

Emotion Dysregulation in Generalized Anxiety Disorder: A Comparison with Social Anxiety Disorder¹

Cynthia L. Turk,^{2,3} Richard G. Heimberg,^{2,6} Jane A. Luterek,²
Douglas S. Mennin,⁴ and David M. Fresco⁵

From an emotion regulation framework, generalized anxiety disorder (GAD) can be conceptualized as a syndrome involving heightened intensity of subjective emotional experience, poor understanding of emotion, negative reactivity to emotional experience, and the use of maladaptive emotion management strategies (including overreliance on cognitive control strategies such as worry). The current study sought to replicate previous findings of emotion dysregulation among individuals with GAD and delineate which aspects of emotion dysregulation are specific to GAD or common to GAD and another mental disorder (social anxiety disorder). Individuals with GAD reported greater emotion intensity and fear of the experience of depression than persons with social anxiety disorder and nonanxious control participants. Individuals with social anxiety disorder indicated being less expressive of positive emotions, paying less attention to their emotions, and having more difficulty describing their emotions than either persons with GAD or controls. Measures of emotion differentiated GAD, social anxiety disorder, and normal control groups with good accuracy in a discriminant function analysis. Findings are discussed in light of theoretical and treatment implications for both disorders.

KEY WORDS: generalized anxiety disorder; social anxiety disorder; emotion regulation.

Our theoretical model of generalized anxiety disorder (GAD) emphasizes the importance of understanding worry, the central feature of GAD, in the context of difficulties in emotion regulation that may motivate its use (Mennin, Heimberg, Turk, & Fresco, 2002; Mennin, Turk, Heimberg, & Carmin, 2004). It builds upon

¹An earlier version of this paper was presented at the Association for Advancement of Behavior Therapy, Reno, NV, November, 2002.

²Adult Anxiety Clinic of Temple, Department of Psychology, Temple University, Pennsylvania.

³Department of Psychology, La Salle University, Pennsylvania.

⁴Department of Psychology, Yale University, New Haven, Connecticut.

⁵Department of Psychology, Kent State University, Kent, Ohio.

⁶Correspondence should be directed to Richard G. Heimberg, Adult Anxiety Clinic of Temple, Department of Psychology, Temple University, Weiss Hall, 1701 North 13th Street, Philadelphia, Pennsylvania 19122-6085; e-mail: heimberg@temple.edu.

the growing body of research examining the relationship between worry and emotional arousal. One line of research suggests that worry is more characterized by thoughts than images (e.g., Borkovec & Lyonfields, 1993; Borkovec & Inz, 1990; Freeston, Dugas, & Ladouceur, 1996). This finding is important because thinking about emotional material leads to very little physiological arousal, while visualizing images of that same emotional material leads to significant physiological response (Vrana, Cuthbert, & Lang, 1986). Additionally, worry has been shown to be associated with reduced autonomic arousal upon exposure to images containing feared material (e.g., Borkovec & Hu, 1990), and GAD is associated with a restricted range of variability on measures such as skin conductance and heart rate (Hoehn-Saric & McLeod, 1988; Hoehn-Saric, McLeod, & Zimmerli, 1989). Borkovec, Alcaine, and Behar (2004) synthesize these findings by suggesting that worry allows the individual to process emotional material at an abstract, conceptual level and avoid aversive images, autonomic arousal, and intense negative emotions in the short-run. Consistent with models of emotional processing (e.g., Foa & Kozak, 1986), the short-term avoidance provided by worry carries with it the cost of symptoms associated with inadequate emotional processing, such as more frequent intrusive images about the initial source of upset (e.g., Butler, Wells, & Dewick, 1995; Wells & Papageorgiou, 1995).

Worry and emotional arousal interact in a dynamic process that unfolds over time. From this perspective, it is too simplistic to merely categorize individuals with GAD as either emotionally blunted or excessively aroused. Indeed, the literature suggests that individuals with GAD frequently endorse symptoms of autonomic arousal (e.g., Brown, Marten, & Barlow, 1995; Butler, Fennell, Robson, & Gelder, 1991). However, as noted earlier, worry, the central feature of GAD, has been associated with decreased autonomic arousal. Brown, Chorpita, and Barlow (1998) reconciled these apparently contradictory findings based on structural equation modeling suggesting that GAD is associated with high levels of negative affect, which is, in turn, associated with increased autonomic arousal. However, after accounting for variance in anxious arousal due to negative affect, worry was associated with suppression of autonomic arousal.

In our model of GAD (see Mennin et al., 2002; 2004), we attempt to simultaneously capture both the excessive negative affect and affect-dampening worry processes that characterize GAD. We argue that emotional experience may become dysregulated through a set of processes that involve 1) heightened intensity of emotional experience; 2) poor understanding of emotions (e.g., relative inability to identify discrete emotions and use them as a source of knowledge); 3) negative reactivity to one's emotional state (e.g., fear of emotion); and 4) maladaptive emotional management responses.

We have suggested that individuals with GAD have emotional reactions that occur more easily, quickly, and intensely than is the case for most other people (i.e., heightened emotional intensity). They may frequently experience strong negative affect, which may be elicited by situations that are not as evocative for other people. Consistent with the research showing that higher levels of emotional intensity are associated with greater emotion expressivity (Gross & John, 1997), individuals with GAD may also express more of their emotions, especially negative

emotions, than most other people. Being overly expressive of negative emotions on a regular basis may lead to criticism or rejection by others, which, in turn, may elicit high levels of negative affect. Research suggests that individuals with GAD perceive their relationships with family, friends, and romantic partners as moderately to severely impaired (Turk, Mennin, Fresco, & Heimberg, 2000), and evidence is mounting that individuals with GAD may have interpersonal styles that contribute to the relationship problems that they perceive. Pincus and Borkovec (1994) and Eng and Heimberg (in press) found that the majority of individuals with GAD endorsed interpersonal styles that were best characterized as overly nurturant and intrusive. Other individuals with GAD were best characterized as socially avoidant/nonassertive or cold/vindictive.

Individuals with GAD may also have difficulty identifying primary emotions such as anger, sadness, fear, disgust, and joy, and instead experience their emotions as undifferentiated, confusing, and overwhelming (i.e., poor understanding of emotions). In this way, persons with GAD fail to access and utilize the adaptive information conveyed by their emotions. Given strong emotional responses and a poor understanding of them, individuals with GAD may experience emotions as aversive and become anxious when they occur (i.e., negative reactivity to emotions).

We also hypothesize that individuals with GAD have difficulty knowing when or how to enhance or diminish the intensity of their emotional experience in a manner that is appropriate for the environmental context (i.e., maladaptive emotional management). Given the salience of their emotion and both their lack of skills for utilizing emotions and their negative reactions to them, we suggest that individuals with GAD turn to a variety of maladaptive management approaches. These may take the form of poor modulation of emotional episodes or the rigid control of emotional experience, including excessive reliance on worry to avoid a perceived aversive state. In the latter scenario, rather than processing the emotion associated with the event (Foa & Kozak, 1986), the individual with GAD turns to worry or some other maladaptive coping response (e.g., reassurance seeking) to avoid or dampen the original affect.

A series of three studies provided the initial test of this emotion dysregulation model of GAD (Mennin, Heimberg, Turk, & Fresco, in press). In the first study, college students with and without GAD (as assessed by self-report; Newman et al., 2002) were compared on their responses to a battery of measures assessing aspects of emotion. Individuals with self-reported GAD endorsed greater intensity of emotional experience and expressed more negative, but not positive, emotions than did controls. They also endorsed marked difficulties in their ability to identify and describe their emotional experience. Further, the analogue GAD group also displayed more negative beliefs about their emotional reactions (including anxious, depressed, angry and elating mood states) and their consequences, compared to the control group. They also reported greater difficulty repairing negative mood states than the control group. Using the linear combination of emotion measures derived from a discriminant function analysis, 72% of individuals with GAD and 76% of individuals without GAD were correctly classified. Furthermore, a composite factor score of emotion measures significantly predicted the presence of GAD, controlling for worry, trait anxiety, and depression. These results were encouraging, given that

none of the emotion measures included items reflecting the symptoms of GAD. In our second study, these findings were largely replicated with a sample of treatment-seeking individuals with a principal diagnosis of GAD and a comparison group of individuals from the community with no current Axis I diagnosis (Mennin et al., in press). In the third study, college students with and without GAD (as assessed by self-report; Newman et al., 2002) underwent a mood induction (Mennin et al., in press). Following induction of a negative mood, controls reported greater clarity about what they were feeling, more acceptance of these emotions, and a greater belief that they could influence this mood state than individuals with GAD. These findings did not appear to be due to an increased familiarity with negative mood states in the GAD group as the groups did not differ on typicality of the induced mood.

Recently, Roemer, Salters, Raffa, and Orsillo (2005) conducted a study of relevance to our emotion dysregulation model of GAD. Specifically, fear of internal experiences and fear of losing control over one's emotions were each uniquely associated with the severity of GAD symptoms, above and beyond their association with chronic worry.

Although these initial findings are intriguing, a limitation is that only GAD and nonanxious control groups have been examined in research to date. An alternative explanation remains, which is that the pattern of emotion dysregulation observed in previous research might have been observed in any clinical sample. Contrary to this position, we hypothesize that different mental disorders exhibit some commonalities but also disorder-specific difficulties in how emotions are typically regulated. To test this hypothesis, we compared the responses of participants with GAD to those of participants with another anxiety disorder on the battery of emotion measures used in our earlier research. Social anxiety disorder, which is characterized by the fear of negative evaluation and fear and avoidance of one or more social situations, was chosen for this purpose. Social anxiety disorder and GAD have several commonalities. Worry is the central feature of GAD, and pathological worry is elevated among individuals with social anxiety disorder (Brown, Antony, & Barlow, 1992). Social anxiety disorder is characterized by interpersonal concerns, and significant disability in interpersonal relationships is common (e.g., Schneier et al., 1994). Similarly, evidence is mounting that interpersonal difficulty and disability are characteristic of patients with GAD (Borkovec, Shadick, & Hopkins, 1991; Breitholtz, Westling, & Öst, 1998; Eng & Heimberg, in press; Turk et al., 2000). The high degree of overlap between the features, symptoms, and concerns of individuals with GAD and social anxiety disorder provides a rigorous test of the ability of emotion measures to differentiate these disorders.

METHOD

Participants

Participants were 766 undergraduate students (538 women) who took part in the study for course credit. The racial composition of the sample was 44% Caucasian, 29% African American, 8% Asian/Asian American, 3% Hispanic, 6% mixed

racial heritage, and 9% individuals who endorsed “other.” The average age of participants was 19.5 years ($SD = 4.1$).

Diagnostic and Symptom Measures

The Generalized Anxiety Disorder Questionnaire—IV (GAD-Q-IV; Newman et al., 2002) is a self-report measure assessing DSM-IV (American Psychiatric Association [APA], 1994) criteria for GAD. The original version of this scale (GAD-Q; Roemer, Borkovec, Posa, & Borkovec, 1995) was scored by comparing individual items to specific DSM-III-R (APA, 1987) criteria for GAD. In contrast, Newman et al. (2002) recommend using a dimensional scoring system (range 0–13) with cut-off scores to determine presence or absence of GAD. Thus, an individual may fail to endorse an item on the GAD-Q-IV required by DSM-IV criteria (e.g., excessive worries more days than not during the past 6 months) but still receive a diagnosis of GAD. Newman et al. (2002) identified a cutoff score of 5.7 as achieving the optimal balance between sensitivity and specificity. With this cutoff score, Newman et al. (2002) found good agreement between the GAD-Q-IV and clinician diagnosis based on the anxiety disorders interview schedule for DSM-IV (ADIS-IV; Brown, DiNardo, & Barlow, 1994) or the anxiety disorders interview schedule for DSM-IV: lifetime version (ADIS-IV-L; DiNardo, Brown, & Barlow, 1994), $kappa = .67$, with 88% of clinician-diagnosed participants correctly classified. In the current study, a cutoff score of 5.7 resulted in 33% of the sample being classified as positive for GAD. Matching item responses to specific DSM-IV criteria, as was done for the original version of the scale, resulted in a more modest 14.5% of the sample being classified as positive for GAD. The discrepancy between the two scoring systems was due to the fact that the cutoff score of 5.7 identified 146 more cases of GAD than the criterion-based scoring system. The criterion-based scoring system did not classify any participant as having GAD that the cutoff score system did not. Therefore, the more conservative criterion-based scoring system was used in this study.

The Social Interaction Anxiety Scale (Mattick & Clarke, 1998) is a 20-item self-report measure that assesses anxiety experienced in dyadic and group interactions. The SIAS has been widely used in the assessment of social anxiety and has evidenced good reliability and validity in a number of studies (for reviews see Hart, Jack, Turk, & Heimberg, 1999, or Heimberg & Turk, 2002). Heimberg, Mueller, Holt, Hope, and Liebowitz (1992) found that a cut-off score of 34 on the SIAS classified 82% of patients with social anxiety disorder and 82% of community controls into the correct group. This cut-off was cross-validated by Brown et al. (1997).

The Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990) is a 16-item inventory designed to capture the generality, excessiveness, and uncontrollability characteristic of pathological worry. Multiple studies attest to the validity of the PSWQ, as well as to its good internal consistency and test-retest reliability (for a review see Molina & Borkovec, 1994, or Turk, Heimberg, & Mennin, 2004).

Emotion Measures

The Affective Control Scale (Williams, Chambless, & Ahrens, 1997) is a 48-item self-report measure assessing negative beliefs about emotional reactions centering on fear of emotions and inability to control emotional experience. Subscales include 1) fear of anxiety (e.g., "Once I get nervous, I think that my anxiety might get out of hand"); 2) fear of depression (e.g., "Depression could really take me over, so its important to fight off sad feelings"); 3) fear of anger (e.g., "I am afraid that I will hurt someone if I get really furious"); and 4) fear of positive emotions (e.g., "Being filled with joy sounds great, but I am concerned that I could lose control over my actions if I get too excited"). The subscales have demonstrated satisfactory internal consistency (Berg, Shapiro, Chambless, & Ahrens, 1998; Williams et al., 1997). The ACS total score is strongly correlated with neuroticism and emotional control and minimally correlated with social desirability (Berg et al., 1998; Williams et al., 1997).

The Toronto Alexithymia Scale-20 (TAS-20; Bagby, Parker, & Taylor, 1994a; Bagby, Taylor, & Parker, 1994b) is a 20-item self-report measure that generates three factor-analytically derived subscales including 1) difficulty identifying feelings (e.g., "When I am upset, I don't know if I am sad, frightened, or angry"); 2) difficulty describing feelings (e.g., "It is difficult for me to find the right words for my feelings"), and 3) externally oriented thinking. The externally oriented thinking subscale was not used in this study. The factor scores have evidenced acceptable internal consistency (Bagby et al., 1994a). As expected, TAS-20 factor scores correlate negatively with measures assessing access to one's feelings and openness to feelings (Bagby et al., 1994b).

The Trait Meta-Mood Scale (Salovey, Mayer, Goldman, Turvey, & Palfai, 1995) is a 30-item self-report measure of emotional intelligence that is comprised of three factor-analytically derived subscales: 1) attention to emotion (e.g., "I pay a lot of attention to how I feel"); 2) clarity of emotions (e.g., "I am usually very clear about my feelings"); and 3) mood repair (e.g., "When I become upset I remind myself of all the pleasures in life"). Preliminary studies suggest that these subscales are internally consistent and related to other measures of mood and mood management (Salovey et al., 1995).

The *Berkeley Expressivity Questionnaire* (BEQ; Gross & John, 1997) is a 16-item self-report measure that assesses both the strength of emotional response tendencies and the degree to which these emotional impulses are expressed overtly. It is comprised of three factor-analytically derived subscales: 1) impulse strength (e.g., "My body reacts very strongly to emotional situations"); 2) negative expressivity (e.g., "Whenever I feel negative emotions, people can easily see exactly what I am feeling"); and 3) positive expressivity (e.g., "When I'm happy, my feelings show"). The BEQ subscales have been shown to have adequate internal consistency and retest reliability (Gross & John, 1997).

Procedure

The GAD-Q-IV, SIAS, PSWQ, and emotion measures were administered as part of a larger questionnaire battery given to introductory psychology students

during the first week of the semester. Participants took the questionnaire packets home and returned them the following week.

The GAD group was comprised of 68 individuals (60 women) meeting DSM-IV criteria for GAD based on the items that they endorsed on the GAD-Q-IV. The social anxiety disorder group consisted of 105 individuals (66 women) with scores greater than or equal to 34 on the SIAS. Individuals meeting criteria for both GAD and social anxiety disorder ($n = 43$) were excluded from analyses. The remaining 550 individuals (369 women) who did not meet criteria for GAD or social anxiety disorder served as normal controls.

Analysis Plan for the Emotion Measures

Measures of emotion were grouped to represent each of the components of the model, including 1) heightened emotional intensity (i.e., BEQ impulse strength, BEQ negative expressivity and BEQ positive expressivity); 2) poor understanding of emotions (i.e., TMMS clarity of emotions, TAS difficulty identifying emotions, TAS difficulty describing emotions); 3) negative reactivity to one's emotional state (i.e., TMMS attention to emotions; ACS fear of anxiety, ACS fear of depression, ACS fear of anger, ACS fear of positive emotions); and 4) maladaptive emotional management responses (i.e., TMMS mood repair). Emotional expressivity can be seen as an instrumental act (e.g., to elicit reassurance or comfort from others) or an unintentional reflection of emotional intensity (e.g., facial expression of wide eyes and a broad smile associated with a strong feeling of joy). The BEQ taps the latter of these types of expressivity. Hence, the BEQ expressivity subscales were considered measures of heightened emotional intensity rather than maladaptive emotional management responses.

ANOVAs utilizing planned non-orthogonal contrast tests were used to understand the nature of the differences among the three groups (GAD, social anxiety disorder, and control) for each measure of emotion within each domain. Bonferroni correction was applied to the analyses in each domain with multiple indices to control for alpha inflation. Cohen's d is reported for tests of the main hypotheses to address Type II error ($d = .20$ for small effect, $d = .50$ for a medium effect, $d = .80$ for a large effect). A discriminant function analysis was conducted in which the emotion measures were used to predict group membership and determine which variables were most important in making that discrimination.

RESULTS

Preliminary Analyses

As expected, the GAD group achieved a significantly higher PSWQ score than the social anxiety disorder group, which had a significantly higher score than the control group (see Table I). This pattern of differences was replicated with the GAD-Q-IV dimensional score. The group with social anxiety disorder had a

Table I. Group Differences in Measures of Worry, Social Anxiety, and Symptoms of Generalized Anxiety Disorder (GAD)

	Groups			<i>F</i>
	GAD Mean (<i>SD</i>)	Social anxiety Mean (<i>SD</i>)	Control Mean (<i>SD</i>)	
Penn State Worry Questionnaire	63.46 (11.49) a	50.77 (11.39) b	44.80 (12.74) c	<i>F</i> (2,718) = 72.5*
GAD-Q-IV dimensional score	10.27 (1.25) a	5.80 (2.37) b	4.51 (2.48) c	<i>F</i> (2,720) = 181.3*
Social Interaction Anxiety Scale	19.25 (7.88) b	42.13 (6.85) a	16.57 (8.32) c	<i>F</i> (2,720) = 442.0*

Note. *N* varies between 721 and 723 due to missing data. GAD-Q-IV: Generalized Anxiety Disorder Questionnaire-IV. Significant group differences according to follow-up tests are indicated by different alphabets on the baseline.

* $p < .001$.

significantly higher SIAS score than the GAD group, which had a significantly higher score than the control group.

Sex differences were observed among GAD, social anxiety, and normal control groups, $\chi^2(2, N = 723) = 13.58, p < .001$. Specifically, the GAD group consisted of significantly fewer men than either the social anxiety group [$\chi^2(1, N = 173) = 13.43, p < .001$] or the control group [$\chi^2(1, N = 618) = 10.99, p < .001$]. No sex differences were observed between the social anxiety group and the control group, $\chi^2(1, N = 655) = 1.48, p = \text{ns}$.

Sex differences among men and women on the emotion variables may influence the interpretation of between-group differences. Therefore, a series of independent-sample *t*-tests was conducted comparing men and women on each of the emotion variables. No significant differences between men and women emerged for TMMS negative mood repair, TMMS clarity of emotions, TAS difficulty identifying emotions, TAS difficulty describing emotions, ACS fear of depression, and ACS fear of anxiety. However, relative to men, women indicated greater attention to emotions, emotion impulse strength, negative expressivity, and positive expressivity. Men endorsed more fear of anger and more fear of positive emotions than women. Given these differences, for these variables, 3 (group: GAD, social anxiety, control) \times 2 (sex: men, women) ANOVAs were conducted to determine whether there was an interaction between group and sex. No significant interactions were observed.

Heightened Emotional Intensity

As mentioned earlier, measures of emotional intensity consisted of the BEQ impulse strength, BEQ negative expressivity, and BEQ positive expressivity scales. A Bonferonni correction was made for the multiple tests conducted in this domain ($p = .05/3 = .016$).

Significant differences among groups were observed for all measures. However, differences on BEQ negative expressivity were no longer significant after Bonferonni adjustment (see Table II). Planned nonorthogonal contrasts revealed that, as assessed by the BEQ impulse strength scale, individuals with GAD reported experiencing their emotions more intensely than either socially anxious individuals ($d = .47$) or controls ($d = .55$). Socially anxious individuals and controls did not

Table II. Group Differences in Deficits in Emotion Intensity and Understanding of Emotions

	Groups			<i>F</i>
	GAD Mean (<i>SD</i>)	Social anxiety Mean (<i>SD</i>)	Control Mean (<i>SD</i>)	
Heightened emotional intensity				
BEQ impulse strength	5.29 (.84) a	4.48 (.84) b	4.48 (1.09) b	<i>F</i> (2,720) = 19.2*
BEQ negative expressivity	4.15 (.90)	3.81 (.73)	3.96 (.85)	<i>F</i> (2,720) = 3.4 [†]
BEQ positive expressivity	5.34 (.99) a	4.75 (.84) b	5.20 (1.05) a	<i>F</i> (2,719) = 9.5*
Poor understanding of emotions				
TMMS clarity of emotions	3.08 (.59) b	3.03 (.51) b	3.45 (.56) a	<i>F</i> (2,713) = 33.8*
TAS difficulty identifying emotions	17.12 (5.17) a	18.30 (5.51) a	13.95 (5.36) b	<i>F</i> (2,718) = 35.4*
TAS difficulty describing emotions	13.93 (4.71) b	16.28 (4.12) a	12.44 (4.37) c	<i>F</i> (2,718) = 34.9*

Note. *N* varies between 716 and 723 due to missing data. BEQ: Berkeley Expressivity Questionnaire; TAS: Toronto Alexithymia Scale-20 item version; TMMS: Trait Meta Mood Scale. Significant group differences according to follow-up tests are indicated by different alphabets on the baseline.

* $p < .001$. [†] $p < .05$, not significant after Bonferroni correction.

differ from each other ($d = .00$). Socially anxious individuals reported being less expressive of positive emotions than individuals with GAD ($d = .27$) and controls ($d = .29$). These latter two groups did not differ on this measure ($d = .08$). Although only significant before alpha correction, individuals with GAD reported being more expressive of their negative emotions than individuals with social anxiety disorder ($d = .19$). Neither the GAD ($d = .13$) nor the social anxiety group ($d = .12$) differed from the control group on this measure.

Our model suggests that higher levels of emotion intensity should elicit greater use of worry as a control strategy. Consistent with this prediction, the PSWQ was significantly and positively correlated with BEQ impulse strength, $r = .35$, $p < .001$. A small but significant correlation was observed between worry and negative expressivity ($r = .14$, $p < .001$); however, the correlation between worry and positive expressivity was not significant ($r = .06$, $p > .09$).

Poor Understanding of Emotions

Measures of deficits in understanding emotions consisted of the following scales: TMMS clarity of emotions, TAS difficulty identifying emotions, and TAS difficulty describing emotions. A Bonferroni correction was made for the multiple tests conducted in this domain ($p = .05/3 = .016$). Significant differences among groups were observed for all measures (see Table II). Planned non-orthogonal contrasts revealed that individuals with GAD and individuals with social anxiety disorder were less clear about what emotions they were experiencing than controls ($d = .39$ vs. GAD and $d = .53$ vs. social anxiety disorder). Individuals with GAD and individuals with social anxiety disorder did not differ from each other in terms of emotional clarity ($d = 0.04$). Both GAD ($d = 0.35$) and social anxiety disorder ($d = .55$) groups reported more difficulty identifying their emotions than control individuals but did not differ from each other ($d = .09$). Lastly, individuals with GAD had more difficulty describing their emotions than controls ($d = .20$). Individuals with social

Table III. Group Differences in Negative Reactivity to Emotions and Maladaptive Emotion Management Responses

	Groups			<i>F</i>
	GAD Mean (<i>SD</i>)	Social anxiety Mean (<i>SD</i>)	Control Mean (<i>SD</i>)	
Negative reactivity to emotions				
TMMS attention to emotions	3.89 (.54) a	3.55 (.51) b	3.78 (.56) a	<i>F</i> (2,713) = 9.7*
ACS fear of anxiety	3.86 (.76) a	3.68 (.64) a	3.04 (.82) b	<i>F</i> (2,716) = 54.6*
ACS fear of depression	3.87 (1.07) a	3.55 (.94) b	2.98 (1.02) c	<i>F</i> (2,714) = 32.9*
ACS fear of anger	3.80 (.98) a	3.82 (.75) a	3.39 (.79) b	<i>F</i> (2,715) = 18.2*
ACS fear of positive emotions	3.23 (.87) a	3.34 (.69) a	2.92 (.76) b	<i>F</i> (2,715) = 16.9*
Maladaptive emotion management				
TMMS mood repair	3.25 (.77) b	3.20 (.73) b	3.58 (.74) a	<i>F</i> (2,715) = 14.9*

Note. *N* varies between 716 and 719 due to missing data. TMMS: Trait Meta Mood Scale; ACS: Affective Control Scale. Significant group differences according to follow-up tests are indicated by different alphabets on the baseline.

* $p < .001$.

anxiety disorder had greater difficulty describing their emotions than individuals with GAD ($d = .24$) or controls ($d = .60$). Higher levels of worry were also associated with less emotional clarity ($r = -.27, p < .001$) and more difficulty identifying ($r = .25, p < .001$) and describing emotions ($r = .15, p < .001$).

Negative Reactivity to Emotions

Measures of negative reactivity to emotions included the TMMS attention to emotions, ACS fear of anxiety, ACS fear of depression, ACS fear of anger, and ACS fear of positive emotions subscales. A Bonferonni correction was made for the multiple tests conducted in this domain ($p = .05/5 = .01$). As shown in Table III, the anxiety groups did not differ in fear of anxiety ($d = .13$), anger ($d = .02$), or positive emotions ($d = .08$). Individuals with GAD reported more fear of depression than individuals with social anxiety disorder ($d = .15$). Individuals in the GAD group scored significantly greater than did controls on fear of anxiety ($d = .62$), depression ($d = .51$), anger ($d = .29$), and positive emotion ($d = .22$). Similarly, individuals in the social anxiety group scored significantly greater than controls on fear of anxiety ($d = .66$), depression ($d = .39$), anger ($d = .38$), and positive emotion ($d = .38$). Individuals with social anxiety disorder reported paying less attention to emotions than either individuals with GAD ($d = .29$) or controls ($d = .29$). However, the GAD group did not differ from the control group on attention to emotions ($d = .12$).

Higher levels of worry were associated with higher scores on all subscales of the ACS ($r = .12-.38$, all $p < .001$). A small but significant correlation was also observed between worry and attention to emotions, $r = .11, p < .004$.

Maladaptive Emotional Management

Ability to manage emotions was measured by the TMMS mood repair subscale. Individuals with GAD and social anxiety disorder reported similar ability to repair a

negative mood state ($d = .03$), significantly less than controls ($d = .25$ vs. GAD and $d = .35$ vs. social anxiety disorder) (Table III). Lastly, higher levels of worry were associated with less ability to repair a negative mood state, $r = -.21, p < .001$.

Prediction of Group Membership

Discriminant function analysis successively identifies the linear combinations of variables (canonical discriminant functions) that maximize separation among groups (Duarte Silva & Stam, 1995). Two canonical discriminant functions produced good discrimination among the three groups according to Wilk’s lambda statistic ($p < .001$). The emotion scales most strongly correlated with the first canonical discriminant function (as determined by $r > .50$) were ACS fear of anxiety ($r = .80$), TMMS clarity of emotions ($r = -.64$), TAS difficulty identifying emotions ($r = .62$), and ACS fear of depression ($r = .62$). The emotion scales most strongly correlated with the second canonical discriminant function were BEQ emotion impulse strength ($r = .67$), TMMS attention to emotions ($r = .58$), TAS difficulty describing emotions ($r = -.58$), and BEQ positive expressivity ($r = .54$). The mean scores of the unstandardized canonical discriminant functions for each group are plotted in the discriminant space in Figure 1. Figure 1 makes apparent that the first canonical dimension accounts for most of the mean difference between the control group and the anxiety groups. Additionally, Figure 1 also suggests that the second discriminant function is the primary contributor to the separation of the two anxiety groups from each other. The discriminant analysis accurately classified 46 of 67 (69%) individuals with GAD, 60 of 102 (59%) individuals with social anxiety disorder, and 311 of 540 (58%) controls.

DISCUSSION

We have argued that heightened emotional intensity coupled with poor understanding of emotions and discomfort with emotional experience may lead

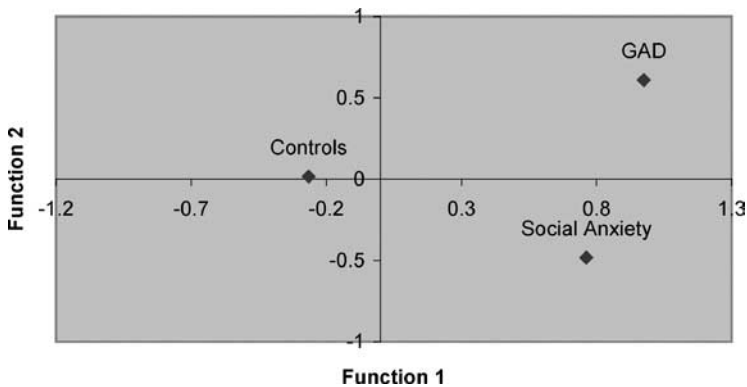


Fig. 1. The mean scores of the two unstandardized canonical discriminant functions for the generalized anxiety disorder (GAD) group, social anxiety group, and normal control group plotted in the discriminant space.

individuals with GAD to use maladaptive coping strategies to manage this aversive state. The present investigation examined whether deficits in this emotion regulatory process are specific to GAD or may be present in other conditions, such as social anxiety disorder. Individuals with GAD reported greater emotion impulse strength than either controls or persons with social anxiety disorder. Further, the experience of greater emotional intensity was associated with greater motivation to engage in maladaptive strategies (e.g., worry) to control emotions.

Despite their perception that they experience emotions strongly, individuals with GAD were not more expressive of their emotions and were not more attentive to their emotions than controls. The differences between individuals with GAD and individuals with social anxiety disorder in these areas were more the result of deficits among persons with social anxiety disorder than excesses among persons with GAD. In previous research, we had found that individuals with GAD were more expressive of negative emotions than controls (Mennin et al., in press). Although worry was positively correlated with negative expressivity and the group means were in the expected direction, this study failed to find a (Bonferroni-corrected) significant difference. The reasons for this failure to replicate are not clear, and additional research is needed to reconcile these results.

Individuals with GAD indicated greater deficits than controls on most measures assessing poor understanding of emotions and negative reactivity to emotions. However, individuals with GAD were generally not more impaired in these domains than individuals with social anxiety disorder. The one exception to this pattern was that individuals with GAD reported more fear of and beliefs about the importance of controlling depression than individuals with social anxiety disorder. Therefore, we have only limited evidence that individuals with GAD are more fearful of experiencing emotions than individuals with social anxiety disorder; rather, both of these anxiety disorder groups seem to be fearful of experiencing emotions. Consistent with our findings, Roemer and colleagues (2005) found that fear of depression was positively associated with worry and GAD severity. Additionally, previous findings that individuals with GAD have impairments in identifying emotions, clarifying the information that emotions convey, and describing emotions to others were replicated (Mennin et al., in press), but these deficits do not appear to be unique to GAD. The finding that socially anxious participants experience deficits in identifying and describing emotions has been observed in previous research (Cox, Swinson, Shulman, & Bourdeau, 1995; Fukunishi, Kikuchi, Wogan, & Takubo, 1997).

Ability to identify discrete emotional experiences has been shown to be associated with recovery from an induced negative mood (Salovey et al., 1995) and increased regulation of negative emotions using a range of strategies (Feldman-Barrett, Gross, Conner-Christensen, & Benvenuto, 2001). Individuals with GAD and individuals with social anxiety disorder may both benefit from learning to better identify and differentiate their emotions. Knowing how one feels provides an additional source of information about the nature of the current situation, what to do next, and available options for modifying one's emotions (Feldman-Barrett et al., 2001). Therefore, training in skills for identifying and differentiating emotions, in addition to traditional cognitive behavioral techniques, may positively affect the deficits in repairing negative mood states observed in both anxiety groups.

Individuals in both anxiety groups, but especially individuals with social anxiety disorder, may also benefit from practice describing their emotions to others.

The emotion measures, which contain no items assessing diagnostic criteria for either disorder, were able to differentiate among the three groups (GAD, social anxiety, control) with good accuracy in the discriminant function analysis. This result suggests that, although there appear to be aspects of emotion dysregulation in common between GAD and social anxiety disorder, there are also other aspects of emotion dysregulation more closely associated with one disorder than the other. The greater intensity of emotional experience among persons with GAD seems especially important here. Other theoretical models of GAD (e.g., Borkovec et al., 2004; Roemer & Orsillo, 2002) emphasize that individuals with GAD attempt to control or avoid emotional experience, and this conceptualization is consistent with our data. However, data from the discriminant function analysis suggest that poor understanding of emotions and negative reactivity to emotional experiences are most important in terms of differentiating the anxiety groups from the normal control group.

Specificity of difficulties with emotion dysregulation to GAD was observed only for emotion impulse strength and fear of depression. However, it is not necessary for aspects of emotion dysregulation to be specific to GAD for them to be important to how we understand and treat this disorder. An emotion regulation framework may provide an understanding of how the cognitive, behavioral, physiological, and interpersonal aspects of GAD are related. As previously described, among individuals who experience their emotions strongly and have limited ability to utilize or modulate emotions, worry may be used as a cognitive control strategy that dampens physiological and emotional arousal. In addition to attempting to manage strong emotions with worry, individuals with GAD may also behaviorally avoid situations or aspects of situations that have the potential to be emotionally evocative. Many of these emotionally evocative situations are likely to be interpersonal in nature. Avoidance behaviors and difficulties expressing emotions may contribute to the interpersonal dysfunction that is increasingly recognized among individuals with GAD. However, this assertion requires further research as the difference between persons with GAD and controls in expression of negative emotions was not replicated in the present study.

Cognitive behavioral techniques such as relaxation training and cognitive restructuring, which have been most frequently used in psychosocial treatment outcome studies, provide GAD patients with more adaptive skills for managing their emotional experience than worry. The literature suggests that these approaches benefit patients with GAD (Borkovec & Ruscio, 2001). However, 50% of patients are still symptomatic after cognitive behavioral treatment (Borkovec & Ruscio, 2001) and extending the duration of cognitive behavioral treatment does not improve outcome (Borkovec, Newman, Pincus, & Lytle, 2002). These findings suggest a need to look toward other perspectives to achieve increments in treatment efficacy. From an emotion regulation framework, although cognitive behavioral treatments may positively impact the patient's ability to manage his or her emotions, they may have minimal impact upon the patient's ability to access and utilize the adaptive information conveyed by his or her emotional experience. Emotion-focused approaches to

psychopathology emphasize helping patients to experience their emotions, to clarify what information their emotions convey regarding their needs and goals, and to use their emotions to motivate adaptive behavior (e.g., Greenberg, Rice, & Elliott, 1993; McCullough-Vaillant, 1996). From our theoretical perspective, integration of emotion-focused techniques with existing empirically supported cognitive behavioral approaches may provide a potent treatment for GAD. The goal of this treatment approach would be to help patients become more “emotionally intelligent.” Mayer and Salovey (1997) define emotional intelligence as “the ability to perceive accurately, appraise, and express emotion; the ability to access and/or generate feelings when they facilitate thought; the ability to understand emotion and emotional knowledge; and the ability to regulate emotions to promote emotional and intellectual growth” (p. 10). Thus, the goal is for emotions to be experienced, expressed, utilized, *and* regulated—with the environmental context determining what is optimal at any given point in time. Indeed, in recent years, several research groups have begun work to examine whether treatment of GAD can be improved by supplementing cognitive-behavioral treatments with techniques that emphasize experiencing and accepting emotions (e.g., Newman, Castonguay, Borkovec, & Molnar, 2004; Roemer & Orsillo, 2002).

Lastly, even where overlap in aspects of emotion dysregulation was observed between GAD and social anxiety disorder, it is also important to recognize that the same deficits may have different functions or consequences for each disorder. For example, although both anxiety groups reported elevated fear of positive emotions, individuals with GAD may primarily fear positive emotions because of a superstitious belief that, if they allow themselves to feel good rather than worry, bad things are more likely to happen. In contrast, individuals with social anxiety disorder may primarily fear positive emotions because, if they are expressed, others may not reciprocate or validate them.

Although not the primary focus of this study, these results also cast light on which aspects of emotion dysregulation may be most characteristic of social anxiety disorder. Socially anxious individuals described themselves as less expressive of positive emotions than both controls and individuals with GAD. Individuals with social anxiety disorder may engage in active attempts to suppress the expression of positive emotions, perhaps as a strategy to avoid becoming the center of attention or to protect themselves from being hurt if their feelings are not reciprocated. Expressive suppression is associated with negative consequences such as increased sympathetic activation of the cardiovascular system (Gross & Levenson, 1997) and decreased memory for emotion-eliciting situations (Richards & Gross, 2000). Additionally, deficits in expressing emotions are also likely to lead to negative interpersonal consequences. Emotion-expressive behavior is essential for communicating what one wants and influencing the actions and feelings of others (Gross & Levenson, 1997). Indeed, expressive suppression has been associated with poorer social support (Gross & John, 2003) and reduced feelings of rapport, motivation to become further acquainted and increased physiological reactivity in an interaction partner (Butler et al., 2003). Our data suggest that socially anxious individuals may not exhibit expressive behaviors indicating happiness, warm feelings, or excitement in appropriate contexts such as being approached for a conversation by someone

they find interesting or attractive. Consequently, the other person may be unaware of the socially anxious person's interest. In this way, the affiliation and closeness that individuals with social anxiety disorder so desperately want becomes less likely. Furthermore, although only a trend in this study, deficits in expression of negative emotions may lead to problems for socially anxious individuals. Previous research suggests that individuals with social anxiety disorder experience more anger than nonanxious persons (Erwin, Heimberg, Schneier, & Liebowitz, 2003; Meier, Hope, Weilage, Elting, & Laguna, 1995). However, they are much more likely to suppress the expression of anger (Erwin et al., 2003). If persons with social anxiety disorder are angry at how they are being treated but do not show their anger, they decrease their likelihood of receiving either reparations or better treatment in the future.

Socially anxious individuals also pay less attention to their emotions than both controls and individuals with GAD. Insufficient attention to emotions or active efforts to ignore emotions may contribute to the difficulties that individuals with social anxiety have regarding clarifying and identifying what emotions they are having and why they are having them. As previously discussed, individuals who are able to identify and utilize their emotions are more prepared to respond flexibly and adaptively to the current environment and to appropriately regulate their affect (Feldman-Barrett et al., 2001).

These results have implications for the treatment of social anxiety. In addition to helping individuals with social anxiety disorder confront feared social interactions and pay attention to information inconsistent with their maladaptive beliefs about themselves and others, it may also be beneficial to help them access and attend to adaptive primary emotions associated with the social situation at hand. For example, a socially anxious individual confronting a public speaking task may be aided in accessing, attending to, and utilizing adaptive positive emotions associated with giving a speech such as excitement about the topic or pride in the accomplishments that resulted in the invitation to speak. Socially anxious individuals may also be encouraged to express more of what they are feeling during social interactions as a way of not only confronting another aspect of what they fear (i.e., the experience and expression of emotions) but also to improve their ability to communicate with others about what they want and increase the chance that they will get their own needs met.

This study has several limitations. First, it used analogue GAD and social anxiety disorder groups. More differences may have been observed between groups if clinical samples had been used. Additionally, comorbid cases were excluded for conceptual clarity. In clinical samples, comorbid patients could be diagnosed as having principal GAD and secondary social anxiety disorder or vice versa, allowing for a more naturalistic comparison between groups, especially given the high degree of comorbidity between these two disorders. Another potential problem associated with use of analogue samples is that levels of severity or impairment may not be equivalent across the two groups. Therefore, replication of these findings with treatment-seeking samples diagnosed with structured interviews is an important agenda for future research, as is examining emotion dysregulation among persons with other psychiatric disorders. Sex differences emerged for some of the emotion variables, but our small sample of men with GAD ($n = 8$) prohibited a truly

adequate test of the interaction between sex and diagnosis for these variables. Additionally, self-report methods for the assessment of emotion may be subject to considerable bias (Davies, Stankov, & Roberts, 1998; Wagner & Waltz, 1998; Westen, 1994). Self-report measures assume that respondents are aware of their emotional experiences and are accurate in their observations of their own self-regulatory behavior. Therefore, it will be important for future research to employ more objective methodologies.

REFERENCES

- American Psychiatric Association (1987). *Diagnostic and statistical manual of mental disorders* (3rd ed., Revised). Washington, DC: Author.
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.
- Bagby, R. M., Parker, J. D. A., & Taylor, G. J. (1994a). The twenty-item Toronto Alexithymia Scale: I. Item selection and cross-validation of the factor structure. *Journal of Psychosomatic Research, 38*, 23–32.
- Bagby, R. M., Taylor, G. J., & Parker, J. D. A. (1994b). The twenty-item Toronto Alexithymia Scale: II. Convergent, discriminant, and concurrent validity. *Journal of Psychosomatic Research, 38*, 33–40.
- Berg, C. Z., Shapiro, N., Chambless, D. L., & Ahrens, A. H. (1998). Are emotions frightening II: An analogue study of fear of emotion, interpersonal conflict, and panic onset. *Behaviour Research and Therapy, 36*, 3–15.
- Borkovec, T. D., Alcaine, O., & Behar, E. (2004). Avoidance theory of worry and generalized anxiety disorder. In R. G. Heimberg, C. L. Turk, & D. S. Mennin (Eds.), *Generalized anxiety disorder: Advances in research and practice* (pp. 77–108). New York: Guilford Press.
- Borkovec, T. D., & Hu, S. (1990). The effect of worry on cardiovascular response to phobic imagery. *Behaviour Research and Therapy, 28*, 69–73.
- Borkovec, T. D., & Inz, J. (1990). The nature of worry in generalized anxiety disorder: A predominance of thought activity. *Behaviour Research and Therapy, 28*, 153–158.
- Borkovec, T. D., & Lyonfields, J. D. (1993). Worry: Thought suppression of emotional processing. In H. W. Krohne (Ed.), *Attention and avoidance: Strategies in coping with aversiveness* (pp. 101–118). Goettingen, Germany: Hogrefe & Huber Publishers.
- Borkovec, T. D., Newman, M. G., Pincus, A. L., & Lytle, R. (2002). A component analysis of cognitive behavioral therapy for generalized anxiety disorder and the role of interpersonal problems. *Journal of Consulting and Clinical Psychology, 70*, 288–298.
- Borkovec, T. D., & Ruscio, A. (2001). Psychotherapy for generalized anxiety disorder. *Journal of Clinical Psychiatry, 62*(Suppl. 11), 37–45.
- Borkovec, T. D., Shadick, R. N., & Hopkins, M. (1991). The nature of normal and pathological worry. In R. M. Rapee & D. H. Barlow (Eds.), *Chronic anxiety: Generalized anxiety disorder and mixed anxiety-depression* (pp. 29–51). New York, NY: Guilford Press.
- Breitholtz, E., Westling, B. E., & Öst, L.-G. (1998). Cognitions in generalized anxiety disorder and panic disorder patients. *Journal of Anxiety Disorders, 12*, 567–577.
- Brown, E. J., Turovsky, J., Heimberg, R. G., Juster, H. R., Brown, T. A., & Barlow, D. H. (1997). Validation of the social interaction anxiety scale and the social phobia scale across the anxiety disorders. *Psychological Assessment, 9*, 21–27.
- Brown, T. A., Antony, M. M., & Barlow, D. H. (1992). Psychometric properties of the Penn State Worry Questionnaire in a clinical anxiety disorders sample. *Behaviour Research and Therapy, 30*, 33–37.
- Brown, T. A., Chorpita, B. F., & Barlow, D. H. (1998). Structural relationships among dimensions of the DSM-IV anxiety and mood disorders and dimensions of negative affect, positive affect, and autonomic arousal. *Journal of Abnormal Psychology, 107*, 179–192.
- Brown, T. A., DiNardo, P. A., & Barlow, D. H. (1994). *Anxiety disorders interview schedule for DSM-IV (ADIS-IV)*. San Antonio, TX: Psychological Corporation.
- Brown, T. A., Marten, P. A., & Barlow, D. H. (1995). Discriminant validity of the symptoms constituting the DSM-III-R and DSM-IV associated symptom criterion of generalized anxiety disorder. *Journal of Anxiety Disorders, 9*, 317–328.
- Butler, E. A., Egloff, B., Wilhelm, F. H., Smith, N. C., Erickson, E. A., & Gross, J. J. (2003). The social consequences of expressive suppression. *Emotion, 3*, 48–67.

- Butler, G., Fennell, M., Robson, P., & Gelder, M. (1991). Comparison of behavior therapy and cognitive behavior therapy in the treatment of generalized anxiety disorder. *Journal of Consulting and Clinical Psychology, 59*, 167–175.
- Butler, G., Wells, A., & Dewick, H. (1995). Differential effects of worry and imagery after exposure to a stressful stimulus: A pilot study. *Behavioural and Cognitive Psychotherapy, 23*, 45–56.
- Cox, B. P., Swinson, R. P., Shulman, I. D., & Bourdeau, D. (1995). Alexithymia in panic disorder and social phobia. *Comprehensive Psychiatry, 36*, 195–198.
- Davies, M., Stankov, L., & Roberts, R. D. (1998). Emotional intelligence: In search of an elusive construct. *Journal of Personality and Social Psychology, 75*, 989–1015.
- DiNardo, P. A., Brown, T. A., & Barlow, D. H. (1994). *Anxiety disorders interview schedule for DSM-IV: Lifetime version (ADIS-IV-L)*. San Antonio, TX: Psychological Corporation.
- Duarte Silva, A. P., & Stam, A. (1995). Discriminant analysis. In L. G. Grimm and P. R. Yarnold (Eds.), *Reading and understanding multivariate statistics* (pp. 277–318). Washington, DC: American Psychological Association.
- Eng, W., & Heimberg, R. G. (in press). Interpersonal correlates of generalized anxiety disorder. *Journal of Anxiety Disorders*.
- Erwin, B. A., Heimberg, R. G., Schneier, F. R., & Liebowitz, M. R. (2003). Anger experience and anger expression in social anxiety disorder: Pretreatment profile and predictors of attrition and response to cognitive-behavioral treatment. *Behavior Therapy, 34*, 331–350.
- Feldman-Barrett, L., Gross, J., Conner-Christensen, T., & Benvenuto, M. (2001). Knowing what you're feeling and knowing what to do about it: Mapping the relation between emotion differentiation and emotion regulation. *Cognition and Emotion, 15*, 713–724.
- Freeston, M. H., Dugas, M. J., & Ladouceur, R. (1996). Thoughts, images, worry, and anxiety. *Cognitive Therapy and Research, 20*, 265–273.
- Foa, E. B., & Kozak, M. J. (1986). Emotional processing of fear: Exposure to corrective information. *Psychological Bulletin, 99*, 20–35.
- Fukunishi, I., Kikuchi, M., Wogan, J., & Takubo, M. (1997). Secondary alexithymia as a state reaction in panic disorder and social phobia. *Comprehensive Psychiatry, 38*, 166–170.
- Greenberg, L. S., Rice, L. N., & Elliot, R. (1993). *Facilitating emotional change: The moment-by-moment process*. New York: Guilford.
- Gross, J. J., & John, O. P. (1997). Revealing feelings: Facets of emotional expressivity in self-reports, peer ratings, and behavior. *Journal of Personality and Social Psychology, 72*, 435–448.
- Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology, 85*, 348–362.
- Gross, J. J., & Levenson, R. W. (1997). Hiding feelings: The acute effects of inhibiting negative and positive emotion. *Journal of Abnormal Psychology, 106*, 95–103.
- Hart, T. A., Jack, M., Turk, C. L., & Heimberg, R. G. (1999). Issues for the measurement of social anxiety disorder. In H. G. M. Westenberg & J. A. den Boer (Eds.), *Social anxiety disorder* (pp. 133–155). Amsterdam: Syn-Thesis Publishers.
- Heimberg, R. G., Mueller, G. P., Holt, C. S., Hope, D. A., & Liebowitz, M. R. (1992). Assessment of anxiety in social interaction and being observed by others: The social interaction anxiety scale and the social phobia scale. *Behavior Therapy, 23*, 53–73.
- Heimberg, R. G., & Turk, C. L. (2002). Assessment of social phobia. In R. G. Heimberg & R. E. Becker, *Cognitive-behavioral group therapy for social phobia: Basic mechanisms and clinical strategies* (pp. 107–126). New York: Guilford Press.
- Hoehn-Saric, R., & McLeod, D. R. (1988). The peripheral sympathetic nervous system: Its role in normal and pathologic anxiety. *Psychiatric Clinics of North America, 11*, 375–386.
- Hoehn-Saric, R., McLeod, D. R., & Zimmerli, W. D. (1989). Somatic manifestations in women with generalized anxiety disorder: Psychophysiological responses to psychological stress. *Archives of General Psychiatry, 46*, 1113–1119.
- Mattick, R., & Clarke, J. (1998). Development and validation of measures of social phobia scrutiny fear and social interaction anxiety. *Behaviour Research and Therapy, 36*, 455–470.
- Mayer, J. D., & Salovey, P. (1997). What is emotional intelligence? In P. Salovey & D. J. Sluyter (Eds.), *Emotional development and emotional intelligence* (pp. 3–31). New York: Basic Books.
- McCullough-Vaillant, L. (1996). *Changing character: Short-term anxiety-regulating psychotherapy for restructuring defenses, affects, and attachment*. New York: Basic Books.
- Meier, V. J., Hope, D. A., Weilage, M., Elting, D., & Laguna, L. (1995, November). *Anger and social phobia: Its expression and relation to treatment outcome*. Paper presented at the 29th annual convention of the Association for Advancement of Behavior Therapy, Washington, DC.

- Mennin, D. S., Heimberg, R. G., Turk, C. L., & Fresco, D. M. (2002). Applying an emotion regulation framework to integrative approaches to generalized anxiety disorder. *Clinical Psychology: Science and Practice, 9*, 85–90.
- Mennin, D. S., Heimberg, R. G., Turk, C. L., & Fresco, D. M. (in press). Preliminary evidence for an emotion dysregulation model of generalized anxiety disorder. *Behaviour Research and Therapy*.
- Mennin, D. S., Turk, C. L., Heimberg, R. G., & Carmin, C. (2004). Regulation of emotion in generalized anxiety disorder. In M. A. Reinecke and D. A. Clark (Eds.), *Cognitive therapy over the lifespan: Theory, research, and practice* (pp. 60–89). New York: Wiley.
- Meyer, T. J., Miller, M. L., Metzger, R. L., & Borkovec, T. D. (1990). Development and validation of the Penn State Worry Questionnaire. *Behaviour Research and Therapy, 28*, 487–495.
- Molina, S., & Borkovec, T. D. (1994). The Penn State Worry Questionnaire: Psychometric properties and associated characteristics. In G. C. L. Davey & F. Tallis (Eds.), *Worrying: Perspectives on theory, assessment and treatment* (pp. 265–283). Chichester, England: Wiley.
- Newman, M. G., Castonguay, L. G., Borkovec, T. D., & Molnar, C. (2004). Integrative therapy for generalized anxiety disorder. In R. G. Heimberg, C. L. Turk, & D. S. Mennin (Eds.), *Generalized anxiety disorder: Advances in research and practice* (pp. 320–350). New York: Guilford Press.
- Newman, M. G., Zuellig, A. R., Kachin, K. E., Constantino, M. J., Przeworski, A., Erickson, T., & Cashman-McGrath, L. (2002). Preliminary reliability and validity of the generalized anxiety disorder questionnaire-IV: A revised self-report diagnostic measure of generalized anxiety disorder. *Behavior Therapy, 33*, 215–233.
- Pincus, A. L., & Borkovec, T. D. (1994, June). *Interpersonal problems in generalized anxiety disorder: Preliminary clustering of patients' interpersonal dysfunction*. Paper presented at the annual meeting of the American Psychological Society, New York.
- Richards, J. M., & Gross, J. J. (2000). Emotion regulation and memory: The cognitive cost of keeping one's cool. *Journal of Personality and Social Psychology, 79*, 410–424.
- Roemer, L., Borkovec, M., Posa, S., & Borkovec, T. D. (1995). A self-report diagnostic measure of generalized anxiety disorder. *Journal of Behavior Therapy and Experimental Psychiatry, 26*, 345–350.
- Roemer, L., & Orsillo, S. M. (2002). Expanding our conceptualization of and treatment for generalized anxiety disorder: Integrating mindfulness/acceptance-based approaches with existing cognitive-behavioral models. *Clinical Psychology: Science and Practice, 8*, 54–68.
- Roemer, L., Salters, K., Raffa, S., & Orsillo, S. M. (2005). Fear and avoidance of internal experiences in GAD: Preliminary tests of a conceptual model. *Cognitive Therapy and Research, 29*, 71–88.
- Salovey, P., Mayer, J. D., Goldman, S. L., Turvey, C., & Palfai, T. P. (1995). Emotional attention, clarity, and repair: Exploring emotional intelligence using the Trait Meta-Mood Scale. In J. W. Pennebaker (Ed.), *Emotion, disclosure, and health* (pp. 125–154). Washington, DC: American Psychological Association.
- Schneier, F., Heckelman, L., Garfinkel, R., Campeas, R., Fallon, B., Gitow, A., Street, L., Del Bene, D., & Leibowitz, M. (1994). Functional impairment in social phobia. *Journal of Clinical Psychiatry, 55*, 322–331.
- Turk, C. L., Mennin, D. S., Fresco, D. M., & Heimberg, R. G. (2000, November). *Impairment and quality of life among individuals with generalized anxiety disorder*. Poster presented at the annual meeting of the Association for the Advancement of Behavior Therapy, New Orleans, LA.
- Turk, C. L., Heimberg, R. G., & Mennin, D. S. (2004). Assessment of worry and generalized anxiety disorder. In R. G. Heimberg, C. L. Turk, and D. S. Mennin (Eds.), *Generalized anxiety disorder: Advances in research and practice* (pp. 219–247). New York: Guilford.
- Vrana, S. R., Cuthbert, B. N., & Lang, P. J. (1986). Fear imagery and text processing. *Psychophysiology, 23*, 247–253.
- Wagner, A. W., & Waltz, J. (November, 1998). *What is alexithymia? Taking the validation of the alexithymia construct beyond self-report measures*. Paper presented at the annual meeting of the Association for Advancement of Behavior Therapy, Washington, DC.
- Wells, A., & Papageorgiou, C. (1995). Worry and the incubation of intrusive images following stress. *Behaviour Research and Therapy, 33*, 579–583.
- Westen, D. (1994). Toward an integrative model of affect regulation: Applications to social-psychological research. *Journal of Personality, 62*, 641–667.
- Williams, K. E., Chambless, D. L., & Ahrens, A. (1997). Are emotions frightening? An extension of the fear of fear construct. *Behaviour Research and Therapy, 35*, 239–248.