Emotion, Social Function, and Psychopathology

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The studies of emotion function and emotional disorders complement one another. In this article, the authors outline relations between the social functions of emotion and four psychological disorders. The authors first present a social-functional account of emotion and argue that emotions help coordinate social interactions through their informative, evocative, and incentive functions. They then review evidence concerning the emotional and social problems related to depression, schizophrenia, social anxiety, and borderline personality disorder and consider how the emotional disturbances related to these disorders disrupt interactions and relationships, thus contributing further to the maintenance of the disorder. They conclude by discussing research strategies relevant to the study of emotion, social interaction, and psychopathology.

We can be afraid . . . or get angry, or feel pity, in general have pleasure or pain, both too much and too little, and in both ways not well; but [having these feelings] at the right times, about the right things, towards the right people, for the right end, and in the right way, is the intermediate and best condition, and proper to virtue. . . . Virtue, then, is a mean.

—Aristotle, *Nicomachaen Ethics*

The notion that many forms of psychopathology include emotional disturbances dates back to the classical philosophers, as is evident in Aristotle's definition of virtue as a mean in emotional response. Recent empirical research lends credence to this general proposition. Different psychological disorders have been linked to "excesses" in emotion (e.g., depression, anxiety), "deficits" in emotion (e.g., depression, psychopathy), or the lack of coherence among emotional response systems (e.g., schizophrenia; Barlow, 1988, 1991; Clark & Watson, 1991; Kring & Bachorowski, in press; Lazarus, 1991; Plutchik, 1993; Thoits, 1985, 1990).

These connections between psychopathology and emotion provide impetus for at least two related lines of inquiry. A first approach is to rely on what is known about the linkages between emotion and autonomic and central nervous system structures (e.g., Davidson, 1993; LeDoux, 1996) as a guide in the discovery of physiological mechanisms that contribute to psychopathology. A second approach is to look outward at the individual's social environment and, guided by what is known about the social functions of emotion, to document how emotional features of psychological disorders relate to specific styles of interaction and relationships, thus perpetuating the disorder. Our aim in this article is to provide a conceptualization and research agenda for this second approach to the study of emotion and psychopathology.

The benefits of studying the relations between the social functions of emotion and psychopathology are twofold. First, given the prevalent association between emotion disturbance and psychopathology (e.g., Thoits, 1985), basic research on emotion and social interaction provides a conceptual framework for considering possible causes and consequences of emotional disturbances as well as potential interventions. For example, many emotion researchers assume that emotions involve multiple components, including behavior, communication, experience, and physiology, and find that these components are often coordinated (e.g., Levenson, 1992). Moreover, the coordinated engagement of these components is important for a

number of emotion-based social interactions. Interpreted within this framework, evidence that the emotional responses of schizophrenic patients are not coordinated (e.g., Kring & Neale, 1996) allows us to make more specific predictions about a number of social and interpersonal consequences. Similarly, other basic emotion research has found that the experience of anger is linked to perceptions of unfairness (Keltner, Ellsworth, & Edwards, 1993) and that the expression of anger evokes fear in others (Dimberg & Ohman, 1996) and communicates dominance and hostility (Knutson, 1996). These findings illuminate how the anger that figures so prominently in borderline personality disorder might be linked to troubled social interactions and relationships.

Just as important, research on the emotional features in psychopathology informs the study of the functions of emotion (Keltner & Gross, in press), much as the study of brain dysfunction informs studies on the functions of brain regions and systems. Indeed, studying the social consequences of emotional disturbances can elucidate how emotions contribute to adaptive social interactions and relationships. For example, children who display little embarrassment in the context of making mistakes tend more generally to behave in antisocial ways (e.g., Keltner, Moffitt, & Stouthamer-Loeber, 1995). This finding is consistent with the notion that one function of embarrassment is to motivate the adherence to social norms and morals (Miller & Leary, 1992).

To make connections between emotion, social functioning, and psychopathology, we first review theoretical and empirical evidence that shows how emotions help coordinate interactions related to the formation and maintenance of social relationships. We then integrate evidence relating four disorders to disturbances in emotional processing and social interaction and then discuss how these disturbances preclude and harm important social relationships. We conclude by discussing possible research strategies relevant to the study of emotion, social interaction, and psychopathology.

A Social Functional Account of Emotion

Initial theoretical and empirical interests in emotion tended to center on the intrapersonal characteristics of emotion, addressing such questions as the determinants of emotional experience, the patterns of emotion-specific physiology, and the coordination of emotional responses. Advances in the understanding of the intrapersonal characteristics of emotions have facilitated the complementary study of the interpersonal functions of emotions. Relevant research and theory has begun to address the consequences of emotion beyond the individual and focus on the ways that emotions are embedded within ongoing social interactions (e.g., Averill, 1980, 1982; Campos, Campos, & Barrett, 1989; Ekman, 1992; Lazarus, 1991; Lutz & Abu-Lughod, 1990).

This new emphasis on the interpersonal characteristics of emotion can be summarized in a social-functional approach to emotion. This approach conceptualizes emotions as multichannel responses that enable the individual to respond adaptively to social problems and take advantage of social opportunities in the context of ongoing interactions (e.g., Campos et al., 1989; Ekman, 1992; Frijda & Mesquita, 1994; Tooby & Cosmides, 1990). Four assumptions are central to a social-functional approach to emotion (Keltner & Haidt, 1997). First, it is assumed that humans are social by nature and meet many of the problems of survival in social relationships (Baumeister & Leary, 1995; Fiske, 1992). Humans respond to threats, generate and distribute resources, and raise offspring in the context of social relationships.

Second, it is assumed that emotions are adaptations or solutions to specific problems related to the formation and maintenance of social relationships (Averill, 1992; Barrett & Campos, 1987; Lutz & White, 1986; Tooby & Cosmides, 1990). As Campos et al. (1989) proposed, "Emotions are not mere feelings, but rather are processes of establishing, maintaining, or disrupting relations between the person and the internal or external environment, when such relations are significant to the individual" (p. 395, 1989). Certain emotions (e.g., anxiety, love, desire, and gratitude) and emotional dispositions (e.g., positive affectivity) motivate individual and interactive behaviors that enable individuals to form social bonds (e.g., Bowlby, 1969; Buss, 1992; Hazan & Shaver, 1987; Trivers, 1971; Watson, 1988; Watson, Clark, McIntyre, & Hamaker, 1992). Other emotions, such as sympathy, anger, jealousy, amusement, and embarrassment, are believed to enable

individuals to maintain, protect, and restore social bonds in the face of immediate threats to the individual or relationship (Averill, 1982; Eisenberg et al., 1989; Keltner & Buswell, 1997; Solomon, 1990).

Third, it is assumed that emotions are dynamic, relational processes that coordinate the actions of individuals in ways that guide their interactions toward more preferred conditions (Campos et al., 1989; Lazarus, 1991). Thus, not only do emotions organize physiological, behavioral, experiential, and cognitive responses within the individual (e.g., Levenson, 1992), they also organize the actions of individuals in face-to-face interactions (e.g., Klinnert, Campos, Sorce, Emde, & Svejda, 1983; Ohman, 1986).

Fourth, a social-functional account presupposes that the experience and expression of emotions bring about beneficial social consequences for individuals and their relationships (e.g., Barrett & Campos, 1987; Baumeister, Stillwell, & Heatherton, 1994; Frijda, 1986; Keltner & Gross, in press). For instance, embarrassment evokes forgiveness in others and produces reconciliation following social transgressions (Keltner & Buswell, 1997). Sadness and distress elicit sympathy, helping, and increased proximity (Campos et al., 1989; Eisenberg et al., 1989). Laughter and smiling evoke affiliative tendencies (Keltner & Bonanno, 1997). The experience and expression of emotions are also associated with more cumulative, long-term social benefits. For example, amusement has been linked to more satisfying personal relations (for review, see Keltner & Bonanno, 1997), and jealousy correlates with the increased likelihood of maintaining long-term intimate relations (Buss, 1992).

Emotion and the Coordination of Social Interaction

A social-functional approach proposes that emotions coordinate social interactions in ways that help humans form and maintain beneficial relationships. Several theorists have offered different arguments about the role of emotions in social relationships. For example, certain theorists have characterized how emotions follow from systematic changes in social relationships (de Rivera & Grinkis, 1986). Other theorists have portrayed emotions as social roles

in which individuals carry out scripted behavior (Averill, 1980; Clark, 1990). Finally, a number of theorists have argued that emotions are elements in extensive social interactions, such as courtship, flirtation, grieving, or play, that help humans meet important social goals (Eibl-Eiblsfeldt, 1989; Ekman, 1984; Lutz, 1988; White, 1990).

Notwithstanding such theorizing, there has been little integration of the research that has examined the specific processes by which emotions coordinate social interactions. In the ensuing section we summarize research that reveals three general processes by which emotions shape social interactions. First, the expression and experience of emotion signal socially relevant information to individuals in interactions about their own and their interaction partners' emotions, intentions, and orientations to the relationship. Second, emotions evoke emotional responses in others that are associated with beneficial responses to the emotional event. Third, emotions serve as incentives for others' actions, thus helping to structure interpersonal interactions. Disturbances in these emotion-based processes will contribute to the breakdown of social interactions, which will then directly impact social and personal adjustment.

Informative Functions of Emotion

At least since Darwin's (1872) analysis of facial expression, researchers have focused on the informative functions of emotional expression, initially studying how facial displays of emotion communicate information about the sender's emotion to receivers in a fairly reliable fashion across cultures (e.g., Ekman, 1993; Izard, 1977; but see Russell, 1994). More recently, researchers have documented that facial, vocal, and verbal expressions of emotion communicate other kinds of social information in addition to the sender's current emotion, including information about the status of ongoing relations (e.g., Knutson, 1996), individuals' social intentions and relational orientations (e.g., Fridlund, 1991, 1992), and significant objects or events in the environment (e.g., Mandler, 1975).

Emotional expression conveys information about senders. Social interactions depend in part on the knowledge of others' intentions and emotions. The expression of emotion provides

at least four kinds of information about others' internal states and dispositions, which in turn helps coordinate social interactions. First, facial and vocal expressions of emotion more or less reliably signal the sender's emotional state to receivers (Ekman, 1993; Scherer, 1986). Second, theorists have speculated that emotional displays communicate the sender's social intentions, such as, for example, whether to strike or flee, offer comfort or play (e.g., Fridlund, 1992). Third, the verbal and nonverbal expression of emotion signals characteristics of the sender and receiver's relationship, including the extent to which it is defined by dominance and affiliation. For example, displays of anger communicate the sender's relative dominance and hostility towards the receiver (Knutson, 1996), whereas displays of embarrassment communicate the sender's relative submissiveness and inclination to affiliate (Keltner, 1995). Fourth, in certain contexts the expression of emotion can signal information about the sender's mental and physical health. For example, in one study, bereaved individuals' displays of anger and disgust led observers to infer that the individuals were suffering from poor psychological adjustment and were in need of psychological assistance (Keltner & Bonanno, 1997). In addition, infants born in distress cry in a characteristic way defined by a long latency, high pitch, and unusually long duration, which signals the infants' physical problems to observers (Zeskind & Lester, 1978).

Emotional expression conveys information about objects and events in the social environment. Many social interactions revolve around individuals' coordinated responses to events in the environment. Humans respond to threats, distribute resources, and negotiate conflicts in interpersonal settings. Two lines of research elegantly illustrate how the expression of emotion conveys important information about objects and events in the environment.

One line of research has documented that fearful behavior facilitates observational learning of fearful responses in other individuals (e.g., Mineka, Davidson, Cook, & Keir, 1984; Mineka & Cook, 1993). In this research, observer monkeys viewed model monkeys' fearful, avoidant behavior, including their facial displays, in response to snakes or toy snakes. In subsequent test sessions with the snakes, observer monkeys demonstrated that they rapidly acquired the model monkeys' fear of the real and toy snakes. The correlations between models' and observers' fearful behavior typically reached the high .80s, even after just one observation of the model monkey.

Studies of *social referencing,* the process by which individuals use others' emotional displays to interpret ambiguous stimuli, have also documented that emotional displays provide important information about the environment (e.g., Klinnert et al., 1983; Walden & Ogan, 1988). These now-classic studies have demonstrated that parents' facial and vocal displays of positive emotion or fear will determine whether their infants will walk across a visual cliff (Sorce & Emde, 1981), play in a novel context, or respond to a stranger with positive emotion (reviewed in Klinnert et al., 1983).

Emotional experience provides an assessment of social relationships. Recently, theorists have emphasized the relational nature of the experience of emotion (e.g., Campos et al., 1989; Lazarus, 1991). According to this perspective, emotional experience provides information about intraindividual events such as the activity in the facial musculature or the autonomic nervous system (e.g., Buck, 1984; Levenson, Ekman, & Friesen, 1990), and the conditions of current social relations.

Empirical evidence indicating that individuals rely on their emotional experience to assess relationships along important dimensions is consistent with this perspective on emotional experience. For example, the experience of anger and guilt relates to perceptions of the fairness of personal relationships (e.g., Walster, Walster, & Berscheid, 1978; Solomon, 1990). The experience of embarrassment and shame relate to perceptions of social status vis-a-vis others (Gilbert & Trower, 1990; Tangney, Miller, Flicker, & Barlow, 1996). Theorists have also speculated that the experience of emotion provides an assessment of the level of commitment to a relationship, in the case of love and sympathy (Frank, 1988), and the extent to which ongoing social relations are propitious for the individual's reproductive success, in the case of happy and sad mood states (Nesse, 1990).

These observations indicate that individuals rely on their experience of emotion to assess their relationships with individuals who are both the cause and target of the emotion. Emotional experience also provides information about the

condition of social relations in general. Specifically, individuals experiencing moods and emotions elicited in one context will use those feelings to evaluate their relationships, even though the original cause of the emotion is unrelated to the relationship (e.g., Clore, 1994; Schwarz, 1990). For example, empirical studies have documented evidence that current mood or emotion influences individuals' evaluations of their general relationship satisfaction (e.g., Keltner, Locke, & Audrain, 1993), anger influences fairness judgments of ongoing interactions (Keltner et al., 1993), and fear influences the perception of the possible risks and losses associated with potential social interactions (Lerner & Keltner, 1997).

To summarize, theory and research indicate that emotional expression and experience provide important information about the sender's emotions, intentions, orientation to the relationship, and well-being; events or objects in the environment; and the conditions of social relations. Because emotions provide such valuable social information, theorists have argued that the communication of emotion is an important component of more complex discourse processes in which individuals negotiate interpersonal conflicts (e.g., Dunn & Munn, 1985) and reach a shared understanding about concepts of right and wrong (e.g., Bretherton, Fritz, Zahn-Waxler, & Ridgeway, 1986; White, 1990). Disturbances in emotional experience and expression, therefore, are likely to disrupt relationships in important ways. Disturbances in the intensity, type, and timing of emotional expression, for example, would deprive interaction partners of valuable information about ongoing interactions. Disturbances in emotional experience would likewise compromise the nature of information about his or her current relationships.

Evocative Functions of Emotions

Emotion theorists have long suggested that humans evolved adaptive responses to the emotional responses of others (e.g., Darwin, 1872; Ohman & Dimberg, 1978). This claim is consistent with the general assumption that the communicative behavior of sender and receiver co-evolved in reciprocal fashion (Eibl-Eibesfeldt, 1989; Hauser, 1996; Owren & Rendall, in press). From this perspective, one individual's

emotional expression serves as a social affordance that evokes "prepared" responses in others (e.g., Ohman & Dimberg, 1978). Studies of the evocative properties of emotional expressions suggest that emotions can evoke both complementary emotions and similar emotions in others.

Evocation of complementary emotions. Empirical studies have documented that emotional displays evoke *complementary emotions* in others, which we define as emotional responses that differ from that of the sender but that respond selectively to the sender's emotional display. These complementary emotions motivate important social behaviors, including helping, soothing, and forgiveness. At least three examples of the evocation of complementary emotional responses can be found in the empirical literature.

First, in a series of innovative conditioning studies, Ohman and Dimberg have documented how displays of anger evoke complementary fear in observers (reviewed in Dimberg & Ohman, 1996). For example, photographs of angry facial displays paired with an aversive, unconditioned stimulus were more resistant to extinction than photos of facial displays of happiness (Ohman & Dimberg, 1978). Strikingly, one study found that this conditioning effect was only observed when angry faces were directed towards the subject (Dimberg & Ohman, 1983). In subsequent research, anger faces that were "masked" by a neutral face presented immediately following the presentation of the anger faces, and presumably not consciously represented by the observer, still produced the conditioning effects described above and evoked elevated electrodermal responses associated with fear (Esteves, Dimberg, & Ohman, 1994).

Research on how distress displays elicit sympathy in others illustrates a second complementary emotion response. Developmental studies find that children respond with signs of distress, concern, and overt attempts to help in response to others' distress beginning at as early as 8 months of age (Zahn-Waxler & Radke-Yarrow, 1982). Studies of adults find that individuals feel sympathy and concern in proportion to others' observable signs of emotional distress (Batson & Shaw, 1991). Furthermore, there appears to be a pattern of sympathy-related expressive and physiological responses

that includes concerned gaze and oblique eyebrows and reduced heart rate that predicts helping behavior (Eisenberg et al., 1989).

A third complementary emotional response is found in studies of the evocative effects of embarrassment. These studies show that observers report high levels of affiliative emotions, such as amusement and sympathy, in response to others' displays of embarrassment and shame following social transgressions (Keltner, Young, & Buswell, 1997). In addition, a number of studies have found that when an individual displays embarrassment-related behavior following a mistake, observers report greater liking of the individual and, when relevant, more forgiveness (reviewed in Keltner & Buswell, 1997).

Evocation of similar emotions. Theorists have long been interested in the tendency for humans to respond to others' emotions with similar emotions (for historical review, see Hatfield, Rapson, & Cacioppo, 1994). Indeed, there is a good deal of research on the related phenomena of emotional mimicry (e.g., Davis, 1985), empathy (e.g., Hoffman, 1984), and vicarious emotional response (e.g., Miller, 1987). Although researchers need to more clearly specify the conditions under which individuals reciprocate each other's emotions, as well as the emotions that tend to be reciprocated, empirical evidence indicates that one individual's experience and display of emotion evokes comparable emotional responses in others. Specifically, studies have documented such reciprocal responses in the case of embarrassment (Miller, 1987), laughter (Provine, 1992), and distress or sadness (Batson & Shaw, 1991; Eisenberg et al., 1989).

Theorists have offered various speculations about the social benefits of the reciprocation of emotional response. First, the elicitation of similar emotion in others increases the likelihood that individuals will know one another's emotional states (e.g., Hoffman, 1984). The knowledge of others' emotional states in combination with empathic emotion, some theorists allege, is the foundation of moral emotions such as guilt (Hoffman, 1984) and moral behavior such as altruistic helping (Batson & Shaw, 1991). Second, just as alarm calls in nonhuman species coordinate the responses of conspecifics to a shared threat (e.g., Seyfarth & Cheney, 1990), reciprocated emotions are likely to coordinate the actions of several

individuals facing a similar object or event in the environment.

In sum, a substantial body of evidence indicates that emotional expression evokes complementary and similar emotional responses in others. Individuals predisposed to express certain emotions, therefore, are likely to evoke specific emotions in others with whom they interact. In certain instances, these evocative processes are beneficial for social relationships. In other instances, however, the evocation of emotion in others may prove to be problematic.

Incentive Functions of Emotions

Emotions coordinate social interactions in a third way: an individual's expression and experience of emotion may provide incentives for or reinforce another individual's social behavior within ongoing interactions (e.g., Klinnert et al., 1983). There have been few empirical studies that have directly examined the incentive functions of emotional expression. Relevant studies and related theoretical observations, however, suggest that individuals frequently engage in social behaviors contingent on or in anticipation of others' emotional experience and expression.

Developmental researchers have speculated that the display of positive emotion by both parents and children rewards desired behaviors, thus increasing the frequency of that behavior (e.g., Tronick, 1989). For instance, as infants carry out intentional behaviors with the assistance of their parents, such as grabbing an object, they will smile when their parents engage in behavior that facilitates their own goal-directed behavior and show signs of distress when the parents do not act in such fashion (Tronick, 1989). Other studies have shown that parents use positive emotional displays to direct the attention of their infants (Cohn & Tronick, 1987). More generally, it has been claimed that parental laughter facilitates learning by rewarding appropriate behavior in infants and children (Rothbart, 1973).

Studies of adult laughter reach similar conclusions about the incentive function of emotional behavior. For example, researchers have found that the temporal location of laughs within the ongoing stream of conversations is almost exclusively at the end of the utterance (Provine, 1993). Although there are several interpretations

of this finding (see Bachorowski, Smoski, & Owren, 1998), one plausible interpretation is that laughter serves as a reward for social behavior preceding it, offering praise for desirable utterances in the context of conversations. More generally, theorists have argued that laughter rewards many forms of desirable social behavior in the context of ongoing interactions (Bachorowski et al., 1998).

Several emotion-centered social behaviors seem to be motivated to elicit emotion in others. For example, one motive of teasing interactions is to embarrass the target of teasing (e.g., Keltner, Young, Oemig, Heerey, & Monarch, 1997). Although the embarrassment and humiliation produced by teasing can have many negative consequences (for review, see Keltner et al., 1997), teasing also can have positive outcomes. Specifically, teasing related to embarrassment often increases affiliation and can provide important information about the relationship, for example, whether individuals are romantically interested in one another.

Finally, to the extent that emotional displays provide incentives that guide social behavior, the reduction or absence of emotional displays should reduce the likelihood of contingent social behavior. A few studies provide indirect evidence in support of this claim. For example, experiments in which parents are instructed to mute their expressive behavior find that infants quickly become disturbed and disengaged (Tronick, Als, Adamson, Wise, & Brazelton, 1978). In conversations with individuals who are prone to low levels of positive emotion, participants engage in less responsive social behavior and experience the conversations as unrewarding (Thorne, 1987).

Summary of the Social-Functional Approach

We have argued that emotions coordinate social interactions by serving at least three functions. Emotions provide information about interacting individuals' emotions, intentions, and relational orientations. Emotions evoke complementary and similar emotions in others that motivate behaviors that benefit social relationships. The perception of emotion and anticipated elicitation of emotions in others serve as incentives for certain social behaviors. In these three ways, emotions provide structure

to social interactions, guiding, evoking, and motivating the actions of individuals in interactions in ways that enable individuals to meet their respective goals. Disturbances in emotional response, by implication, will have important consequences for the quality of social interactions and relationships.

Emotion and Social Interaction Disturbances in Psychopathology

Although different kinds of emotional disturbances figure prominently in the descriptions and manifestations of various psychological disorders, there have been relatively few empirical studies on the nature of these disturbances. By contrast, difficulties in social interactions, variously referred to as *social competence, social skills, social support,* and *social adjustment,* have been studied more extensively across a wide range of disorders. Although theorists have recently recognized the importance of linking the literatures on emotional and social disturbances in psychopathology (Blanchard & Panzarella, in press; Buck, 1991; Feldman, Philippot, & Custrini, 1991), these literatures remain largely unintegrated. By emphasizing the social functions of emotions, including the ways in which emotions coordinate social interactions, we believe that researchers will be able to more clearly make both conceptual and empirical connections between the nature of emotional and social disturbances in psychopathology.

In the following section, we first review the evidence for emotional disturbances and social interaction problems in four psychological disorders. We then provide a framework for integrating these two previously disparate literatures by considering the emotional disturbances in the context of a social-functional approach. That is, we link the emotion disturbances to informative, evocative, and incentive functions of emotion and then point to specific expectations and hypotheses and, when possible, relevant findings about the ways in which these emotion disturbances interfere with social functioning. Although many of the studies reviewed in the first half of this article considered how discrete emotions coordinate social interactions, much of the research on emotion disturbances in psychopathology has focused on broad dimensions of emotion, primarily due to the pervasive

nature of the emotion disturbances. Nonetheless, links between emotion dimensions and social interactions can also be made. For example, positive affect is associated with ratings of the frequency and duration of a number of social interactions and activities (Watson, 1988; Watson et al., 1992).

For several reasons, we chose to focus on four disorders: unipolar depression, schizophrenia, borderline personality disorder, and social phobia. First, emotional symptoms and interpersonal difficulties, including the formation and maintenance of relationships, figure prominently in each of these disorders. Second, we chose to focus on diagnosable disorders rather than broader psychological dimensions (e.g., distress, well-being) in hopes of providing an impetus for research on emotion and social deficits in disorders. Third, these disorders serve as exemplars of how disturbances in emotion influence maladaptive social interaction patterns. Finally, space constraints limit our ability to discuss other disorders, although we recognize that many other disorders also are characterized by emotional and social disturbances.

Unipolar Depression

Emotional disturbances. The prominent emotional features of unipolar depression include the phasic and enduring experience of sadness and the inability to experience pleasure (anhedonia). More broadly, depression is characterized by low levels of positive affect and heightened levels of negative affect (e.g., Watson, Clark, & Carey, 1988). People with low levels of positive affect are likely to experience emotions such as sadness and to be interpersonally disengaged. In contrast, people with high levels of negative affect are likely to frequently experience emotions such as anxiety, guilt, and anger.

One line of theorizing relevant to our interests holds that depression reflects deficits in a reward-oriented approach motivation system (Depue & Iacono, 1988; Depue, Krauss, & Spoont, 1987; Tomarken & Keener, in press). There is empirical support for this reasoning in studies linking relative hypoactivation in the left frontal hemisphere, which is thought to relate to approach-related emotion and motivation systems, to depression (e.g., Allen, Iacono, Depue, & Arbisi, 1993; Davidson, Schaffer, & Saron,

1985; Henriques & Davidson, 1991), risk for depression (Tomarken, Garber, & Simien, 1997), and low levels of positive affect (Tomarken, Davidson, Wheeler, & Doss, 1992). Tomarken and Keener (in press) have proposed that this pattern of brain activity may be a marker of risk for depression that is reflected by a number of deficits, including the relative incapacity to respond to positive emotional stimuli and self-regulatory deficits in the capacity to use positive events to shift into positive emotional states. Either of these deficits will likely interfere with social interactions insofar as social interaction requires goal-directed or reward-oriented approach behavior. Thus depressed people may not derive pleasure or reward from interpersonal relationships or interactions while currently depressed, perhaps due primarily to a diminution in positive affectivity. Moreover, depressed people may not seek out social interactions if they fail to help shift their mood from a predominantly negative state into a more positive one.

Although most studies of depression and emotional disturbance have concentrated on emotional experience, some evidence indicates that depressed patients may also exhibit flat, dull, and slowed speech (Buck, 1984; Hargreaves, Starkweather, & Blacker, 1965; Levin, Hall, Knight, & Alpert, 1985; Murray & Arnott, 1993; Scherer, 1986) and limited facial expressions, particularly expressions of positive emotions, as well as a decrease in overall body movement (Berenbaum & Oltmanns, 1992; Ekman & Friesen, 1974; Gotlib & Robinson, 1982; Jones & Pansa, 1979; Ulrich & Harms, 1985; Waxer, 1974). For example, one study found that depressed people showed fewer facial expressions in response to positive stimuli (but not to negative stimuli) than schizophrenic patients without flat affect and nonpatient controls (Berenbaum & Oltmanns, 1992).

Social disturbances. Empirical studies consistently find that depression is marked by disturbed relationships and social interactions (for reviews, see Barnett & Gotlib, 1988; Gotlib, 1992; Hokanson & Rubert, 1991). Specifically, both dysphoric and clinically depressed individuals have been found to have fewer social skills (e.g., Youngren & Lewinsohn, 1980), fewer close relationships (e.g., Billings & Moos, 1985; Brown & Harris, 1978; Gotlib & Lee, 1989), less elaborated social networks (Gotlib, 1992),

less rewarding relationships (Hokanson, Loewenstein, Heden, & Howes, 1986; Joiner, 1996; Joiner, Alfano, & Metalsky, 1992; Joiner & Metalsky, 1995; Nezlak, Imbrie, & Shean, 1994), fewer social contacts (Gotlib & Lee, 1989; but see Nezlak et al., 1994), less social support (e.g., Joiner, 1997; Lara, Leader, & Klein, 1997), and more marital problems and family arguments (e.g., Brown & Harris, 1978; Gotlib & Hooley, 1988; Gotlib & Lee, 1989; Monroe, Bromet, Connell, & Steiner, 1986; see Beach, Smith, & Fincham, 1994, for a review). Moreover, a number of these interpersonal deficits remain stable across periods of depression and remission (Barnett & Gotlib, 1988; Gotlib & Lee, 1989) and are predictive of future symptomatology and course (Billings & Moos, 1985; George, Blazer, Hughes, & Fowler, 1989; Joiner, 1997; Joiner et al., 1992; Joiner & Metalsky, 1995), even when controlling for initial levels of depressed mood, neuroticism, number of previous depressive episodes, and a prior history of dysthymia (Lara et al., 1997).

Linking emotional and social disturbances. The above findings suggest that depression is marked by low levels of positive affect, high levels of negative affect, diminished facial and vocal expressivity, and troubled interpersonal relationships. Our social-functional approach suggests a number of lines of inquiry and predictions concerning the relations between emotional and social disturbances.

Although not yet fully tested, heightened negative affect among depressed individuals likely communicates information about the state of interpersonal relationships that may further damage those relationships. Several studies are consistent with findings linking negative moods and emotions to assessments of reduced relationship satisfaction (e.g., Keltner et al., 1993). For example, depressed individuals have been found to be more pessimistic in expectations about their current and future social relationships than nondepressed individuals (e.g., Hokanson & Rubert, 1991) and to perceive family relationships as less supportive (Billings & Moos, 1985). Studies have also shown college students (particularly male participants) with depressive symptoms who repeatedly seek reassurance from their roommates to be more likely to be rejected by their roommates (e.g., Joiner, 1996; Joiner et al., 1992). In addition, to the extent that positive affect reflects engagement with the

environment (e.g., Watson, 1988), we would expect lowered levels of positive affect among depressed people to be associated with fewer initiations of social interaction. Although this remains an empirical question, it can be prospectively studied by assessing changes in positive (and negative) affect before, during, and after a depressive episode and then measuring the extent to which these changes are linked to increases or decreases in social interaction and the extent to which these individuals derive pleasure from interpersonal interactions and relationships. An alternative approach would be to predict changes in positive and negative affect from changes (i.e., quantity, quality) in interpersonal relationships.

Studies that have documented a robust relationship between marital dissatisfaction and depression (Beach et al., 1994) provide additional evidence related to the informative and evocative functions of emotion. Specifically, vocally expressed negative affect (e.g., Smith, Vivian, & O'Leary, 1990), self-reports of negative affect (e.g., Gottman & Levenson, 1986; Levenson, Carstenson, & Gottman, 1994), and vocal expression of specific negative emotions, such as contempt, anger, and fear (e.g., Gottman & Krokoff, 1989), during marital problem solving interactions have been linked to decreases in marital satisfaction. Beach and Fincham (1994) have hypothesized that individuals who are higher in negative affectivity may be more likely to evidence negative communication patterns in marital interactions and have greater marital dissatisfaction. Based on these findings, we would predict that negative affect may be an important mediator of the link between depression and marital discord. However, it is likely that increases in positive affect may also be necessary to improve marital communication in couples where one partner is depressed. Thus interventions aimed at changing emotion and mood may indirectly affect close relationships. By contrast, interventions aimed at improving marital relationships may also be beneficial for treating depression. In fact, a number of studies have shown that behavior marital therapy is not only effective for treating troubled marriages, but it is also effective at reducing depressive symptomatology in couples where one partner is depressed (see Beach et al., 1994, for a review).

Other recent evidence linked to the evocative functions of emotion indicates that depression elicits a number of predominantly negative emotions in others, including depression (e.g., Joiner, 1994; Joiner et al., 1992). For example, a recent study found that negative social interactions between caregivers and depressed individuals predicted caregivers' reports of depression and distress. Moreover, positive interactions did not buffer the relationship between caregiver demand and distress (Rauktis, Koeske, & Tereshko, 1995). Several studies have found that brief interactions with a depressed person elicit feelings of distress, anxiety, depression, and anger, even among strangers (e.g., Coyne, 1976; Marks & Hammen, 1982). However, consistent with the evidence concerning distress and sympathy, individuals instructed to be "helpers" to depressed people displayed support and expressions of concern (Marks & Hammen, 1982; Sacco, Milana, & Dunn, 1985). Continued exposure to a depressed person, however, is likely to induce more negative than positive emotions, particularly in the context of close relationships (Coyne, 1976; Joiner, 1994; Joiner et al., 1992).

Finally, the tendency for depressed people to display few positive expressions and to be unexpressive in general suggests that they will not provide positive incentive cues for others' social behavior and, more generally, will fail to provide important signals about emotional state, intentions, and objects or events in the environment to interaction partners. Evidence from the developmental literature suggests that depressed caregivers' limited or inappropriate facial and vocal emotional displays may have direct effects on infants' learning, behavior, and emotional regulation. For example, studies examining interactions between depressed mothers and their infants have shown that mothers often exhibit flat or negative facial and vocal expressions, avoid eye contact, and are less likely to be playful and attentive (e.g., Cohn & Campbell, 1992; Field, 1995). In addition, infants of depressed mothers have been found to be less playful, be less active, display less positive affect, and display more expressions of sadness and anger (e.g., Field, 1995; Field, Healy, Goldstein, & Guthertz, 1988; Pelaez-Nogueras et al., 1994; Pickens & Field, 1993). Infant-directed speech is believed to play a particularly important role in promoting the development of emotion regulation and attentional skills among infants, and a recent study has shown that the vocalizations of mothers with depressive symptoms failed to promote associative learning in 4-month-old infants (Kaplan, Bachorowski, & Zarlengo-Strouse, in press).

Schizophrenia

Emotional disturbances. Two of the more prominent emotional features of schizophrenia include *flat affect* (a lack of outward expression of emotion) and *anhedonia* (the inability to experience pleasure in situations that normally evoke pleasure). Experimental investigations using emotionally evocative stimuli have found that schizophrenic patients are less facially expressive than nonpatients in response to emotional films (Berenbaum & Oltmanns, 1992; Kring, Kerr, Smith, & Neale, 1993; Kring & Neale, 1996; Mattes, Schneider, Heimann, & Birbaumer, 1995) and cartoons (Dworkin, Clark, Amador, & Gorman, 1996) and during social interactions (Krause, Steimer, Sanger-Alt, & Wagner, 1989; Mattes et al., 1995), but report experiencing the same or greater amount of emotion and exhibit the same or greater amount of skin conductance reactivity as nonpatients (Kring, Germans, & Earnst, 1997; Kring & Earnst, 1998; Kring & Neale, 1996).

Blanchard and colleagues have studied the linkage among anhedonia, reports of experienced emotion in response to emotional stimuli, and reports of positive and negative affect among schizophrenic patients. These studies have documented the relationship of anhedonia to lower levels of state-positive affect in response to emotional films (Blanchard, Bellack, & Mueser, 1994), low levels of trait-positive affect and high levels of trait-negative affect, and *poorer social adjustment,* which was defined by interpersonal contacts, leisure, and romantic involvement (Blanchard, Mueser, & Bellack, in press).

Taken together, these findings suggest that schizophrenic patients experience positive emotion in response to emotionally evocative material but report experiencing little positive emotion more generally. The apparent contradiction between observations of anhedonia in schizophrenia and schizophrenic patients' reports of positive emotional experience following positive emotional stimuli may stem from

the possibility that anhedonia reflects more of a deficit in approach or anticipatory pleasure rather than consummatory pleasure (Germans & Kring, 1997; Klein, 1984; Simons, MacMillian, & Ireland, 1982). In other words, the attendant behavioral deficit associated with anhedonia may be the inability or lack of desire to approach or participate in pleasurable activities, including social interactions. Once in a pleasurable situation, however, anhedonic individuals may derive as much pleasure from the situation as nonanhedonic individuals. Delespaul (1995) noted that schizophrenic patients described themselves as "doing nothing" five times more often than nonpatient controls.

Social disturbances. Cumulative evidence indicates that compared to nonpatients, schizophrenic patients have poorer social adjustment (e.g., Mueser, Bellack, Morrison, & Wixted, 1990), fewer social skills (e.g., Liberman, 1982; Mueser, Bellack, Douglas, & Morrison, 1991), less elaborated social networks (e.g., Hammer, 1986), poorer social functioning in the community (e.g., Halford & Hayes, 1995), and less overall social competence (Bellack, Morrison, Wixted, & Mueser, 1990; Mueser et al., 1990). Although few researchers have attempted to study these social deficits in the context of emotion dysfunction (but see Blanchard & Panzarella, in press), a number of studies indirectly support the usefulness of linking these two research domains. For example, an important component of social-skills interventions for schizophrenic patients is the development of nonverbal and emotion-related behaviors (e.g., Liberman, DeRisi, & Mueser, 1989; Mueser & Sayers, 1992).

Linking emotional and social disturbances. Perhaps the most salient emotional disturbance in schizophrenia is diminished expressivity. This is likely to have important consequences for coordinated social interactions and interpersonal functioning. Although not designed to directly assess relations between emotion and marital relationships, a study by Hooley, Richters, Weintraub, and Neale (1987) found that spouses of schizophrenic patients with more negative symptoms, including flat affect, reported greater marital dissatisfaction than spouses of patients with predominantly positive symptoms. Hooley et al. speculated that symptoms such as flat affect may be particularly likely to contribute to nonsupportiveness from

others, including spouses. Although a number of factors likely contributed to these differences in marital satisfaction, it seems plausible to hypothesize that schizophrenic patients' diminished expressivity may have compromised the type of information their spouses received about the relationship.

Schizophrenic patients' lack of expressiveness also appears to evoke negative responses in others. For example, Krause, Steimer-Krause, and Hufnagel (1992) assessed facial expressions during a discussion of an emotionally evocative political topic in two different sets of stranger dyads. The first type of dyad comprised a schizophrenic patient and a non-ill (healthy) interaction partner; the second type of dyad comprised two healthy interaction partners. In findings similar to other studies, Krause et al. found that schizophrenic patients were less expressive than their healthy partners and the other dyad participants. However, the patients' healthy interaction partners were much less expressive, and they reported experiencing more sadness and fear than other healthy participants. Moreover, a significant proportion of the variance in these interaction partners' facial expressions and reports of experienced emotion was accounted for by the patients' (lack of) facial expressions.

As the evidence reviewed above suggests, schizophrenic patients may experience heightened negative affect, although their inability to express these feelings will likely preclude the evocation of sympathy and distress from others. Furthermore, insofar as schizophrenic patients have a deficit in the experience of pleasurable emotions, we would predict that schizophrenic patients will not benefit from cues signaling socially rewarding interactions that are provided by the experience of positive emotion. In addition, they will be less likely to provide cues that serve as positive incentives for others' social behavior.

One of the more robust predictors of relapse in schizophrenia is a psychosocial construct referred to as *Expressed Emotion* (EE; e.g., King & Dixon, 1996; Linszen et al., 1997; Parker & Hadzi-Pavlovic, 1990; see Hooley, 1985, and Miklowitz, 1994, for reviews). EE is defined by the amount of hostility, emotional overinvolvement, and critical comments a family member makes in reference to a schizophrenic relative during the course of a structured interview, and

cumulative evidence suggests that emotional overinvolvement and critical comments may be the most strongly linked to relapse. Although the reasons for this link to relapse are not yet fully understood (Jenkins & Karno, 1992), one plausible hypothesis is that schizophrenic patients misinterpret these negative messages from relatives, which may in turn contribute to a vicious cycle of misunderstood communication (Miklowitz, Goldstein, & Nuechterlein, 1995). Indeed, a number of studies have found that schizophrenic patients are not particularly skilled at perceiving emotion in others (e.g., Kerr & Neale, 1993; Mueser et al., 1996; Salem, Kring, & Kerr, 1996).

Social Phobia

Emotional disturbances. Social phobia is marked by extreme anxiety, fear, and avoidance of social situations that involve social interaction with other people, and performance and evaluation, such as speaking or eating in front of others (Liebowitz, 1987). It is important to note that the fear of these interactions and situations is truly social; individuals with social phobia do not experience anxiety when performing these behaviors while alone (Barlow, 1988). Several theorists have argued that social anxiety is, in some respects, an extreme manifestation of an adaptive response that has evolved to promote an individual's sensitivity to others' disapproval (Barlow, 1988) or integration into a social group (Baumeister & Leary, 1995; Miller & Leary, 1992), or to negotiate power and status differences (Gilbert & Trower, 1990). Social phobia arises, it is further proposed, when biological or psychological vulnerabilities to experience anxiety interact with life events that involve social interaction or performance (Barlow, 1988) or when trait social anxiety reaches extreme levels (Leary & Kowalski, 1995).

The most obvious emotional manifestation of social phobia is the heightened experience of anxiety, fear, and other negative emotions. Wallace and Alden (1997) assessed reports of positive and negative affect in social phobics and nonclinical controls following successful and unsuccessful social interactions. The success of the interaction was manipulated by either giving positive feedback throughout and following the interaction (successful) or by withholding encouraging comments and appropriate

nonverbal behavior during the interaction and providing negative feedback following the interaction (unsuccessful). Not surprisingly, both the social phobics and controls reported more negative affect following the unsuccessful social interaction than the successful one. However, social phobics reported significantly greater negative and less positive affect than controls following both kinds of interactions.

To our knowledge, no study has systematically examined facial expressions of emotion and other nonverbal behavior among individuals with social phobia. One study, however, suggests that individuals with social phobia display nonverbal behaviors characteristic of anxiety. Marcus and Wilson (1996) studied social anxiety among college women during an observed speaking task. Observers' ratings of anxiety were significantly related to speakers' reports of anxiety even though speakers rated themselves as more anxious than they were rated by observers. These findings indirectly suggest that social anxiety comprises relatively easily recognizable nonverbal behaviors and cues.

Social disturbances. Cumulative evidence suggests that when confronted with a social interaction, individuals with high social anxiety are less likely to be engaged in the interaction, speak less, have reduced eye contact, and work to exit the interaction rapidly (Leary & Kowalski, 1995; Schlenker & Leary, 1982). Individuals with social phobia are likely to have fewer sources of social support and fewer social interactions than individuals without social phobia (Davidson, Hughes, George, & Blazer, 1993). In addition, observers perceive socially anxious individuals to be less socially skilled than low anxious individuals (Leary & Kowalski, 1995). Similarly, people with social phobia have less favorable perceptions of their own social abilities than others do (Wallace & Alden, 1997). However, perceptions of social skill and ability likely have important and powerful effects on their social behavior, the manifestation of extreme anxiety is probably more central to disruptions in social interactions.

Linking emotional and social disturbances. Although speculative, our social-functional approach suggests several predictions about the manner in which the emotional disturbances in social phobia may interfere with social interactions and relationships. For example, given the

documented association between the experience of fear and perceptions about the riskiness of possible interactions (Lerner & Keltner, 1997), one would expect heightened fear to bias the person with social phobia's perceptions of interactions, which would likely contribute to their unwillingness to engage in various interactions. Ironically, acute fear and avoidance of embarrassment may encourage them to avoid certain interactions, such as teasing that, although embarrassing, increase affiliation (Keltner et al., 1997).

To the extent that people with social phobias produce reliable displays of heightened fear and anxiety, these displays should have an array of important effects on interactions and relationships. One might expect such a person to communicate to others the inordinate risk of embarrassment in social interaction, thus precluding approach-related behavior in others. They may evoke complementary fear and anxiety in others, which would increase the likelihood that interactions with people who are socially phobic will be more frustrating and distressing and perhaps eventually avoided.

Borderline Personality Disorder

Emotional disturbances. Deficient emotion regulation is one of the cardinal manifestations of borderline personality disorder (BPD). Theorists, researchers, and clinicians have variously referred to this disturbance in emotion regulation as *emotional oversensitivity, affective instability,* or *excessive mood fluctuations* (e.g., Farchaus-Stein, 1996; Levine, Marziali, & Hood, 1997; Lumsden, 1993), and some theorists have speculated that individuals with BPD have difficulty returning to an "emotional baseline" following an emotional event (Linehan, 1987; Snyder & Pitt, 1985; but see Farchaus-Stein, 1996). Several of the *DSM–IV* criteria for BPD involve emotion, such as affective instability, inappropriate or intense anger, difficulty controlling anger, and chronic feelings of emptiness (American Psychiatric Association [APA], 1994). Not surprisingly, BPD patients report chronic and intense feelings of a number of negative emotions, including anger, hostility, depression, loneliness, and anxiety (e.g., Coid, 1993; Farchaus-Stein, 1996; Gunderson, Carpenter, & Strauss, 1975; Gunderson & Phillips, 1991; Kruedelbach, McCormick,

Schultz, & Grueneich, 1993; Soloff, 1981; Soloff & Ulrich, 1981; Snyder & Pitt, 1985). BPD patients also exhibit a number of emotion-related maladaptive behaviors, such as suicidal gestures, aggression, avoidance, overreacting, and other impulsive acts. Theorists have suggested that these behaviors are enacted as a means of attempting to regulate negative emotions (e.g., Linehan, 1987; Paris, 1992; Shearin & Linehan, 1994).

In one of the first studies to systematically examine emotion-processing deficits in BPD, Levine and colleagues administered self-report measures of emotional awareness, emotional intensity, and the ability to coordinate mixed emotions, as well as a test of facial emotion perception to BPD outpatients and nonpatient controls. Compared to controls, BPD patients were less aware of their own and others' emotions, had fewer empathetic responses, had fewer mixed valence responses, reported more intense negative but not positive emotions, and performed more poorly on a test of facial emotion perception (Levine et al., 1997). Grounded in a dimensional perspective on emotion, Farchaus-Stein (1996) assessed daily reports of emotion among BPD patients using an experience sampling method. Patients carried a pager and were randomly paged 5 times a day for 10 consecutive days. When paged, patients filled out a self-report measure of emotion adjectives making up the valence and activation dimensions of emotion (cf. Larsen & Diener, 1992). Compared to nonpatients, BPD patients reported higher levels of unpleasant and activated unpleasant emotions across the 10 days. In addition, the variability of negative emotion (unpleasant, activated unpleasant, unactivated unpleasant) was greater among BPD patients than nonpatients. It is important to note that no differences between BPD patients and controls were found for either level or variability of positive emotion. Thus, not only do patients with BPD report experiencing more negative emotion than controls, their negative emotions are also much more variable (see also Cowdry, Gardner, O'Leary, Leibenluft, & Rubinow, 1991).

Trull and colleagues (e.g., Trull, 1995; Trull, Useda, Conforti, & Doan, 1997) have studied emotional, cognitive, and interpersonal features of BPD among nonclinical college students who were not seeking treatment for BPD but who

nonetheless demonstrated a number of BPD features. Individuals with a high number of BPD features reported greater trait-negative affect, hostility, anxiety, and depression, and less trait-positive affect than control participants who had no BPD features.

Social disturbances. Interpersonal difficulties are also prevalent among BPD patients (Benjamin, 1993; Millon & Davis, 1996), and are included in the *DSM–IV* diagnostic criteria for BPD (APA, 1994). For example, BPD patients perceive both their current and past relationships as more hostile and as lacking in cohesion than patients with unipolar depression or bipolar disorder (Benjamin & Wonderlich, 1994; Soloff & Millward, 1983). Although it remains unclear whether BPD patients are more socially maladjusted than patients with other personality disorders, their relationships are often filled with conflict and often lack reciprocity (e.g., Modestin & Villiger, 1989). Moreover, evidence suggests that BPD individuals have more avoidant, ambivalent, and hostile attachment styles (Sack, Sperling, Fagen, & Foelsch, 1996). Trull (1995) found that individuals with many BPD features scored higher on measures of interpersonal sensitivity and distress. In a 2-year follow-up, these individuals continued to manifest interpersonal problems, even after controlling for the contributions of gender and other disorders (Trull et al., 1997).

Linking emotional and social disturbances. Although the social and emotional disturbances in BPD have not been as well studied as in other disorders, the social-functional approach suggests several lines of inquiry on the linkage between emotion and social disturbances. The displays of anger and hostility likely convey important information about the status of significant relationships, and may, for example, initially elicit fear and avoidance in interaction partners. Benjamin (1993) applied her interpersonal model, structural analysis of social behavior (SASB), to the *DSM–IV* criteria for the personality disorders, including borderline personality disorder. She defined interpersonal aspects or regulators for nearly all BPD symptoms. In her model, symptoms related to anger are interpreted as interpersonal if a caregiver or interaction partner is viewed by a BPD patient as neglectful or abandoning. Anger, Benjamin speculated, is expressed to gain a loved one's attention. Based on Benjamin's

analysis, we might predict that a caregiver's reactions of fear or avoidance may be misinterpreted by a BPD individual as abandonment or rejection, thus increasing the probability that more anger will be experienced and likely expressed. Unfortunately, Benjamin did not apply the SASB model to the symptom of affective instability.

Lumsden (1993) described a similar, reciprocal cycle of emotion and interpersonal distress among BPD patients and loved ones that is triggered by the experience of negative emotion and negative interpersonal encounters. As noted earlier, Frank (1988) suggested that the experience of positive emotions, such as love and sympathy, provides an index of the level of commitment to a relationship. For those people who interact regularly with BPD patients, they are likely to experience a number of negative interactions marked by high levels of negative emotions (e.g., anger, hostility). Lumsden argued that interaction partners will likely respond with less affirmation and commitment than they had responded with in previously positive interactions and that BPD patients will be more likely to attend to these negative reactions since they will likely be congruent with their current mood state. To break this cycle, BPD patients may resort to impulsive behaviors, such as suicide attempts, as a means of gaining more attention and, in their eyes, more commitment from loved ones. Thus the experience and expression of anger may deter others' rewarding social behavior, thus not providing incentive for social approach and interaction. Moreover, marked instability of negative emotion will likely lead to a more guarded interaction style by loved ones of BPD patients.

Summary and Prospects for Future Research

We have argued that the study of emotion function and dysfunction are necessarily intertwined and mutually informative. Studies of the social functions of emotions offer the promise of identifying potential origins and social consequences of emotional disturbances in psychopathology. Studies of the nature of emotional disturbances in psychopathology can help to delineate the manner in which various social functions of emotion can be impeded.

Given the pervasive nature of emotional disturbances in various forms of psychopathology, it is surprising that psychopathology researchers have only recently begun to study emotional processing. Although this relative dearth of research can be attributed in part to the fact that reliable methods for measuring emotion have only recently been developed, we believe that the lack of a clear and readily applicable conceptual framework for studying emotion and psychopathology has also stalled empirical research. Our social-functional account of emotion provides a framework within which researchers can develop and test hypotheses about the nature of emotion disturbances in psychopathology. Moreover, this approach facilitates the integration of studies of emotional and social dysfunction in psychopathology insofar as many of the emotional features of different disorders have important relational consequences. For instance, this approach leads us to predict that an individual with social phobia will display facial expressions of fear and other negative emotions that will discourage others from interacting with that individual.

Finally, this conceptual framework has intervention implications for psychopathology. Interventions initially targeted toward an emotional disturbance in psychopathology may indirectly modify some of the social-functional consequences of that disturbance. On the other hand, interventions aimed at alleviating social or interpersonal difficulties, as is done in social-skills training, for example, might also impact emotional disturbances. An integrated intervention approach, including both psychosocial and psychopharmacologic interventions, that targets the bidirectional influence of emotion and social dysfunction will likely be most beneficial. For example, recent evidence indicates that sleep deprivation plus antidepressant medication is selectively linked to an increase in positive affect among depressed patients (Tomarken, Elkins, Anderson, Shelton, & Hitt, 1997). Increases in positive affect among depressed individuals may correspond to increases in social activity, particularly if psychosocial interventions (e.g., cognitive–behavioral or interpersonal psychotherapy) are used in conjunction with pharmacotherapy. Thus, pharmacologic interventions that impact positive affect may indirectly alter social approach and interaction behaviors. However, including a psychosocial treatment component to the intervention package would increase the likelihood that emotional and social functioning would be positively impacted.

In order for these intervention implications to be more fully realized, however, researchers and clinicians need to augment their outcome assessment procedures to include measures of emotional and social functioning. Moreover, certain intervention strategies, such as social-skills training, could be strengthened by including components that target emotional disturbances (e.g., expressing emotion at the right time in the appropriate contexts; interpreting emotions in others) as well as the performance of socially skilled behavior.

Research Recommendations

In order to move forward, many of the speculations that we have summarized in this article, research on the social functions of emotion and emotional disorders needs to progress in several ways. First, we believe that researchers interested in the interface between the social functions of emotion and social interaction are best served by studying individuals in meaningful relationships in actual social interactions. It is in the context of social interactions where the social functions of emotion are likely to be most apparent. Fortunately, there are several models of this kind of research, including work on marital relations (Gottman & Levenson, 1986), depressed mothers and children (Field, 1995), and siblings (Dunn & Munn, 1985). Moreover, basic research on emotion provides insight into which interactions should be studied and how emotions shape these interactions. For example, interactions such as flirtation, teasing, disclosure, conflict resolution, and appeasement, are critical to the formation and maintenance of personal relationships.

We also believe that, regarding the first recommendation, it is important that researchers examine emotion within the stream of behavior in ongoing social interactions. That is, studying the timing, context, and reciprocation of emotion during interactions will provide valuable information about how emotions shape those interactions. We have followed the insights of others (e.g., Averill, 1982; Campos et al., 1989; Lazarus, 1991), and we have argued that

emotions are relational processes. By implication, researchers should examine emotions as dynamic processes within interactions. Years of basic research on emotion have identified different units of individual emotional response, including characteristic facial displays, physiological responses, action tendencies, evoked responses, and correspondent inferences. Based on this cumulative evidence, researchers can examine how these units coalesce to form the bases of social interactions (e.g., Fernández-Dols & Ruiz-Belda, 1997) and how specific emotional disturbances result in maladaptive social interactions.

Third, the emphasis on the relational nature of emotion highlights the need for new measures of emotion. Researchers have recently developed several such measures, including those concerned with the synchrony of individuals' emotions (e.g., Field et al., 1988), the extent to which negative emotions are reciprocated (Levenson & Gottman, 1983), and the contingency between one individual's emotion and another's social behavior (Cohn & Tronick, 1987; Field, 1995). Our analysis of emotion and the coordination of social interaction points to other possible methods of studying relational emotion. Measures of the extent to which emotional expression predicts subsequent action (for example, soothing, threat, avoidance, or disengagement) and that observers' spontaneous inferences will illuminate the informative properties of emotion within social interactions. Measures of the timing, intensity, and kind of emotional response that one individual's emotion evokes in an interaction partner will index the evocative properties of his or her emotion within that interaction. Measures of the contingencies between social behavior and partners' positive emotional response will index the incentive properties of interaction partners' emotional behavior.

In summary, a social-functional account of emotion offers much promise toward an understanding of emotions more generally, and emotion disturbances in psychopathology more specifically. This approach provides a conceptual framework for studying both emotion and social disturbances in psychopathology in ways that advance and integrate these respective fields. Whereas the mean in emotional response may be most informative of personal virtue, as Aristotle argued long ago, the study of devia-

tions from the mean may prove to yield several insights into the nature of emotion and emotional disorders.

References

Allen, J. J., Iacono, W. G., Depue, R. A., & Arbisi, P. (1993). Regional EEG asymmetries in bipolar seasonal affective disorder before and after photo-therapy. *Biological Psychiatry, 33,* 642–646.

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.

Aristotle. (1985). *Nicomachaen ethics* (T. Irwin, Trans.). Indianapolis, IN: Hackett.

Averill, J. R. (1980). A constructivist view of emotion. In R. Plutchik & H. Kellerman (Eds.), *Emotion: Theory, research, and experience* (pp. 305–339). New York: Academic Press.

Averill, J. R. (1982). *Anger and aggression.* New York: Springer-Verlag.

Averill, J. R. (1992). The structural bases of emotional behavior. In M. S. Clark (Ed.), *Emotion* (pp. 1–24). Newbury Park, CA: Sage.

Bachorowski, J.-A., Smoski, M. J., & Owren, M. J. (1998). *Acoustic properties of laughter.* Manuscript in preparation, Vanderbilt University.

Barlow, D. H. (1988). *Anxiety and its disorders.* New York: Guilford Press.

Barlow, D. H. (1991). Disorders of emotion. *Psychological Inquiry, 2,* 58–71.

Barnett, P. A., & Gotlib, I. H. (1988). Psychosocial functioning and depression: Distinguishing among antecedents, concomitants, and consequences. *Psychological Bulletin, 104,* 97–126.

Barrett, K. C., & Campos, J. J. (1987). Perspectives on emotional development II: A functionalist approach to emotions. In J. D. Osofsky (Ed.), *Handbook of infant development* (2nd ed., pp. 555–578). New York: Wiley-Interscience.

Batson, C. D., & Shaw, L. L. (1991). Evidence for altruism: Toward a pluralism of prosocial motives. *Psychological Inquiry, 2,* 107–122.

Baumeister, R. F., & Leary, M. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin, 117,* 497–529.

Baumeister, R. F., Stillwell, A. M., & Heatherton, T. F. (1994). Guilt: An interpersonal approach. *Psychological Bulletin, 115,* 243–267.

Beach, S. R. H., & Fincham, F. D. (1994). Toward an integrated model of negative affectivity in marriage. In S. M. Johnson & L. S. Greenberg (Eds.), *Emotion in marriage and martial therapy* (pp. 227–255). New York: Bruner/Mazel.

Beach, S. R. H., Smith, D. A., & Fincham, F. D. (1994). Marital interventions for depression: Empirical foundation and future prospects. *Applied and Preventive Psychology, 3,* 233–250.

Bellack, A. S., Morrison, R. L., Wixted, J. T., & Mueser, K. T. (1990). An analysis of social competence in schizophrenia. *British Journal of Psychiatry, 156,* 809–818.

Benjamin, L. S. (1993). *Interpersonal diagnosis and treatment of personality disorders.* New York: Guildford Press.

Benjamin, L. S., & Wonderlich, S. A. (1994). Social perceptions and borderline personality disorder: The relation to mood disorders. *Journal of Abnormal Psychology, 103,* 610–624.

Berenbaum, H., & Oltmanns, T. F. (1992). Emotional experience and expression in schizophrenia and depression. *Journal of Abnormal Psychology, 101,* 37–44.

Billings, A. G., & Moos, R. H. (1985). Psychosocial processes of remission in unipolar depression: Comparisons of depressed patients with matched community controls. *Journal of Consulting and Clinical Psychology, 53,* 314–325.

Blanchard, J. J., Bellack, A. S., & Mueser, K. T. (1994). Affective and social-behavioral correlates of physical and social anhedonia in schizophrenia. *Journal of Abnormal Psychology, 103,* 719–728.

Blanchard, J. J., Mueser, K. T., & Bellack, A. S. (in press). Anhedonia, positive and negative affect, and social functioning in schizophrenia. *Schizophrenia Bulletin.*

Blanchard, J. J., & Panzarella, C. (1998). Affect and social functioning in schizophrenia (pp. 181–196). In K. T. Mueser & N. Tarrier (Eds.), *Handbook of social functioning.* Needham Heights, MA: Allyn & Bacon.

Bowlby, J. (1969). *Attachment.* New York: Basic Books.

Bretherton, I., Fritz, J., Zahn-Waxler, C., & Ridgeway, D. (1986). Learning to talk about emotions: A functionalist perspective. *Child Development, 57,* 529–548.

Brown, G. W., & Harris, T. (1978). *Social origins of depression.* London: Free Press.

Buck, R. (1984). *The communication of emotion.* New York: Guilford Press.

Buck, R. (1991). Temperament, social skills, and the communication of emotion: A developmental-interactionist view. In D. G. Gilbert & J. J. Connolly (Eds.), *Personality, social skills, and psychopathology: An individual differences approach* (pp. 85–106). New York: Plenum Press.

Buss, D. (1992). Male preference mechanisms: Consequences for partner choice and intrasexual competition. In J. H. Barkow, L. Cosmides, & J. Tooby (Eds.), *The adapted mind* (pp. 267–288). New York: Oxford University Press.

Campos, J. J., Campos, R. G., & Barrett, K. C. (1989). Emergent themes in the study of emotional development and emotion regulation. *Developmental Psychology, 25,* 394–402.

Clark, C. (1990). Emotions and the micropolitics in everyday life: Some patterns and paradoxes of "Place." In T. D. Kemper (Ed.), *Research agendas in the sociology of emotions* (pp. 305–334). Albany: State University of New York Press.

Clark, L. A., & Watson, D. (1991). Tripartite model of anxiety and depression: Psychometric evidence and taxonomic implications. *Journal of Abnormal Psychology, 100,* 316–336.

Clore, G. (1994). Why emotions are felt. In P. Ekman & R. J. Davidson (Eds.), *The nature of emotion* (pp. 103–111). New York: Cambridge University.

Cohn, J. F., & Cambell, S. B. (1992). Influence of maternal depression on infant affect regulation. In D. Cicchetti & S. Toth (Eds.), *Rochester symposium on developmental psychopathology Vol. 4: Developmental perspectives on depression* (pp. 103–130). Rochester, NY: University of Rochester Press.

Cohn, J. F., & Tronick, E. Z. (1987). Mother–infant face-to-face interaction: The sequence of dyadic states at 3, 6, and 9 months. *Developmental Psychology, 23,* 68–77.

Coid, J. W. (1993). An affective syndrome in psychopaths with borderline personality disorder. *British Journal of Psychiatry, 162,* 641–650.

Cowdry, R., Gardner, D. L., O'Leary, K. M., Leibenluft, E., & Rubinow, D. R. (1991). Mood variability: A study of four groups. *American Journal of Psychiatry, 148,* 1505–1511.

Coyne, J. C. (1976). Toward an interactional description of depression. *Psychiatry, 39,* 28–40.

Darwin, C. (1872). *The expression of emotions in man and animals.* New York: Philosophical Library.

Davidson, R. J. (1993). Parsing affective space: Perspectives from neuropsychology and psychophysiology. *Neuropsychology, 7,* 464–475.

Davidson, J. R., Hughes, D. L., George, L. K., & Blazer, D. G. (1993). The epidemiology of social phobia: Findings from the Duke Epidemiological Catchment Area Study. *Psychological Medicine, 23,* 709–718.

Davidson, R. J., Schaffer, C. E., & Saron, C. (1985). Effects of lateralized presentations of faces on self-reports of emotion and EEG asymmetry in depressed and non-depressed subjects. *Psychophysiology, 22,* 353–364.

Davis, M. R. (1985). Perceptual and affective reverberation components. In A. P. Goldstein & G. Y. Michaels (Eds.), *Empathy: Development, theory, and consequences* (pp. 62–110). Hillsdale, NJ: Erlbaum.

Delespaul, P. A. E. G. (1995). *Assessing schizophrenia in daily life*. Maastricht, The Netherlands: Universitaire Pers Maastricht.

Depue, R. A., & Iacono, W. G. (1988). Neurobehavioral aspects of affective disorders. *Annual Review of Psychology, 40,* 457–492.

Depue, R. A., Krauss, S. P., & Spoont, M. R. (1987). A two dimensional threshold model of seasonal bipolar affective disorder. In D. Magnusson & A. Ohman (Eds.), *Psychopathology: An interactional perspective* (pp. 95–123). New York: Academic Press.

De Rivera, J., & Grinkis, C. (1986). Emotions as social relationships. *Motivation and Emotion, 10,* 1986.

Dimberg, U., & Ohman, A. (1983). The effects of directional facial cues on electrodermal conditioning to facial stimuli. *Psychophysiology, 20,* 160–167.

Dimberg, U., & Ohman, A. (1996). Behold the wrath: Psychophysiological responses to facial stimuli. *Motivation and Emotion, 20,* 149–182.

Dunn, J., & Munn, P. (1985). Becoming a family member: Family conflict and the development of social understanding in the second year. *Child Development, 56,* 480–492.

Dworkin, R., Clark, S. C., Amador, X. F., & Gorman, J. M. (1996). Does affective blunting in schizophrenia reflect affective deficit or neuromotor dysfunction? *Schizophrenia Research, 20,* 301–306.

Eibl-Eibesfeldt, I. (1989). *Human ethology.* New York: Aldine de Gruyter Press.

Eisenberg, N., Fabes, R. A., Miller, P. A., Fultz, J., Shell, R., Mathy, R. M., & Reno, R. R. (1989). Relation of sympathy and distress to prosocial behavior: A multimethod study. *Journal of Personality and Social Psychology, 57,* 55–66.

Ekman, P. (1984). Expression and the nature of emotion. In K. Scherer & P. Ekman (Eds.), *Approaches to emotion.* (pp. 319–344). Hillsdale, NJ: Erlbaum.

Ekman, P. (1992). An argument for basic emotions. *Cognition and Emotion, 6,* 169–200.

Ekman, P. (1993). Facial expression and emotion. *American Psychologist, 48,* 384–392.

Ekman, P., & Friesen, W. V. (1974). Nonverbal behavior and psychopathology. In R. J. Friedman & M. M. Katz (Eds.), *The psychology of depression: Contemporary theory and research* (pp. 203–232). Washington, DC: Wiley.

Esteves, F., Dimberg, U., & Ohman, A. (1994). Automatically elicited fear: Conditioned skin conductance responses to masked facial expressions. *Cognition and Emotion, 8,* 393–413.

Farchaus-Stein, K. (1996). Affect instability in adults with a borderline personality disorder. *Archives of Psychiatric Nursing, 10,* 32–40.

Feldman, R. S., Philippot, P., & Custrini, R. J. (1991). Social competence and nonverbal behavior. In R. S. Feldman & B. Rimé (Eds.), *Fundamentals of nonverbal behavior* (pp. 329–350). Cambridge, England: Cambridge University Press.

Fernández-Dols, J. M., & Ruiz-Belda, M.-A. (1997). Spontaneous facial behavior during intense emotional episodes: Artistic truth and optical truth. In J. M. Russell & J. M. Fernández-Dols (Eds.), *The psychology of facial expression* (pp. 255–274). Cambridge, England: Cambridge University Press.

Field, T. (1995). Infants of depressed mothers. *Infant Behavior and Development, 18,* 1–13.

Field, T., Healy, B., Goldstein, S., & Guthertz, M. (1988). Behavior-state matching and synchrony in mother-infant interactions of nondepressed versus depressed dyads. *Developmental Psychology, 26,* 7–14.

Fiske, A. P. (1992). The four elementary forms of sociality. Framework for a unified theory of social relations. *Psychological Review, 99,* 689–723.

Frank, R. H. (1988). *Passions within reason.* New York: Norton.

Fridlund, A. J. (1991). Evolution and facial action in reflex, social motive, and paralanguage. *Biological Psychology, 32,* 3–100.

Fridlund, A. J. (1992). The behavioral ecology and sociality of human faces. *Review of Personality and Social Psychology, 13,* 90–121.

Frijda, N. (1986). *The emotions.* Cambridge, England: Cambridge University Press.

Frijda, N. H., & Mesquita, B. (1994). The social roles and functions of emotions. In S. Kitayama & H. Marcus (Ed.), *Emotion and culture: Empirical studies of mutual influenced* (pp. 51–87). Washington, DC: American Psychological Association.

George, L. K., Blazer, D. G., Hughes, D. C., & Fowler, N. (1989). Social support and the outcome of major depression. *British Journal of Psychiatry, 154,* 478–485.

Germans, M. K., & Kring, A. M. (1997, October). *Hedonic deficit in anhedonia: Support for the role of approach motivation.* Poster presented at the meeting of the Society for Research in Psychopathology, Palm Springs,CA.

Gilbert, P., & Trower, P. (1990). The evolution and manifestation of social anxiety. In W. R. Crozier (Ed.), *Shyness and embarrassment* (pp. 144–177). New York: Cambridge University Press.

Gotlib, I. H. (1992). Interpersonal and cognitive aspects of depression. *Current Directions in Psychological Science, 1,* 149–154.

Gotlib, I. H., & Hooley, J. M. (1988). Depression and marital distress: Current status and future directions. In S. Duck (Ed.), *Handbook of personal relationships* (pp. 543–570). Winchester, England: Wiley.

Gotlib, I. H., & Lee, C. (1989). The social functioning of depressed patients: A longitudinal assessment. *Journal of Social and Clinical Psychology, 8,* 223–237.

Gotlib, I. H., & Robinson, L. A. (1982). Responses to depressed individuals: Discrepancies between self-report and observer-rated behavior. *Journal of Abnormal Psychology, 91,* 231–240.

Gottman, J. M., & Krokoff, L. J. (1989). Marital interaction and satisfaction: A longitudinal view. *Journal of Consulting and Clinical Psychology, 57,* 47–52.

Gottman, J. M., & Levenson, R. W. (1986). Assessing the role of emotion in marriage. *Behavioral Assessment, 8,* 31–48.

Gunderson, J. G., Carpenter, W. T., & Strauss, J. S. (1975). Borderline and schizophrenic patients: A comparative study. *American Journal of Psychiatry, 132,* 1259–1264.

Gunderson, J. G., & Phillips, K. A. (1991). A current view of the interface between borderline personality disorder and depression. *American Journal of Psychiatry, 148,* 967–975.

Halford, W. K., & Hayes, R. L. (1995). Social skills in schizophrenia: Assessing the relationship between social skills, psychopathology, and community functioning. *Social Psychiatry and Psychiatric Epidemiology, 30,* 14–19.

Hammer, M. (1986). The role of social networks in schizophrenia. In G. D. Burrow, T. R. Norman, & G. Rubinstein (Eds.), *Handbook of studies on schizophrenia, Part 2* (pp. 115–128). New York: Elsevier Science.

Hargreaves, W., Starkweather, J., & Blacker, K. (1965). Voice quality in depression. *Journal of Abnormal Psychology, 70,* 218–229.

Hatfield, E., Cacioppo, J. T., & Rapson, R. L. (1994). *Emotional contagion.* New York: Cambridge University Press.

Hauser, M. D. (1996). *The evolution of communication.* Cambridge, MA: MIT Press.

Hazan, C., & Shaver, P. (1987). Romantic love conceptualized as an attachment process. *Journal of Personality and Social Psychology, 52,* 511–524.

Henriques, J. B., & Davidson, R. J. (1991). Left frontal hypoactivation in depression. *Journal of Abnormal Psychology, 100,* 535–545.

Hoffman, M. L. (1984). Interaction of affect and cognition in empathy. In C. Izard, J. Kagan, & R. Zajonc (Eds.), *Emotions, cognition, and behavior* (pp. 103–131). New York: Cambridge University Press.

Hokanson, J. E., Loewenstein, D. A., Heden, C., & Howes, M. (1986). Dysphoric college students and roommates: A study of social behaviors over a three-month period. *Personality and Social Psychology Bulletin, 12,* 311–324.

Hokanson, J. E., & Rubert, M. P. (1991). Interpersonal factors in depression. In D. G. Gilbert & J. J. Connolly (Eds.), *Personality, social skills, and psychopathology: An individual differences approach* (pp. 157–184). New York: Plenum Press.

Hooley, J. M. (1985). Expressed emotion: A critical review of the literature. *Clinical Psychology Review, 5,* 119–139.

Hooley, J. M., Richters, J. E., Weintraub, S., & Neale, J. M. (1987). Psychopathology and marital distress: The positive side of positive symptoms. *Journal of Abnormal Psychology, 96,* 27–33.

Izard, C. E. (1977). *Human emotions.* New York: Plenum Press.

Jenkins, J. H., & Karno, M. (1992). The meaning of expressed emotion: Theoretical issues raised by cross-cultural research. *American Journal of Psychiatry, 149,* 9–21.

Joiner, T. E. (1994). Contagious depression: Existence, specificity to depressed symptoms, and the role of reassurance seeking. *Journal of Personality and Social Psychology, 67,* 287–296.

Joiner, T. E. (1995). The price of soliciting and receiving negative feedback: Self-verification theory as a vulnerability to depression theory. *Journal of Abnormal Psychology, 104,* 364–372.

Joiner, T. E. (1996). Depression and rejection: On strangers and friends, symptom specificity, length of relationship, and gender. *Communication Research, 23,* 451–471.

Joiner, T. E. (1997). Shyness and low social support as interactive diatheses, with loneliness as mediator: Testing an interpersonal-personality view of vulnerability to depressive symptoms. *Journal of Abnormal Psychology, 106,* 386–394.

Joiner, T. E., Alfano, M. S., & Metalsky, G. I. (1992). When depression breeds contempt: Reassurance seeking, self-esteem, and rejection of depressed collage students by their roommates. *Journal of Abnormal Psychology, 101,* 165–173.

Joiner, T. E., & Metalsky, G. I. (1995). A prospective test of an integrative interpersonal theory of depression: A naturalistic study of college roommates. *Journal of Personality and Social Psychology, 69,* 778–788.

Jones, I. H., & Pansa, M. (1979). Some nonverbal aspects of depression and schizophrenia occurring during the interview. *Journal of Nervous and Mental Disease, 167,* 402–409.

Kaplan, P. S., Bachorowski, J.-A., & Zarlengo-Strouse, P. (in press). Infant directed speech produced by mothers with symptoms of depression fails to promote associated learning in four-month old infants. *Child Development.*

Keltner, D. (1995). The signs of appeasement: Evidence for the distinct displays of embarrassment, amusement, and shame. *Journal of Personality and Social Psychology, 68,* 441–454.

Keltner, D., & Bonanno, G. A. (1997). A study of laughter and dissociation: The distinct correlates of laughter and smiling during bereavement. *Journal of Personality and Social Psychology, 73,* 687–702.

Keltner, D., & Buswell, B. N. (1997). Embarrassment: Its distinct form and appeasement functions. *Psychological Bulletin, 122,* 250–270.

Keltner, D., Ellsworth, P. C., & Edwards, K. (1993). Beyond simple pessimism: Effects of sadness and anger on social perception. *Journal of Personality and Social Psychology, 64,* 740–752.

Keltner, D., & Gross, J. J. (in press). Functional accounts of emotions. *Cognition and Emotion.*

Keltner, D., & Haidt, J. (1997). Social functions of emotions at multiple levels of analysis. Manuscript submitted for publication.

Keltner, D., Locke, K. D., & Audrain, P. C. (1993). The influence of attributions on the relevance of negative emotions to personal satisfaction. *Personality and Social Psychology Bulletin, 19,* 21–29.

Keltner, D., Moffitt, T., & Stouthamer-Loeber, M. (1995). Facial expressions of emotion and psychopathology in adolescent boys. *Journal of Abnormal Psychology, 104,* 644–652.

Keltner, D., Young, R., & Buswell, B. N. (1997). Appeasement in human emotion, personality, and social practice. *Aggressive Behavior, 23,* 359–374.

Keltner, D., Young, R. C., Oemig, C., Heerey, E., & Monarch, N. D. (in press). *Predictors and social consequences of teasing: Face threat and redressive action in hierarchical and intimate relations. Journal of Personality and Social Psychology.*

Kerr, S. & Neale, J. M. (1993). Emotion perception in schizophrenia: Specific deficit or further evidence for generalized poor performance? *Journal of Abnormal Psychology, 102,* 312–318.

King, S., & Dixon, M. J. (1996). The influence of expressed emotion, family dynamics, and symptom type on the social adjustment of schizophrenic young adults. *Archives of General Psychiatry, 53,* 1098–1104.

Klein, D. (1984). Depression and anhedonia. In D. C. Clark & J. Fawcett (Eds.), *Anhedonia and affect deficit states* (pp. 1–14). New York: PMA.

Klinnert, M., Campos, J., Sorce, J., Emde, R., & Svejda, M. (1983). Emotions as behavior regulators: Social referencing in infants. In R. Plutchik & H. Kellerman (Eds.), *Emotion theory, research, and experience: Vol. 2. Emotions in early development* (pp. 57–68). New York: Academic Press.

Knutson, B. (1996). Facial expressions of emotion influence interpersonal trait inferences. *Journal of Nonverbal Behavior, 20,* 165–182.

Krause, R., Steimer-Krause, E., & Hufnagel, H. (1992). Expression and experience of affects in paranoid schizophrenia. *Revue Européenne de Psychologie Appliquée, 42,* 131–138.

Krause, R., Steimer, E., Sanger-Alt, C., & Wagner, G. (1989). Facial expressions of schizophrenic patients and their interaction partners. *Psychiatry, 52,* 1–12.

Kring, A. M., & Bachorowski, J.-A. (in press). Emotion and psychopathology. *Cognition and Emotion.*

Kring, A. M., & Earnst, K. S. (1998). *Emotional responding in schizophrenia: Microexpressive facial activity and correspondence among emotion components.* Manuscript in preparation, Vanderbilt University.

Kring, A. M., Germans, M. K., & Earnst, K. S. (1997). *Heightened electrodermal reactivity to emotional stimuli is specific to a subgroup of schizophrenia patients.* Manuscript submitted for publication.

Kring, A. M., Kerr, S. L., Smith, D. A., & Neale, J. M. (1993). Flat affect in schizophrenia does not reflect diminished subjective experience of emotion. *Journal of Abnormal Psychology, 102,* 507–517.

Kring, A. M., & Neale, J. M. (1996). Do schizophrenics show a disjunctive relationship among expressive, experiential, and psychophysiological components of emotion? *Journal of Abnormal Psychology, 105,* 249–257.

Kruedelbach, N., McCormick, R. A., Schultz, S. C., & Grueneich, R. (1993). Impulsivity, coping styles, and triggers for craving in substance abusers with borderline personality disorder. *Journal of Personality Disorders, 7,* 214–222.

Lara, M. E., Leader, J., & Klein, D. N. (1997). The association between social support and course of depression: Is it confounded with personality? *Journal of Abnormal Psychology, 106,* 478–482.

Larsen, R. J., & Diener, E. (1992). Promises and problems with the circumplex model of emotion. *Review of Personality and Social Psychology, 13,* 25–59.

Lazarus, R. S. (1991). *Emotion and adaptation.* New York: Oxford University Press.

Leary, M., & Kowalski, R. M. (1995). *Social anxiety.* New York: Guilford Press.

LeDoux, J. (1996). *The emotional brain.* New York: Simon & Schuster.

Lerner, J., & Keltner, D. (1997). *The effects of fear and anger upon estimates of risk and loss.* Manuscript in preparation, University of California, Berkeley.

Levenson, R. W. (1992). Autonomic nervous system differences among emotions. *Psychological Science, 3,* 23–27.

Levenson, R. W., Carstenson, L., & Gottman, J. M. (1994). The influence of age and gender on affect, physiology, and their interrelations: A study of

long-term marriages. *Journal of Personality and Social Psychology, 67,* 56–68.

Levenson, R. W., Ekman, P., & Friesen, W. V. (1990). Voluntary facial action generates emotion-specific autonomic nervous system activity. *Psychophysiology, 27,* 363–384.

Levenson, R. W., & Gottman, J. M. (1983). Marital interaction: Physiological linkage and affective exchange. *Journal of Personality and Social Psychology, 45,* 587–597.

Levin, S., Hall, J. A., Knight, R. A., & Alpert, M. (1985). Verbal and nonverbal expression of affect in speech of schizophrenic and depressed patients. *Journal of Abnormal Psychology, 94,* 487–497.

Levine, D., Marziali, E., & Hood, J. (1997). Emotion processing in borderline personality disorders. *Journal of Nervous and Mental Disease, 185,* 240–246.

Liberman, R. P. (1982). Assessment of social skills. *Schizophrenia Bulletin, 8,* 62–84.

Liberman, R. P., DeRisi, W. J., & Mueser, K. T. (1989). *Social skills training for psychiatric patients.* New York: Pergamon Press.

Liebowitz, M. R. (1987). Social phobia. *Modern Problems in Pharmacopsychiatry, 22,* 141–173.

Linehan, M. M. (1987). Dialectical behavior therapy for borderline personality disorder. *Bulletin of the Menninger Clinic, 51,* 261–276.

Linszen, D. H., Dingemans, P. M., Annet Nugter, M., Van der Does, A. J. W., Scholte, W. F., & Lenior, M. A. (1997). Patients attributes and expressed emotion as risk factors for psychotic relapse. *Schizophrenia Bulletin, 23,* 119–130.

Lumsden, E. A. (1993). Borderline personality disorder: A consequence of experiencing affect within a truncated time frame? *Journal of Personality Disorders, 7,* 265–274.

Lutz, C. (1988). *Unnatural emotions.* Chicago: University of Chicago Press.

Lutz, C. A., & Abu-Lughod, L. (1990). *Language and the politics of emotion.* New York: Cambridge University Press.

Lutz, C., & White, G. (1986). The anthropology of emotions. *Annual Review of Anthropology, 15,* 405–436.

Mandler, G. (1975). *Mind and emotion.* New York: Wiley.

Marcus, D. K., & Wilson, J. R. (1996). Interpersonal perception of social anxiety: A social relations analysis. *Journal of Social and Clinical Psychology, 15,* 471–487.

Marks, T., & Hammen, C. L. (1982). Interpersonal mood induction: Situational and individual determinants. *Motivation and Emotion, 6,* 387–399.

Mattes, R. M., Schneider, F., Heimann, H., & Birbaumer, N. (1995). Reduced emotional response of schizophrenic patients in remission during social interaction. *Schizophrenia Research, 17,* 249–255.

Miklowitz, D. J. (1994). Family risk indicators in schizophrenia. *Schizophrenia Bulletin, 20,* 137–149.

Miklowitz, D. J., Goldstein, M. J., & Nuechterlein, K. H. (1995). Verbal interactions in the families of schizophrenic and bipolar affective patients. *Journal of Abnormal Psychology, 104,* 268–276.

Miller, R. S. (1987). Empathic embarrassment: Situational and personal determinants of reactions to the embarrassment of another. *Journal of Personality and Social Psychology, 53,* 1061–1069.

Miller, R. S., & Leary, M. R. (1992). Social sources and interactive functions of emotion: The case of embarrassment. In M. Clark (Ed.), *Emotion and social behavior* (pp. 202–221). Beverly Hills, CA: Sage.

Millon, T., & Davis, R. O. (1996). *Disorders of personality: DSM–IV and beyond* (2nd ed.). New York: Wiley.

Mineka, S., & Cook, M. (1993). Mechanisms involved in the observational conditioning of fear. *Journal of Experimental Psychology: General, 122,* 23–38.

Mineka, S., Davidson, M., Cook, M., & Keir, R. (1984). Observational conditioning of snake fear in Rhesus monkeys. *Journal of Abnormal Psychology, 93,* 355–372.

Modestin, J., & Villiger, C. (1989). Follow-up study on borderline versus nonborderline personality disorders. *Comprehensive Psychiatry, 30,* 236–244.

Monroe, S. M., Bromet, E. J., Connell, M. M., & Steiner, S. C. (1986). Social support, life events, and depressive symptoms: A one year prospective study. *Journal of Consulting and Clinical Psychology, 54,* 424–431.

Mueser, K. T., Bellack, A. S., Douglas, M. S., & Morrison, R. L. (1991). Prevalence and stability of social skills deficits in schizophrenia. *Schizophrenia Research, 5,* 167–176.

Mueser, K. T., Bellack, A. S., Morrison, R. L., & Wixted, J. T. (1990). Social competence in schizophrenia: Premorbid adjustment, social skill, and domains of functioning. *Journal of Psychiatric Research, 24,* 51–63.

Mueser, K. T., Doonan, R., Penn, D. L., Blanchard, J. J., Bellack, A. S., Nishith, P., & DeLeon, J. (1996). Emotion recognition and social competence in chronic schizophrenia. *Journal of Abnormal Psychology, 105,* 271–275.

Mueser, K. T., & Sayers, M. D. (1992). Social skills assessment. In D. J. Kavanagh (Ed.), *Schizophrenia: An overview and practical handbook* (pp. 182–204). London: Chapman & Hall.

Murray, I. R., & Arnott, J. L. (1993). Toward the simulation of emotion in synthetic speech: A review of the literature on human vocal emotion.

Journal of the Acoustical Society of America, 93, 1097–1108.

Nesse, R. M. (1990). Evolutionary explanations of emotions. *Human Nature, 1,* 261–289.

Nezlak, J. B., Imbrie, M., & Shean, G. D. (1994). Depression and everyday social interaction. *Journal of Personality and Social Psychology, 67,* 1101–1111.

Ohman, A. (1986). Face the beast and fear the face: Animal and social fears as prototypes for evolutionary analysis of emotion. *Psychophysiology, 23,* 123–145.

Ohman, A., & Dimberg, U. (1978). Facial expressions as conditioned stimuli for electrodermal responses: A case of "preparedness?" *Journal of Personality and Social Psychology, 36,* 1251–1258.

Owren, M. J., & Rendall, D. (in press). An affect-conditioning model of nonhuman primate vocal signaling. In N. S. Thompson (Series Ed.) & D. H. Owings & M. D. Beecher (Vol. Eds.), *Perspectives in ethology: Vol. 12. Communication.* New York, Plenum.

Paris, J. (1992). Social risk factors for borderline personality disorder: A review and hypothesis. *Canadian Journal of Psychiatry, 37,* 510–515.

Parker, G., & Hadzi-Pavolvic, D. (1990). Expressed emotion as a predictor of schizophrenic relapse: An analysis of aggregated data. *Psychological Medicine, 20,* 961–965.

Pelaez-Nogueras, M., Field, T., Cigales, M., Gonzalez, A., & Claskly, S. (1994). Infants of depressed mothers show less "depressed" behavior with their nursery teachers. *Infant Mental Health Journal, 15,* 358–367.

Pickens, J., & Field, T. (1993). Facial expressivity in infants of depressed mothers. *Developmental Psychology, 29,* 986–988.

Plutchik, R. (1993). Emotions and their vicissitudes: Emotions and psychopathology. In M. Lewis & J. M. Haviland (Eds.), *Handbook of emotions* (pp. 53–66). New York: Guilford Press.

Provine, R. R. (1992). Contagious laughter: Laughter is a sufficient stimulus for laughs and smiles. *Bulletin of the Psychonomic Society, 30,* 1–4.

Provine, R. R. (1993). Laughter punctuates speech: Linguistic, social, and gender contexts of laughter. *Ethology, 95,* 291–298.

Rauktis, M. E., Koeske, G. F., & Tereshko, O. (1995). Negative social interactions, distress, and depression among those caring for a seriously and persistently mentally ill relative. *American Journal of Community Psychology, 23,* 279–299.

Rothbart, M. L. (1973). Laughter in young children. *Psychological Bulletin, 80,* 247–256.

Russell, J. A. (1994). Is there universal recognition of emotion from facial expression? A review of cross-cultural studies. *Psychological Bulletin, 115,* 102–141.

Sacco, W. P., Milana, S., & Dunn, V. (1985). Effects of depression level and length of acquaintance on reactions of others to a request for help. *Journal of Personality and Social Psychology, 49,* 1728–1737.

Sack, A., Sperling, M., Fagen, G., & Foelsch, P. (1996). Attachment style, history, and behavioral contrasts for a borderline and normal sample. *Journal of Personality Disorders, 10,* 88–102.

Salem, J. E., Kring, A. M., & Kerr, S. L. (1996). More evidence for generalized poor performance in facial emotion perception in schizophrenia. *Journal of Abnormal Psychology, 105,* 480–483.

Scherer, K. R. (1986). Vocal affect expression: A review and model for future research. *Psychological Bulletin, 99,* 143–165.

Schlenker, B. R., & Leary, M. R. (1982). Social anxiety and self-presentation: A conceptualization and model. *Psychological Bulletin, 92,* 641–669.

Schwarz, N. (1990). Feelings as information: Informational and motivational functions of affective states. In E. T. Higgins & R. M. Sorrentino (Eds.), *Handbook of motivation and cognition, Volume 2* (pp. 527–561). New York: Guilford Press.

Seyfarth, R. M., & Cheney, D. L. (1990). *How monkeys see the world.* Chicago: University of Chicago Press.

Shearin, E. N., & Linehan, M. M. (1994). Dialectical behavior therapy for borderline personality disorder: Theoretical and empirical foundations. *Acta Psychiatrica Scandinavica, Supplementum, 379,* 61–68.

Simons, R. F., MacMillian, F. W., & Ireland, F. B. (1982). Anticipatory pleasure deficit in subjects reporting physical anhedonia: Slow cortical evidence. *Biological Psychology, 14,* 297–310.

Smith, D. A., Vivian, D., & O'Leary, K. D. (1990). Longitudinal prediction of marital discord from premarital expressions of affect. *Journal of Consulting and Clinical Psychology, 58,* 790–798.

Snyder, S., & Pitt, W. M. (1985). Characterizing anger in the *DSM–III* borderline personality disorder. *Acta Psychiatrica Scandinavica, 72,* 464–469.

Soloff, P. H. (1981). A comparison of borderline with depressed and schizophrenic patients on a new diagnostic interview. *Comprehensive Psychiatry, 22,* 291–300.

Soloff, P. H., & Millward, J. H. (1983). Developmental histories of borderline patients. *Comprehensive Psychiatry, 24,* 574–588.

Soloff, P. H., & Ulrich, R. F. (1981). Diagnostic interview for borderline patients: A replication study. *Archives of General Psychiatry, 38,* 686–692.

Solomon, R. C. (1990). *A passion for justice.* Reading, MA: Addison-Wesley.

Sorce, J. F., & Emde, R. N. (1981). Mother's presence is not enough: The effect of emotional availability

on infant exploration. *Developmental Psychology,* *17,* 737–745.

Tangney, J. P., Miller, R. S., Flicker, L., & Barlow, D. H. (1996). Are shame, guilt and embarrassment distinct emotions? *Journal of Personality and Social Psychology, 70,* 1256–1269.

Thorne, A. (1987). The press of personality: A study of conversations between introverts and extraverts. *Journal of Personality and Social Psychology, 53,* 718–726.

Tomarken, A. J., Davidson, R. J., Wheeler, R. E., & Doss, R. C. (1992). Individual differences in anterior brain asymmetry and fundamental dimensions of emotion. *Journal of Personality and Social Psychology, 62,* 676–687.

Tomarken, A. J., Elkins, L. E., Anderson, T., Shelton, R. E., & Hitt, S. (1997). *Sleep deprivation selectively potentiates positive affect during antidepressant treatment.* Manuscript submitted for publication.

Tomarken, A. J., Garber, J., & Simien, C. (1997). *Individual differences in resting frontal brain asymmetry predicts differential risk for depression among adolescents.* Manuscript in preparation.

Tomarken, A. J., & Keener, A. D. (in press). Frontal brain asymmetry and depression: A self-regulatory perspective. *Cognition and Emotion.*

Thoits, P. A. (1985). Self-labeling processes in mental illness: The role of emotional deviance. *American Journal of Sociology, 92,* 221–249.

Thoits, P. A. (1990). Emotional deviance: Research agendas. In T. Kemper (Ed.), *Research agendas in the sociology of emotions* (pp. 180–203). Albany, NY: SUNY Press.

Tooby, J., & Cosmides, L. (1990). The past explains the present: Emotional adaptations and the structure of ancestral environments. *Ethology and sociobiology, 11,* 375–424.

Trivers, R. L. (1971). The evolution of reciprocal altruism. *Quarterly Review of Biology, 46,* 35–57.

Tronick, E. Z. (1989). Emotions and emotional communication in infants. *American Psychologist, 44,* 112–119.

Tronick, E. Z., Als, H., Adamson, L., Wise, S., & Brazelton, T. B. (1978). The infant's response to entrapment between contradictory messages in face-to-face interaction. *Journal of American Academy of Child Psychiatry, 17,* 1–13.

Trull, T. J. (1995). Borderline personality disorder features in nonclinical young adults: 1. Identification and validation. *Psychological Assessment, 7,* 33–41.

Trull, T. J., Useda, J. D., Conforti, K., & Doan, B. T.

(1997). Borderline personality disorder features in nonclinical young adults: 2. Two-year outcome. *Journal of Abnormal Psychology, 106,* 307–314.

Ulrich, G., & Harms, K. (1985). A video analysis of the nonverbal behavior of depressed patients and their relation to anxiety and depressive disorders. *Journal of Affective Disorders, 9,* 63–67.

Walden, T. A., & Ogan, T. A. (1988). The development of social referencing. *Child Development, 59,* 1230–1240.

Wallace, S. T., & Alden, L. E. (1997). Social phobia and positive social events: The price of success. *Journal of Abnormal Psychology, 106,* 416–424.

Walster, E., Walster, G. W., & Berscheid, E. (1978). *Equity: Theory and research.* Boston: Allyn & Bacon.

Watson, D. (1988). Intraindividual and interindividual analyses of positive and negative affect: Their relation to health complaints, perceived stress, and daily activities. *Journal of Personality and Social Psychology, 62,* 489–505.

Watson, D., Clark, L. A., & Carey, G. (1988). Positive and negative affectivity and their relation to anxiety and depressive disorders. *Journal of Abnormal Psychology, 97,* 346–353.

Watson, D., Clark, L. A., McIntyre, C. W., & Hamaker, S. (1992). Affect, personality, and social activity. *Journal of Personality and Social Psychology, 63,* 1011–1025.

Waxer, P. H. (1974). Nonverbal cues for depression. *Journal of Abnormal Psychology, 83,* 319–322.

White, G. M. (1990). Moral discourse and the rhetoric of emotions. In C. A. Lutz & L. Abu-Lughod (Eds.), *Language and the politics of emotion* (pp. 46–68). New York: Cambridge University Press.

Youngren, M. A., & Lewinsohn, P. M. (1980). The functional relationship between depression and problematic behavior. *Journal of Abnormal Psychology, 89,* 333–341.

Zahn-Waxler, C., & Radke-Yarrow, M. (1982). The development of altruism: Alternative research strategies. In N. Eisenberg (Ed.), *The development of prosocial behavior* (pp. 109–138). New York: Academic Press.

Zeskind, P. S., & Lester, B. M. (1978). Acoustic features and auditory perceptions of the cries of newborns with prenatal and perinatal complications. *Child Development, 49,* 580–589.