectively) and acceptable levels of within-group agreement (IRR = .77, .65, and .78, respectively). We created collective scores for each work group property by averaging individual members' scores, which we then used in subsequent analyses.

Generation of Observer Team Ratings

We expected that the behavioral indicators for assessing work group mood would allow for variability in observers' skills and habits. That is, observers differ in their preferences (i.e., facial, vocal, and postural cues) and abilities (i.e., frequency with which cues were reported) for decoding mood. Thus, the generation of an observer-team assessment required that data from different observers be reconciled and that teams reach consensus on the mood information (facial, vocal, and postural) that was collectively salient. Our examination of observer teams' summary reports revealed that individuals did exhibit different observation patterns but that few observer teams experienced any difficulties in generating team assessments for the eight mood categories. Observers' data were generally consistent despite idiosyncrasies in observation techniques. Although some observers detected mostly facial cues whereas others focused on postural cues, the behaviors detected by observers tended to correspond to the same mood categories. Thus, observers detected the same moods using different mood information.

We also examined observer teams' summary reports to determine the strategies that teams used to generate collective ratings. Most observer teams (N = 33, 94 percent) used a similar strategy. First, individuals tallied their frequency counts across the behavioral indicators for each mood category and then either rank-ordered the moods or assigned a value (0 = not at all, 6 = a great deal) to indicate how much of each mood was present in a work group. Observers then compared their individual assessments, reconciled discrepancies, listed the mood categories in terms of prevalence with-

in the work group, and then collectively assigned a value (0 = not at all, 6 = a great deal) to each mood category. This process required that observer teams share information and resolve discrepant data, which probably produced more accurate and reliable assessments of work group mood than if we had collected and aggregated individual observers' data. Overall, observer teams' summary reports indicated that collective ratings were not remarkably different from individual assessments, suggesting adequate interrater reliability, though developing consensus ratings may have helped to filter out the variability in individual assessments and to accentuate shared information.

Correspondence between Self-reported and Observed Mood Ratings

Observers' and self-reported ratings each provide global assessments of eight mood categories based on a common metric (0–6 scale). To determine whether observer teams were able to assess work group moods accurately, we conducted a paired t-test of self-reported and observed ratings for each mood category. Our data met the assumptions for a matched-pairs analysis, given that observers' and self-reported ratings were made under the same conditions and mean differences between observers' and self-reported ratings of each mood category were normally distributed. Table 2 presents the results. Observer teams generated accurate assessments of work group mood for four mood categories: high activation, activated pleasant, unpleasant, and activated unpleasant. We obtained nonsignificant t-values for these moods with correlations between observed and self-report ratings ranging from .68 to .80.

Observer teams generated different ratings of work group mood for the four remaining mood categories: pleasant, unactivated pleasant, low activation, and unactivated unpleasant. As table 2 shows, we obtained moderate correlations for

Table 2

Comparisons of Observed and Self-reported Mood Ratings

Circumplex categories	Observer Mean	Self-report Mean	Pearson r	t-value*
High activation	1.99 (1.83)	1.77 (1.02)	.68**	1.18
Activated pleasant	2.75 (1.93)	2.40 (1.18)	.70**	2.09
Pleasant	3.87 (1.81)	2.98 (1.20)	.42**	4.75**
Unactivated pleasant	3.40 (1.93)	2.69 (1.35)	.50**	3.27*
Low activation	2.76 (1.54)	1.42 (.98)	.48**	7.03**
Unactivated unpleasant	1.96 (1.64)	1.52 (1.02)	.54**	3.03*
Unpleasant	1.32 (1.28)	1.01 (.99)	.76**	1.67
Activated unpleasant	1.65 (1.30)	1.53 (1.17)	.80**	1.04

*$p < .01$; **$p < .001$.
*N = 70 work groups, N = 35 observer teams, d.f. = 69. Standard deviations are in parentheses.

the off-target mood categories ranging from .42 to .54 and statistically significant t-values for observer and self-reported ratings. According to Cohen (1987), correlations between .30 and .49 represent medium effect sizes while correlations equal to or greater than .50 represent large effect sizes. Although observed and self-reported ratings of these moods differed, the correlations demonstrate moderate to high levels of association.

Whereas observer teams overestimated the degree to which the four mood categories were exhibited, both observer teams and work groups rated these moods as most prevalent. It appears that observer teams correctly identified which moods were most characteristic of work group members' experiences but overestimated their presence in the group setting. Although we obtained significant t-values for only four mood categories (pleasant, unactivated pleasant, low activation, and unactivated unpleasant), observed ratings were consistently higher than self-reported ratings for all eight mood categories. It is possible that observer teams overestimated the presence of work group moods because their judgments were based on relative assessments of available mood information. Hence, there was no baseline against which observer teams could weigh the behavioral evidence collected for each mood category.

To test whether observer teams could detect accurately which work group moods were present, independent of how much each mood was present, we transformed the original observer and self-reported ratings to ranks and then used Spearman correlations to assess their relationship. Overall, Spearman correlations ranged from .66 to .82, suggesting that observers' rankings were notably accurate compared with self-reported rankings of the mood circumplex categories. For the four mood categories that yielded significant t-values, Spearman correlations indicated considerable consistency in observer and self-reported rankings: pleasant = .66, unactivated pleasant = .70, low activation = .69, and unactivated unpleasant = .71. Combined with the results reported in table 2, our findings suggest that observer teams were successful in discerning and interpreting behavioral evidence of work group moods. On the whole, these results provide support for hypothesis 2. The pattern of results also suggests that the observer's instrument, rather than requiring extensive and singular training, builds on observers' natural abilities to decode mood information. In this respect, the instrument provides a more conservative test of the perceptibility of mood information in work groups than if we had used a rigorous training protocol.

Evaluation of the Observer's Instrument for Work Group Mood

We examined individual observers' data to determine the usefulness of facial, vocal, and postural indicators for evaluating work group moods. For each observer ($N = 105$), we tallied the frequency counts for the facial, vocal, and postural indicators for the eight mood categories. Table 3 shows that observers used multiple indicators as mood information, suggesting that work group members can share their moods

Table 3

Means and Standard Deviations for Frequency of Anchor Use for the Observer's Instrument for Work Group Mood*

Mood Categories	Frequency of Anchor Use		
	Facial	Vocal	Postural
High activation	9.53	8.91	10.87
	(7.30)	(7.20)	(4.66)
Activated pleasant	18.12	9.52	15.98
	(9.52)	(11.79)	(11.80)
Pleasant	20.63	10.67	12.70
	(6.79)	(18.00)	(7.55)
Unactivated pleasant	18.21	13.98	15.74
	(2.01)	(5.17)	(4.12)
Low activation	9.68	3.69	5.67
	(4.20)	(3.55)	(2.80)
Unactivated unpleasant	2.66	1.96	4.59
	(3.28)	(2.93)	(4.36)
Unpleasant	4.96	1.01	3.30
	(3.14)	(2.08)	(3.75)
Activated unpleasant	3.32	1.81	5.00
	(5.95)	(5.56)	(5.57)
Total:	15.51	8.61	12.31
	(6.45)	(8.21)	(6.74)

*N = 105 observers. Standard deviations are in parentheses.

with others through different channels of expression. Overall, the data suggest that facial expressions were used most frequently, followed by postural movements, and then vocalizations. This is consistent with observer teams' summary reports indicating that facial indicators were the easiest to detect. Psychological research on emotion suggests that overt facial movements are perhaps the most fundamental form of emotional expression and that individuals generally are able to track subtle moment-to-moment changes in facial gestures (Hsee, Hatfield, and Chemtob, 1991). Evolutionary views of language (Corballis, 1999) also suggest that gestural communication (facial and postural expressions) was more adaptive in primitive environments than vocal communication. Gestures are silent, reducing the risk of alerting others to one's presence, as well as spatial, which is better suited to indicating the whereabouts of others. Consequently, humans have developed an innate capacity to communicate by gesture.

Vocal cues may be less useful for evaluating group mood because members can only display such cues when it is their turn to speak. Interaction patterns resulting from a work group's authority structure, role assignments, and task strategies may limit individual members' speaking time and the extent to which they can express mood information with vocal cues. Also, emotional outbursts are often discouraged in organizational settings (Ashforth and Humphrey, 1995), thus group members may refrain from expressing certain moods through vocal cues. Vocalizing activated pleasant and activated unpleasant moods may be particularly inappropriate (e.g., loud volume, rapid pace, high pitch, shortness of breath), leading members to select alternative channels through which to express their feelings. Such factors, coupled with natural abilities to detect, interpret, and mimic ges-

tures, suggest that facial and postural behaviors surpass verbal cues as useful mood information in work group settings.

Table 3 also shows that observers generated the highest frequency counts for high activation, activated pleasant, pleasant, and unactivated pleasant mood. This implies that individual observers saw more behavioral evidence of these moods than of the other mood categories. Self-reported data in table 2 show that work groups experienced these four moods to a greater extent than other moods. Thus, individual observers' data map perfectly onto work groups' self-reported data. These data reinforce our argument that observers can detect work group moods using behavioral cues and also demonstrate the utility of the observer's instrument for assessing such moods in natural contexts.

Impact of Event-structure Properties on Mood Convergence

The interrater reliability (IRR) coefficient represents the level of within-group agreement and, thus, reflects the degree to which group members' responses are interchangeable (James, Demaree, and Wolf, 1984). Accordingly, we used work groups' IRR coefficients as measures of mood convergence for the eight self-reported mood categories in subsequent analyses. Hypotheses 3–6 represent the predicted effects of event-structure properties (membership stability, mood-regulation norms, and task and social interdependence) on mood convergence. Although we did not expect mood convergence to differ systematically as a function of task type (i.e., production, service, decision making, problem solving, and performance), we tested for this possibility before proceeding with any analyses. A multivariate analysis of variance (MANOVA) revealed no univariate or multivariate effects (Pillai's $F = 1.68$, $p > .05$), thus we did not control for task type in subsequent analyses. The finding that mood convergence does not vary by task type implies that work groups performing a wide variety of tasks can develop collective moods, though it is premature to suggest that mood convergence is not contingent on the type of tasks performed by work groups. The task categories we used are fairly broad (e.g., service, decision making) and contain substantial variance in terms of the activities required by work groups. Using the service category as an example, it is reasonable to suspect that flight attendants, surgical nurses, and lawyers perform a different array of tasks. Thus, the task categories do not dictate patterns of interaction in work groups. Nonetheless, the finding that mood convergence did not vary as a function of these broad task categories implies that affective coordination may be a fundamental aspect of working in a social system and has implications for a broad array of work groups.

Table 4 presents means, standard deviations, and zero-order correlations for event-structure properties and mood convergence. Overall, mood convergence for each mood category was positively and significantly associated with membership stability, task interdependence, and social interdependence, providing initial support for hypotheses 3, 5, and 6, respectively. Mood-regulation norms were significantly related to

Table 4

Intercorrelations for Event-structure Properties and Mood Convergence*

	Mean	S.D.	1	2	3	4	5
1. IRR high activation	.63	.25					
2. IRR activated pleasant	.60	.20	.58••				
3. IRR pleasant	.62	.26	.51••	.52••			
4. IRR unactivated pleasant	.58	.27	.45••	.45••	.52••		
5. IRR low activation	.55	.29	.32•	.34•	.67••	.46••	
6. IRR unactivated unpleasant	.57	.25	.44••	.50••	.50••	.40••	.50••
7. IRR unpleasant	.70	.28	.40••	.30•	.36•	.35•	.30•
8. IRR activated unpleasant	.64	.31	.46••	.36•	.38•	.34•	.31•
9. Membership stability	3.70	1.00	.41••	.37••	.50••	.54••	.47••
10. Mood-regulation norms	4.71	1.30	.34•	.40••	.32•	.22	.18
11. Task interdependence	4.91	1.15	.57••	.52••	.50••	.48••	.42••
12. Social interdependence	5.18	1.02	.50••	.48••	.45••	.41••	.35•

	6	7	8	9	10	11	
7. IRR unpleasant	.43••						
8. IRR activated unpleasant	.48••	.66••					
9. Membership stability	.44••	.45••	.38•				
10. Mood-regulation norms	.26	.30•	.41••	.17			
11. Task interdependence	.48••	.45••	.55••	.30•	.34•		
12. Social interdependence	.44••	.38•	.45••	.28•	.25•	.37•	

•$p < .01$; ••$p < .001$.
*$N = 70$ work groups, IRR values range from .00 to 1.00. Task and social interdependence and prevalence of mood-regulation norms are self-reported. Membership stability is supervisor-reported.

mood convergence for five out of the eight mood categories: high activation, activated pleasant, pleasant, unpleasant, and activated unpleasant. Mood-regulation norms were not significantly associated with low arousal mood categories: unactivated pleasant, low activation, and unactivated unpleasant. Although these results offer only partial support for hypothesis 4, they do suggest that mood-regulation norms are generally associated with mood convergence in work groups.

We used hierarchical regression analyses to assess the independent contributions of work group stability and mood-regulation norms and task and social interdependence to mood convergence. First, we entered the group design variables that reflect relatively stable event-structure properties and then we added the dynamic interdependence variables. Table 5 presents these results. Collectively, this constellation of work group factors explained a substantial proportion of the variance in mood convergence, with adjusted R^2 values ranging from .27 to .41.

Overall, membership stability and task and social interdependence were significant predictors of mood convergence for the eight mood categories, supporting hypotheses 3, 5, and 6, but mood-regulation norms predicted mood convergence for only three mood categories: high activation, activated pleasant, and activated unpleasant. Thus, we found partial support for hypothesis 4. These results suggest that group membership stability and task and social interdependence operate in similar ways to shape convergence for moods that vary on both hedonic tone and activation. The presence of norms for mood expressions, however, may influence mood convergence only for high-energy moods that are either pleasantly or unpleasantly charged.

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Table 5

Hierarchical Regression Analyses for Event-structure Properties and Mood Convergence*

Dependent Variables	Step 1				Step 2				Overall F	Adjusted R²
	Membership stability	Mood-regulation norms	ΔR²	ΔF	Task interdep.	Social interdep.	ΔR²	ΔF		
IRR: high activation	.29* (.02)	.17* (.03)	.30	18.83***	.30*** (.01)	.28*** (.02)	.15	11.97***	18.49***	.41
IRR: activated pleasant	.21* (.02)	.27** (.03)	.28	16.04***	.29** (.03)	.24* (.02)	.14	8.01***	13.62***	.38
IRR: pleasant	.34*** (.02)	.11 (.03)	.22	17.52***	.32** (.03)	.22* (.02)	.16	8.83***	15.23***	.35
IRR: unactivated pleasant	.29** (.02)	.14 (.02)	.23	14.44***	.34** (.03)	.24* (.02)	.17	10.22***	14.32***	.36
IRR: low activation	.30** (.03)	.10 (.03)	.18	8.25***	.29** (.04)	.22* (.03)	.12	5.12**	9.25***	.27
IRR: unactivated unpleasant	.25* (.02)	.11 (.03)	.21	11.58***	.25* (.03)	.28** (.03)	.14	7.42***	10.77***	.31
IRR: unpleasant	.27** (.02)	.09 (.02)	.22	10.09***	.29** (.02)	.26* (.03)	.16	8.77***	10.49***	.34
IRR: activated unpleasant	.22* (.02)	.25** (.03)	.28	16.41***	.32** (.02)	.25** (.03)	.17	9.67***	15.16***	.41

*$p < .05$; **$p < .01$; ***$p < .001$.
*$N = 70$ work groups. Standardized betas are from final step in the regression equation. Standard errors are in parentheses.

DISCUSSION

We argued that if mood converges in work groups, it should be observable to both individual members and observers. Our results suggest that some mood categories may provide more accurate windows for observers than others. Moods characterized by high arousal (activated unpleasant, high activation, and activated pleasant) yielded more accurate observer assessments, possibly because behavioral cues signaling these moods are more salient in a group context. As shown in Appendix A, the facial, vocal, and postural cues for these moods involve more exaggerated movements, such as a rapid vocal pace, hearty laughter, and frequent smiling (activated pleasant), or clenched teeth, a flushed face, and closed fists (activated unpleasant). Observers may be able to decode such behavioral cues more accurately than the facial, postural, and vocal expressions associated with low energy mood states. For the three mood categories characterized by low arousal (unactivated pleasant, low activation, and unactivated pleasant), observer teams were less accurate in judging the degree to which these moods were present in work groups when their ratings were compared with self-reported ratings. Further, these mood categories yielded the lowest levels of mood convergence in aggregated self-reported ratings. This pattern of results suggests that work group members are less attuned to low-energy moods, perhaps because they involve more subtle and constrained behavioral expressions than other mood states. It also begins to answer the question raised by Barsade (1998) about whether certain moods are more likely to spread among members of a work group. Our results are consistent with Barsade's prediction that affective convergence in work groups is more likely to occur for high-energy (e.g., cheerful enthusiasm, hostile irritability) than for low-energy emotions (e.g., serene warmth, depressed sluggishness).

Overall, our results provide evidence that mood information can be communicated to others via facial, vocal, and postural cues and that behavioral data may be used as accurate approximations of work group moods. Our results provide initial support for the idea that the collective construction of work group mood may result from observable behavioral cues in the group. In this regard, our research serves as an important building block for understanding how work group mood develops and for identifying possible methods for studying it. We infer that mood convergence ensues from the dual processes of emotional contagion and emotional comparison, both of which require behavioral information. An alternative argument is that task or situational factors set the tone for our observed work sessions. For example, if a product development team was facing a crisis, then we may have expected to see evidence of activated-unpleasant mood among members, perhaps even before they convened as a group. Although conditions outside a work group can initiate a common social-emotional experience for members, it is unlikely that this would enable them to share the same feelings to a similar degree for each category of the mood circumplex model. The finding that work groups had at least moderate mood convergence for the eight mood categories suggests that other mood-coordination mechanisms are in

play as work groups perform their tasks. Individual variation in hedonic valence (pleasantness-unpleasantness) and activation that exist when group members convene as a group become synchronized in the course of working together. Comparison and contagion processes are central to affective coordination, but future research should examine these processes directly in work groups.

The observer's instrument that we developed enabled us to investigate empirically the concept of work group mood. Observers' and self-reported ratings of mood on this instrument indicated that work groups can experience a more diverse range of collective moods than past research would suggest. Our research also represents a first attempt to show that observers can use behavioral cues to assess, with considerable accuracy, the collective mood of work group members. The instrument should be a valuable measurement device in other research contexts as well. It provides an unobtrusive alternative to self-reported measures of mood that is compatible with both field and laboratory investigations and should be most useful in future inquiries of the origins and consequences of work group mood. For example, future work could use the observer's instrument to explore how members build on and shape each other's moods. Observers can trace how both influential (i.e., leaders, high-status members) and behaviorally expressive group members can sway the collective group mood as well as assess the proportion of group members that is needed to tip the collective mood in a certain affective direction (Barsade and Gibson, 1998).

Research on emotional labor can also use the observer's instrument to assess service workers' attentiveness to formal organizational display rules. Researchers can compare observer's data with self-reported data to determine the degree of emotive dissonance (i.e., discrepancy between felt and displayed emotions) experienced by service providers and its connection to emotional exhaustion and job satisfaction (Sutton, 1991; Morris and Feldman, 1996). Further, given that mood research often relies on self-report data (Larsen and Diener, 1992), an important advantage of observational data is that they help to reduce the problem of common-source bias that can threaten the integrity of statistical findings.

Observer teams used their individual assessments (frequency counts) to generate consensus ratings of work group mood, thus, we have no data to test the interrater reliability of observers. Because of variation in observers' skills and habits, combined with the difficulty of coding group behavior in real time (e.g., viewing angle of observer, number of observation targets, speed of target behavior), we reasoned that observer teams would generate more accurate and reliable assessments by focusing on shared information. Although groups tend to provide more accurate judgments than individuals (Hinsz, Tindale, and Vollrath, 1997), it is premature to conclude that individual observers would be less accurate in estimating work group mood. When work group behavior is captured on videotape and can be viewed multiple times, researchers could use a single observer to conduct a behavioral assessment with the observer's instrument and

complete an overall rating of how much each mood was present or aggregate multiple observers' data. Researchers could spend time training observers to be well versed in using multiple behavioral indicators to infer mood. Such applications would require researchers to perform additional reliability tests to determine the consistency in observers' overall ratings of the eight mood circumplex categories. Such efforts would provide further validation of the observer's instrument as well as extend its practical utility.

Event Structures Promoting Mood Convergence

Multiple forces operate on work groups to influence the degree to which members develop mutually shared moods. Our research represents a first attempt to identify empirically event structures that affect mood convergence among members. Work groups that had frequent and continued contact and construed themselves as strongly interconnected on both a task and social basis were especially prone to mood convergence. The prevalence of mood-regulation norms had differential effects on mood convergence for the circumplex mood categories. We found that mood-regulation norms are strongly associated with mood convergence for high-energy mood states (high activation, activated pleasant, activated unpleasant).

Although the presence of mood-regulation norms in work groups can only be inferred given the measure we used (e.g., Doherty, 1997), our interpretation of the results is that mood-regulation norms are associated with high-energy moods possibly because they are a more central feature of task interactions than low-energy moods. Group activity requires coordination, which itself requires energy regulation. A group may be enthusiastic or it may be fatigued; a group may be nervous or it may be relaxed. Weiss and Cropanzano (1996) argued that the level of energy or arousal of a mood state is usually elevated for important events and flat for unimportant events. High-arousal mood states tend to signal changing circumstances in the environment and stimulate a search to interpret those changes. Accordingly, such moods motivate action toward achieving a particular set of outcomes and, thus, are often experienced for events with meaningful consequences. For work groups, events that are closely tied to the task require extensive coordination (Hackman, 1992) and, thus, energy regulation, which may be better served by high arousal than low-arousal mood states. High-arousal group moods may be adaptive for work groups because they motivate collective action toward goal attainment. For events not central to the task, members may be less emotionally invested, and normative control should be low.

Accordingly, we would expect more synchronous control for activated moods through group norms, given that intensity levels are higher than for unactivated moods (Larsen and Diener, 1992). Although work groups experienced a full range of moods, they may develop tendencies to regulate behavioral expressions of activated mood, perhaps because these are linked to important task activities. This argument is consistent with the finding that group members' attentiveness and responsiveness to observable mood information

(i.e., mood-regulation norms) were more strongly associated with mood convergence for high-energy than low-energy mood states. This may partly explain why work groups' self-reported data demonstrated less convergence for low-energy moods than high-energy moods. We noted previously that behavioral cues signaling low-energy moods might not be particularly salient, reducing the degree to which members detect and respond to such moods, but it is also possible that low-energy moods have a limited instrumental value during task interactions and tend not to be regulated by members. Our data were collected after a sustained collective work session, thus we did not examine non-performing episodes in groups' work cycles (i.e., downtime). Gersick (1988) suggested that work groups oscillate between periods of coordination and member autonomy in executing their work, thus it is possible that low-energy moods and norms pertaining to such moods have greater relevance during periods of increased task independence and social interaction. Additional research is needed to explore possible differences in work group moods that members regulate during task and social exchanges.

Because the present study was correlational and did not involve the manipulation of variables, causality cannot be inferred for relationships between event structures and mood convergence. It is unlikely, however, that mood convergence causes membership stability (i.e., membership is usually assigned by management) or normative power (i.e., it is a relatively stable developmental feature of work groups). But because mood convergence serves an important social integration function (Hatfield, Cacioppo, and Rapson, 1994), it is possible that high levels of mood convergence lead members to construe themselves as more interrelated on both a task and a social basis. Although this is more likely for pleasant than unpleasant group moods, we recommend future research to explore how mood convergence for various circumplex categories influences these relational group factors. Longitudinal designs in which the complex interplay of these factors is monitored over time should prove particularly insightful.

In this study, we presented an initial mapping of the event structures that influence work group mood, thus it is unlikely that all relevant constructs were included. For example, Manstead (1991) argued that despite substantial evidence indicating the universality of meaning of certain facial expressions (Ekman and Keltner, 1997), the expression and experience of affect in social situations are subject to cultural, ethnic, and socioeconomic influences. For example, individuals are more expressive in cultures that value emotional displays as an opportunity for self-expression or as useful social communication than in cultures that view such displays as weak and immature or as disruptive to social interaction. Work groups with members who tend to be emotionally unexpressive are unlikely to exhibit their moods behaviorally, thus attenuating the possibility of mood convergence. Other relevant individual differences that shape affective expressiveness include gender (Hall, 1984), age (Malatesta and Izard,

1984), and affective disposition or proclivity to feel certain moods (George, 1990).

Demographic factors have important implications for work group moods. Members of diverse work groups may find it difficult to identify and interpret behavioral mood information displayed by dissimilar others, thereby reducing mood convergence. Research could investigate patterns of mood convergence in work groups operating in different cultural contexts as well as in work groups with diverse demographic compositions. Such efforts would extend our research by further elaborating the conditions that shape the collective construction of work group moods. Another important avenue for future research is to focus on the function of collective moods in work groups. Research at the individual level has shown that mood states affect task motivation, information processing, and social behavior, producing varied effects on analytical reasoning, problem solving, decision making, and creativity (Isen and Baron, 1991; Staw and Barsade, 1993; Staw, Sutton, and Pelled, 1994). It is possible that collective moods have important implications for work groups performing organizational tasks. Connections between work group moods and group performance outcomes have not yet been well established. George (1990, 1995) and Barsade (1998) have pioneered work in this area, reporting that collective moods influence absenteeism, cooperation, and conflict in ways similar to individuals.

It is also possible, however, that the influence of collective mood on group behavior may follow pathways that differ from the effects on individuals. For example, Forgas (1992) noted a mood-congruence effect in that individual judgments were positive in a pleasant mood and negative in an unpleasant mood. In a pleasant mood, however, individuals who participated in group discussions made more positive choices than they did alone, consistent with research on group extremity shifts. But such polarization in choice was not always observed for unpleasant mood, sometimes even resulting in noncongruent effects (e.g., group members in unpleasant moods shift to a more positive judgment). Although Forgas did not assess work group moods directly, he speculated that normative and informational influence processes in groups may serve to moderate mood-behavior linkages. These influence processes may be powerful enough to generate uncharted consequences for work group mood, yielding behavioral patterns that differ from those of individuals. Continued theory development on work group mood would benefit from investigations of how collective moods modify performance outcomes through their effects on intermediary processes (i.e., framing, information processing) as well as how such effects are intensified, attenuated, or inverted by social influences.

Barsade and Gibson (1998: 98) recently noted that "a certainty in the mystery of managing effective work groups is that groups are emotional." Our study speaks directly to this aspect of group life. We tackled three key issues in our research: establishing the range of shared mood states that work groups experience, specifying conditions under which work group mood develops, and creating an instrument for

assessing work group mood. Our findings suggest that work groups can share fully differentiated affective experiences and that the degree of mood convergence is related to event structures that shape how members interrelate. Managers need to consider that moods can be an especially powerful force in highly interdependent work groups with stable membership. Such groups constitute arenas in which mood may orient and direct groups toward collective action. Managers can potentially accelerate or attenuate the emergence of collective moods by altering characteristics of a group's work, elements of a group's context, or aspects of a group's composition which, in turn, alter members' interaction patterns and the degree to which members can distribute and acquire behavioral mood information. But it is premature to offer managerial suggestions without additional research that documents the processes underlying mood convergence as well as the impact of various work group moods on performance. Efforts to tease out how and when certain work group moods enhance or undermine task performance would be especially valuable. Such research will not only improve understanding of mood as a collective phenomenon but also may ultimately bring us closer to uncovering the mystery of managing effective work groups.

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APPENDIX A: Observer's Instrument for Work Group Mood*

High activation

F: a lot of eye contact	V: rapid pace	P: poised for action
F: open mouth	V: varied inflection	P: startled
F: arched eyebrows	V: incredulous tone	P: restless

Activated pleasant

F: smile with teeth showing	V: hard laughter	P: exaggerated hand gestures
F: arched eyebrows	V: high pitch	P: leaning forward
F: a lot of eye contact	V: rapid pace	P: constant body movement
	V: loud volume	P: orienting toward group members
	V: slightly breathless	P: more physical contact
	V: talking a lot	
	V: animated intonation (rhythmic pattern)	

Pleasant

F: slightly raised eyebrows	V: varied inflection	P: hands are active during speech
F: closed lip smile (grin)	V: regular pace	P: head tilted toward stimuli
F: eyes scan stimuli	V: clearly audible volume	P: body poised to include group members

Unactivated pleasant

F: mouth may be turned slightly upwards	V: soft but audible volume	P: relaxed but engaged orientation toward group members
F: little facial movement	V: some inflection in tone or pitch	P: little movement in limbs or torso
	V: regular pace	

Low activation

F: expressionless	V: whispering volume	P: slow movements
F: little eye contact	V: monotone	P: reclined position
F: closed mouth	V: slow pace	P: immobile
	V: delayed responses	
	V: infrequent speech	

Work Group Moods

Unactivated unpleasant

F: excessive blinking	V: monotone	P: slouching
F: droopy eyes (partial- ly closed)	V: few vocalizations	P: orienting away from group (withdrawn)
F: yawning	V: mumbling	P: motionless
F: fixed stare away from group mem- bers	V: low volume	P: leaning chin on hand
F: almost no eye con- tact	V: low pitch	P: hands inactive dur- ing speech
	V: delayed responses	P: rubbing eyes
		P: shying away from stimuli
		P: no physical contact

Unpleasant

F: frown	V: soft volume	P: head tilted down- ward
F: eyes avoid stimuli	V: slow pace	P: resting head on hands
F: blank stare	V: monotone	P: body poised to exclude group members

Activated unpleasant

F: eyebrows lowered, chin raised, mouth closed	V: stuttering	P: closed fists
F: sporadic eye con- tact	V: rapid speech	P: hand tremors
F: sneering	V: short of breath	P: poised for action
F: flushed face	V: uneven pitch (voice "cracks")	P: nervous habits (rocking, chewing fingernails)
F: "nervous smile"	V: uneven volume	
F: clenched teeth		

*F = facial indicators; V = vocal indicators; P = postural indicators.

APPENDIX B: Measure of Mood-Regulation Norms

Adapted from Doherty (1997)

Seven-point scale: 1 (very inaccurate) to 7 (very accurate)

I clench my jaws and my shoulders get tight when I'm around angry group members.

When I'm around angry group members, I get angry myself.

I tense up when overhearing members have heated arguments.

I notice myself getting tense when I'm around members who are stressed out.

Listening to the agitated voices of worried group members makes me feel nervous.

Seeing the anxious faces of group members makes me try to imagine how they might be feeling.

Being with happy group members picks me up when I'm feeling down.

When a member smiles warmly at me, I smile back and feel happy inside.

Being around happy group members makes me feel cheerful and upbeat.

I find it hard to remain calm when other group members are excited.

When someone laughs hard, I laugh too.

I sense my body responding when I'm around energetic members.

I feel sluggish when talking to a depressed group member.

I become unhappy when I'm around group members who are depressed.

It bothers me to be around other group members when they're feeling down.

I pay attention to what others are feeling.

I'm very accurate in judging other members' feelings.

I'm very sensitive in picking up other members' feelings.