Emotion regulation refers to conscious and unconscious processes that influence the occurrence, intensity, duration, and expression of emotion (Gross, 2002). Despite the growing literature on emotion regulation in nonclinical samples and its potential relevance to emotional disorders, this topic has not been examined systematically in individuals with a history of psychopathology. Anxiety and mood disorders are characterized precisely by negative emotions that have become excessive and persistent; therefore, extending empirical research on emotion regulation to this population is warranted.

Emotion regulation also has come to the forefront in the newest wave of behavioral therapies for anxiety and depression. For example, the developers of Acceptance and Commitment Therapy (ACT) have proposed that much psychological distress persists due to maladaptive efforts to control negative emotions and other unwanted experiences (Hayes, Strosahl, & Wilson, 1999). Novel versions of cognitive–behavioral therapy for anxiety and mood disorders (Barlow, Allen, & Choate, 2005) and treatments for these problems that incorporate mindfulness (Roemer & Orsillo, 2002; Segal, Williams, & Teasdale, 2002) also discourage certain emotion control efforts. More empirical research is needed to test the assumptions about emotion regulation in clinical populations that underlie these treatments.

Many theories and experimental findings pertaining to emotion regulation can be applied to understanding anxiety and mood disorders (e.g., Gross, 2002; Mennin, 2004; Nolen-Hoeksema, 2000; Tamir, 2005) and an exhaustive review will not be possible here. It is notable that different emotion regulation strategies have been shown to impact the subjective, physiological, and behavioral components of negative emotion in distinct ways. For example, both cognitive reappraisal and suppression have been shown to decrease the behavioral expression of negative emotion, but only reappraisal decreases subjective distress (Gross, 1998). Moreover, emotion regulation strategies have varying effects on the temporal course of emotions. Rumination has been shown to prolong episodes of sadness, whereas distraction appears to shorten them (Nolen-Hoeksema & Morrow, 1993). Finally, habitual use of certain emotion regulation strategies is meaningfully associated with interpersonal functioning and well being (Gross & John, 2003), suggesting that some emotion regulation strategies may be “healthier” than others (John & Gross, 2004). All of these empirical findings may be relevant to understanding why negative emotions are excessive and persistent in anxiety and mood disorders; however, with the exception of establishing links between rumination and depressive disorders (Nolen-Hoeksema, 2000), the relationship between emotion regulation strategies and clinical disorders has yet to be explored.

One well-studied emotion regulation strategy that may have particular relevance to anxiety and mood disorders is suppression. Experimental studies have established that suppression reduces...
behavioral expression of emotion compared to control conditions, but does not decrease the subjective experience of negative emotion (Gross, 1998; Gross & Levenson, 1997). Moreover, suppression appears to increase the sympathetic arousal associated with negative emotion (Gross, 1998; Gross & Levenson, 1997). Increased sympathetic arousal is counterproductive to the goal of reducing the intensity of negative emotions like anxiety and anger and may be especially problematic for individuals with anxiety disorders, who often fear the physical sensations associated with sympathetic arousal (Reiss, Peterson, Gursky, & McNally, 1986).

Literature on thought and pain suppression further suggests that suppression may cause a paradoxical persistence of the unwanted experience. In their classic study, Wegner, Schneider, Carter, and White (1987) demonstrated that attempts to suppress thoughts about a white bear were associated with an increase in such thoughts during a post-suppression period in which participants were free to think about any topic. Individuals instructed to use suppression also experienced higher levels of pain after a coldpressor test compared to individuals instructed to use distraction or to focus on the pain sensations (Cioffi & Holloway, 1993). These results raise the question of whether suppression could be associated with a similar persistence of negative emotion after exposure to an emotional stimulus.

In addition to the immediate effects of suppression on the emotional response, habitual use of suppression is associated with experiencing less positive emotion and greater negative emotion overall, worse interpersonal functioning, and lesser well being (Gross & John, 2003). These findings contrast with the profile of individuals who habitually use another strategy—cognitive reappraisal—to manage emotions. Reliance on cognitive reappraisal correlates with more positive emotion and less negative emotion overall, better interpersonal functioning, and greater well being (Gross & John, 2003). Suppression, therefore, not only appears ineffective for reducing negative emotions in the short-term, but also may be related to longer-standing difficulties with emotion and interpersonal functioning. It is important to note that the direction of the relationship between suppression and emotional difficulties has not been established; although suppression may in some way contribute to emotional and interpersonal difficulties (John & Gross, 2004), it is also possible that individuals with emotional and interpersonal problems have a greater need to use suppression.

Recent studies of clinical samples provide some indirect evidence that individuals with anxiety and mood disorders rely on suppression to manage negative emotions. When compared to control participants on self-report questionnaires, individuals with panic disorder endorsed more habitual “smothering” of anger, sadness, and anxiety (Baker, Holloway, Thomas, Thomas, & Owens, 2004). In addition, individuals with panic disorder reported that the suppression instructions they heard as part of an experiment were very similar to the strategies they used to manage anxiety in their daily lives (Levitt, Brown, Orsillo, & Barlow, 2004). Finally, the construct of “experiential avoidance,” which includes the tendency to use suppression and other emotional control tactics, has been found to correlate with self-reported levels of anxiety and depression (Hayes et al., 2004).

Based on the available literature, we hypothesized that individuals with emotional disorders use suppression to regulate negative emotions more than individuals without these disorders. To test this hypothesis, we presented a negative emotion-provoking film to a diagnostically heterogeneous sample of individuals seeking treatment for anxiety and mood disorders (“clinical participants”). We compared their self-reported negative emotions and emotion regulation strategies to a control sample of individuals who had no current or lifetime anxiety or mood disorders (“nonclinical participants”). We predicted that the clinical participants would rate themselves as engaging in higher degrees of suppression (but not other regulation strategies) compared to nonclinical participants. Although some investigations have focused solely on suppression of the behavioral expression of emotion (e.g., Gross, 1998), we assessed participants’ suppression of “emotional reactions,” which included the subjective experience of emotion. Recent conceptualizations of anxiety and mood disorders have emphasized the potential role of suppression of internal states (Barlow et al., 2004; Hayes et al., 1999); therefore we measured “emotion suppression” in general rather than “expressive suppression” in particular.

In addition to comparing the use of suppression in individuals with and without emotional disorders, we sought to better understand the possible predictors and consequences of using suppression to regulate negative emotions. While external factors such as interpersonal demands may increase the importance of suppressing emotion (e.g., a person might need to suppress anger at her boss), we hypothesized that use of suppression is further influenced by internal factors, such as enduring beliefs about emotions (e.g., “Showing negative emotions is a sign of weakness.”) and acute appraisals of emotions (e.g., “Feeling sad right now is wrong.”). Judgments of the acceptability of emotions constitute one type of acute emotion appraisal that can be reliably measured (Mayer & Gaschke, 1988; Mayer & Stevens, 1994) and may be functionally related to emotion suppression. Specifically, individuals may suppress their emotions because they appraise them as unacceptable (e.g., “This anxiety is bad, so I should try to get rid of it.”).

One reason why individuals with anxiety and mood disorders may utilize suppression more than individuals without these problems could be because they appraise their emotions as unacceptable. Hayes and colleagues (1999) propose that chronic emotional distress results from efforts to avoid emotional discomfort, which stem from negative judgments of internal experiences (e.g., the judgment that a feeling is unacceptable). A recent study showed that individuals with probable generalized anxiety disorder rated their emotions as less acceptable than control subjects when presented with musical pieces that induced negative emotions (Mennin, Heimberg, Turk, & Fresco, 2005). Consistent with these findings, we predicted that clinical participants would judge their emotions as less acceptable than nonclinical participants. As noted above, we further predicted that judgments of unacceptability would be related to use of emotion suppression. We tested a mediational model in which higher levels of negative emotion predicted more perceived unacceptability of emotions, which in turn predicted suppression. We hypothesized that this model would hold true for both clinical and nonclinical participants.

We also evaluated the relationship of suppression to negative emotions that resulted from the induction. Because studies have shown that instructions to suppress emotions do not reduce the subjective experience of negative emotion in nonclinical participants (Gross, 1998; Gross & Levenson, 1997), we did not expect spontaneous use of suppression to be effective in ameliorating the negative emotions elicited during the induction. In fact, we hy-
pothesized that suppression would inhibit recovery of negative emotion after the induction for both clinical and nonclinical participants. We based this prediction on the studies reviewed above showing that suppression of other subjective states (e.g., thoughts, pain) leads to persistence of those experiences. To test the hypothesis that suppression would inhibit recovery of negative emotion in our study, we assessed negative emotion after a brief postfilm recovery period.

Method

Participants

The sample consisted of 60 patients who presented for assessment at the Center for Anxiety and Related Disorders at Boston University, and 30 individuals who had no history of clinically significant anxiety or mood disorders. Women constituted the larger portion of the sample (53.3%) and average age was 34.01 (SD = 12.67, range = 18 to 75). Participants were largely Caucasian (77.8%), with smaller numbers of individuals identifying as Asian (14.4%), Hispanic (3.3%), African American (2.2%), and Other (e.g., multiracial; 2.2%).

In the clinical sample, diagnoses were established with the Anxiety Disorders Interview Schedule for DSM–IV: Lifetime version (ADIS-IV-L; Di Nardo, Brown, & Barlow, 1994). The most frequent current diagnoses endorsed by clinical participants were social phobia (n = 34; 56.7%), major depressive disorder (n = 20; 33.3%), generalized anxiety disorder (n = 19; 31.7%), panic disorder with or without agoraphobia (n = 17; 28.3%), specific phobia (n = 10; 16.7%), obsessive–compulsive disorder (n = 10; 16.7%), and dysthymic disorder (n = 8; 13.3%). A minority (n = 18; 30.0%) of clinical participants met criteria for just one current diagnosis; others had two (n = 20; 33.3%), three (n = 15; 25.0%), or four (n = 7; 11.7%) current diagnoses. Patients were scheduled for participation in the current study within one month of their diagnostic assessment.

Patients were required to meet psychotropic medication stabilization criteria for the period prior to and overlapping with their diagnostic assessment and participation in this research study. In the current clinical sample, 26 participants (43.3%) were on a stabilized medication regimen (16 were taking a single medication, 8 were taking two medications, and 2 were taking three medications). Patients using anxiolytics (n = 15; 25%) were required to maintain the same dosage for at least one month. Patients taking antidepressants of any class (n = 15; 25%) were required to maintain the same dosage for three months. If patients had recently stopped treatment, the required washout period was one month for all types of medication. Clinical participants who were taking medication did not differ significantly from clinical participants who were not taking medication in their responses to the emotion induction (ps > .25). Therefore, medication use was not included as a factor in data analyses reported below.

Exclusion criteria for the clinical group were no current anxiety or mood disorder (n = 3); actively psychotic, suicidal, homicidal, or substance-abusing (n = 3); starting treatment before participation in the study could be scheduled (n = 13); previous participation in a similar study (n = 6); prior exposure to traumatic events similar to those depicted in the experimental stimulus (e.g., combat, gun violence; n = 2); or presence of a blood-injury-injection phobia that might cause fainting in response to the experimental stimulus (n = 3). Of the 125 clinical participants who were eligible, 60 completed the study (48%). The most common reasons for declining participation were failure to return phone calls regarding the study (n = 22), too busy to participate (n = 17), and apprehension about some aspect of the study procedure (n = 12).

Nonclinical participants were recruited through postings on Boston University’s website and employee newspaper. Individuals were eligible if they reported no current or past anxiety or mood difficulties that merited a clinical diagnosis on the Mini-Anxiety Disorders Interview Schedule for DSM–IV (Mini-ADIS; Brown, Di Nardo, & Barlow, 1994). One nonclinical participant was ultimately excluded from data analyses because he was an outlier in terms of his baseline emotional status (see Results). The composition of the final clinical and nonclinical samples did not differ according to gender, χ²(1, N = 89) = 0.71, p = .40, or age, t(87) = 1.28, p = .21. The nonclinical sample had significantly more members of ethnic minority groups than the clinical sample, χ²(1, N = 89) = 8.39, p = .003. However, when entered as a covariate, ethnicity was nonsignificant in all analyses (ps > .20).

Measures

Anxiety Disorders Interview Schedule for DSM–IV: Lifetime Version (ADIS-IV-L; Di Nardo et al., 1994). The ADIS-IV-L is a semistructured interview that assesses for DSM–IV anxiety, mood, somatoform, and substance use disorders and screens for the presence of other conditions (e.g., psychotic disorders). A reliability study of patients who had two independent administrations of the ADIS-IV-L indicated good to excellent interrater agreement for the majority of anxiety and mood disorders (Brown, Di Nardo, Lehman, & Campbell, 2001). When administering the ADIS-IV-L, interviewers assign a 0–8 clinical severity rating (CSR) that reflects the degree of distress and impairment associated with the disorder (0 = “none” to 8 = “very severely disturbing/disabling”). A CSR of 4 or higher reflects presence of a condition that is clinically significant; all participants in the clinical group received at least one current diagnosis with a CSR of 4 or higher. Diagnostic severity was not related to any of the outcomes of interest to this study; thus, CSR is not included as a variable in the analyses presented below.

Mini Anxiety Disorders Interview Schedule for DSM–IV (Mini-ADIS; Brown et al., 1994). The coverage and structure of the Mini-ADIS is identical to the ADIS-IV-L, except that it omits extensive sections designed to query past diagnoses. Therefore, reliability of current diagnoses established with the mini-ADIS is comparable to the ADIS-IV-L. Although detailed sections for assessment of past diagnoses are omitted, questions are included that probe for past problems with anxiety, depression, substance use, and somatization. In the event that a nonclinical participant endorsed a probe question about past anxiety or depression, follow-up questions were modeled after those included in the ADIS-IV-L. The mini-ADIS has been used in treatment outcome studies (e.g., Brown & Barlow, 1995) and was judged sufficient for assessing the eligibility of individuals to serve as control participants.

Positive and Negative Affect Scales: State Version (PANAS; Watson, Clark, & Tellegen, 1988). The PANAS is a 20-item scale consisting of adjectives that correspond to different emotions. For this study, the instructions asked participants to rate the degree to which they felt each emotion currently. Respondents rated each adjective on a 0 to 4 scale (0 = very slightly or not at all to 4 = extremely). The questionnaire is divided into two subscales of positive affect (PANAS-P; e.g., “excited,” “proud”) and negative affect (PANAS-N; e.g., “upset,” “hostile”). Each of these subscales produces scores ranging from 0 to 40. The PANAS has good reliability and validity (Mackinnon et al., 1999; Watson et al., 1988).

Meta Evaluation Scales (MES; Mayer & Stevens, 1994). The MES measures attitudes toward current emotions. The Acceptability and Clarity subscales of the MES were utilized for the current study (12 items total). The Acceptability subscale (MES-A) asks participants to rate the acceptability of their present emotions (e.g., “I shouldn’t feel this way” is a reverse scored item), while the Clarity subscale (MES-C) asks participants to rate the clarity of their emotions (e.g., “I know exactly what I’m feeling”). The MES-A scale was of particular interest to this study given the hypothesized relationship between perceived acceptability of emotions and suppression. The MES-C was included because some authors have reported that individuals with emotional disorders experience less clarity emotions than controls (Mennin et al., 2005; Turk, Heimberg, Luterek, Mennin, & Fresco, 2005) and we might need to control for this difference in our analyses. Respondents made 1 to 5 ratings for the items on the MES (1 = definitely does not describe my mood to 5 = definitely describes my
mood). Each of the MES subscales produces scores ranging from 6 to 30. Analyses by the scale authors suggest that the MES is a reliable and valid instrument (Mayer & Stevens, 1994).

Responses to Emotions Questionnaire (REQ). After the film, participants rated the degree to which they used different emotion regulation strategies on a questionnaire developed for this study. The questionnaire consisted of four items pertaining to different ways of changing emotions (suppression, distraction, reappraisal, and redirecting attention) and four items pertaining to letting emotions run their natural course. Participants used a 0 to 8 scale (0 = not at all to 8 = all the time) to rate how much each statement described their approach to emotions experienced during the film. The item, “I tried to hold back or suppress my emotional reactions,” was the variable of interest to this study. Use of the term “emotional reactions” was intended to capture suppression of internal experiences (e.g., feelings, symptoms), as well as suppression of the behavioral expression of emotion. For the factorial analyses of covariance (ANCOVAs) reported below, participants were classified as low, moderate, or high suppressors. Ratings of 0–2 (“not at all” or “rarely”) corresponded to a low level of suppression, ratings of 3–5 (“occasionally”) corresponded to a moderate level of suppression, and ratings of 6–8 (“often” to “all the time”) corresponded to a high level of suppression.

Stimulus

Film clips are a reliable method for eliciting emotions in the laboratory (e.g., Gross & Levenson, 1995; Hagemann et al., 1999). For this study, the stimulus was a 6-minute clip from the movie “The Deer Hunter” in which captured soldiers were forced to play “Russian Roulette.” The content of this film clip was expected to induce anxiety, because viewers would anticipate a highly aversive event—the soldiers shooting themselves in the head. We also expected it to induce dysphoria because the soldiers were depicted crying through much of the clip. Pilot testing confirmed that this clip was very effective in provoking negative emotions (mean PANAS-N = 19.00). Terms referring to generalized distress (e.g., “upset,” “distressed”) and anxiety-spectrum emotions (e.g., “nervous,” “scared”) were the most commonly endorsed negative emotions in response to the film.1

Procedure

Written consent was obtained from all participants prior to the experimental session. Nonclinical participants also completed the Mini-ADIS to confirm eligibility. They were then ushered into the laboratory where they sat in a reclining chair in front of a TV. Devices to measure heart rate, breathing, and skin conductance were attached; however, those data are not reported here because a large proportion was invalid. Once the set-up was complete, participants were informed that the experimenter (L.C.-S.) would be in the adjacent room and that they would communicate via intercom. Participants sat quietly for a 10-minute resting period followed by a questionnaire assessing baseline emotional state (PANAS). They next watched the 6-minute film clip and completed measures of their reactions to the film (PANAS, MES, REQ, and a rating of self-efficacy that is not reported here). After completing these measures, participants were asked to sit quietly for a few minutes. At the end of a 2-minute recovery period they again completed the PANAS. Participants were then shown a brief, relaxing film to assist them in recovering fully from the induction. A debriefing session that described the study aims completed the procedure.

Results

General Issues

Initial inspection of the data revealed that one nonclinical case was an outlier on baseline PANAS-N. Review of the participant’s Mini-ADIS showed that he was assigned a subclinical diagnosis of social phobia that was close to the threshold for clinical significance (CSR = 3). Based on these two pieces of information, he was judged inappropriate for inclusion in the nonclinical group and his data were excluded from subsequent analyses (resulting in N = 89).

Interviews after the experimental session revealed that 16 participants had prior exposure to the film clips. Individuals who had prior exposure to the film did not differ significantly from naïve participants on any of the variables of interest (all ps > .20). Moreover, the rates of prior exposure in the clinical and nonclinical groups were not significantly different, χ²(1, N = 89) = 2.55, p = .11. Therefore, participants with and without prior exposure to the film were grouped together for the purposes of data analysis. Although we did not advance any specific hypotheses about gender and ethnicity, we conducted exploratory analyses to determine the impact of these variables on outcomes of interest. Unless otherwise specified in the results section, the effects of gender and ethnicity were nonsignificant.

Manipulation Check

Means and standard deviations for PANAS-N scores taken at baseline, postfilm, and postrecovery for the clinical and nonclinical groups are presented in Table 1. An analysis of variance (ANOVA) was conducted with PANAS-N scores as a repeated measure and clinical status (clinical or nonclinical) as a between-subjects factor. The results showed that PANAS-N scores changed significantly over time, F(2, 86) = 78.08, p < .00, η² = .65, and that this effect was primarily quadratic in nature, F(1) = 149.06, p = .00, η² = .63. Inspection of means demonstrated that PANAS-N scores increased in response to the film and decreased after the recovery period. The film, therefore, achieved the desired effect of increasing negative emotion in the short term. The interaction between the repeated measure and clinical status was not significant, F(2, 86) = 0.82, p = .82, η² = .01, suggesting that the film impacted the clinical and nonclinical participants in a similar fashion. However, given that they started from a higher baseline level of negative emotion, clinical participants reported higher absolute levels of negative emotion on the PANAS, F(1) = 16.89, p = .00, η² = .16.

Use of Suppression and Judgments of Emotions in Response to the Emotion Induction

Our first hypothesis was that clinical participants would endorse greater use of emotion suppression during the film. Comparison of group means revealed that clinical participants reported higher levels of suppression than nonclinical participants on the REQ, t(87) = 2.36, p = .02, η² = .06. It is important to note that clinical and nonclinical participants did not differ on the other seven items pertaining to emotion regulation strategies (ps > .25).

1 The following positive affects (PA) and negative affects (NA) were endorsed to the greatest degree by participants: attentive (PA), alert (PA), interested (PA), upset (NA), distressed (NA), nervous (NA), jittery (NA), scared (NA), and afraid (NA). All had a mean rating of >1 (“a little”) on the PANAS for the total sample and are listed in descending order of mean intensity.
To investigate the possible interaction of gender and clinical status in predicting suppression, we conducted a $2 \times 2$ (gender $\times$ clinical status) ANOVA with REQ suppression ratings as the dependent variable. A significant gender $\times$ clinical status interaction was observed, $F(1) = 6.92$, $p = .01$, $\eta^2 = .08$, while the main effect of clinical status was reduced to a trend, $F(1) = 3.57$, $p = .06$, $\eta^2 = .04$ (the main effect of gender was nonsignificant). Males in the nonclinical group suppressed their emotions more than females in the nonclinical group. In contrast, males and females in the clinical group engaged in similar levels of suppression. Moreover, whereas males in the nonclinical and clinical groups did not differ in use of suppression, females with anxiety and mood disorders suppressed their emotions significantly more than females without these disorders (see Figure 1).

We also predicted that clinical participants would judge their emotions as less acceptable than nonclinical participants. Clinical participants reported lower acceptability of their emotions (MES-A) compared to nonclinical participants, $t(87) = 2.39$, $p = .02$, $\eta^2 = .07$. While this difference was statistically significant, it was small in magnitude and, on average, both groups rated their emotions as quite acceptable (see Table 1). Clinical and nonclinical groups did not differ in the clarity of their emotions resulting from the film (MES-C), $t(87) = 0.59$, $p = .55$, $\eta^2 = .01$, suggesting that the lower perceived acceptability in the clinical group was not simply due to negative response bias.

**Relationship of Suppression and Negative Emotion During the Emotion Induction**

We next examined the relationship between use of suppression and levels of negative emotion during the induction. A $3 \times 2$ ANCOVA was conducted to evaluate the relationships of suppression level (low, moderate, high), clinical status (clinical or nonclinical), and their interaction to negative emotion assessed immediately after the film (“postfilm” PANAS-N). Baseline PANAS-N scores were entered as a covariate to control for baseline differences in negative emotion. As expected, the baseline scores were significantly related to postfilm PANAS-N scores, $F(1) = 19.34$, $p = .00$, $\eta^2 = .19$. Once the effect of baseline negative emotion was accounted for, clinical status was not a significant predictor of postfilm PANAS-N scores, $F(1) = 0.79$, $p = .38$, $\eta^2 = .01$. However, a significant main effect of suppression level was observed, $F(2) = 4.17$, $p = .02$, $\eta^2 = .09$. Pairwise comparisons demonstrated that participants reporting high levels of suppression endorsed higher levels of negative emotion compared to both low suppressors ($p = .01$) and moderate suppressors ($p = .03$), who did not differ from one another ($p = .20$; see Figure 2). The clinical status $\times$ suppression level interaction was not significant, $F(2) = 1.27$, $p = .29$, $\eta^2 = .03$, which suggests that the relationship between suppression and negative emotion during the film was similar for the two groups.

There are several possible explanations for the positive relationship between negative emotion and use of suppression during the emotion induction. High levels of negative emotion could provoke use of suppression as a regulation strategy, suppression could inadvertently cause an increase in negative emotion, a bidirectional relationship could exist, or an unmeasured third variable could produce increases in both. Because our measures of negative emotion and suppression were taken concurrently, it is impossible to definitively evaluate the causal relationship (if one exists) between them. However, statistical methods for testing mediation allowed us to evaluate one plausible model of this relationship. As noted in the Introduction, we hypothesized that higher levels of negative emotions during the film would lead to more perceived unacceptability of emotions, which in turn would lead to increased suppression.

To test this full mediational hypothesis, three separate regressions involving postfilm PANAS-N, MES-A, and suppression ratings from the REQ were conducted (Baron & Kenny, 1986). MES-A scores were first regressed onto postfilm PANAS-N scores to test the relationship between the independent variable and the mediator. Next, the relationship between the independent variable (postfilm PANAS-N) and the outcome variable (suppression ratings) was tested. Finally, suppression ratings were simultaneously regressed onto postfilm PANAS-N and MES-A to evaluate poten-
tial mediation. This series of analyses was performed in the clinical group only because preliminary analyses in the nonclinical sample indicated that the preconditions for testing mediation were not met; the hypothesized mediator was not significantly related to the independent or outcome variables in the nonclinical sample.

For the clinical group, the regression of MES-A scores onto PANAS-N scores was significant, $R = .56$, $F(1, 58) = 27.00, p = .00, R^2 = .32$, as was the regression of suppression ratings onto PANAS-N scores, $R = .27, F(1, 58) = 4.54, p = .04, R^2 = .07$. These results indicated that the preconditions for testing mediation using multiple regression were satisfied (Baron & Kenny, 1986). The final model in which suppression ratings were regressed onto both MES-A and PANAS-N scores was significant, $R = .47, F(2, 57) = 8.18, p = .00, R^2 = .22$. Inspection of regression coefficients showed that MES-A significantly predicted suppression $t = -3.32, B = -.21, SE = .06, \beta = -.47, p = .00$; however, with MES-A in the model the relationship between PANAS-N and suppression became nonsignificant, $t = 0.03, B = .00, SE = .04, \beta = .01, p = .97$. This result suggests that perceived acceptability of mood mediated the relationship between level of negative emotion and suppression in clinical participants ($\tau^2 = .26$ for indirect effect). To confirm this interpretation, the Sobel test of mediation was used to evaluate the significance of the indirect effect of negative emotion on suppression via perceived acceptability of mood (Mackinnon, Warsi, & Dwyer, 1995). The Sobel test confirmed that the indirect effect was significant ($z = 2.81, p = .01$).

**Relationship of Suppression to Negative Emotion After the Induction**

Another 3 (suppression level) × 2 (clinical status) ANCOVA was conducted to test the hypothesis that suppression during the film would be associated with negative emotion during the recovery period for both groups. Baseline PANAS-N scores were entered as a covariate and displayed a significant relationship to postrecovery PANAS-N scores, $F(1) = 35.63, p = .00, \tau^2 = .30$. Clinical status did not significantly impact postrecovery PANAS-N scores, $F(1) = 1.69, p = .20, \tau^2 = .02$. However, there was a significant main effect of suppression level, $F(2) = 3.84, p = .03, \tau^2 = .09$. Pairwise comparisons demonstrated that participants reporting high levels of suppression endorsed higher levels of negative emotion during the recovery period compared to both low suppressors ($p = .01$) and moderate suppressors ($p = .01$), who did not differ from one another ($p = .85$; see Figure 2). The clinical status × suppression level interaction was not significant, $F(2) = 1.67, p = .19, \tau^2 = .04$, suggesting that the relationship between suppression and negative emotion during the recovery period was similar for the two groups.

**Discussion**

In the present investigation, individuals with anxiety and mood disorders differed from control participants in their use of emotion suppression and their tendency to judge negative emotions as unacceptable. When exposed to the same emotion-provoking film, clinical participants endorsed greater use of suppression, but not other emotion regulation strategies. This difference was attributable to increased suppression by females with emotional disorders compared to females without these disorders. Clinical participants also judged their resulting emotions as less acceptable than nonclinical participants. Judging emotions as unacceptable was functionally related to suppression in the clinical sample in that higher levels of negative emotion predicted unacceptability judgments, which in turn predicted suppression. Clinical and nonclinical participants who engaged in high levels of suppression endorsed more negative emotion during the film and after a postfilm recovery period compared to individuals who engaged in low or moderate suppression.

The finding that clinical participants demonstrated increased use of suppression is consistent with theoretical accounts that conceptualize maladaptive efforts to control unwanted emotions as part of the phenomenology of emotional disorders (Barlow et al., 2005; Hayes et al., 1999). However, it is notable that the difference in suppression observed in our study was attributable to the behavior of female participants only. Consistent with prior findings showing that men suppress more than women (Gross & John, 2003), males in the nonclinical group reported more suppression than females in the nonclinical group. However, males and females with clinical emotional disorders engaged in suppression to the same degree and at a level comparable to that of the males in the nonclinical group. These results suggest that increased suppression may be a distinguishing feature of emotional disorders in females, but not males. However, this conclusion is tentative because it is possible that a ceiling was reached in terms of how much emotion suppression would be elicited by our experimental context. A stronger or more naturalistic emotional stimulus might elicit increased suppression in males with emotional disorders relative to males in the control group. Gender did not interact with suppression level to predict negative emotion during the film and recovery period; therefore, at this juncture, we have no evidence that suppression relates to the intensity or duration of emotion differently in females and males.
This question merits investigation in future studies that are specifically designed and powered to assess such effects.

The current findings add to the literature suggesting that there is a relationship between use of suppression as an emotion regulation strategy and high levels of negative emotion (Gross & John, 2003). The directionality of this relationship cannot be established from the current study because we opted to study “naturally occurring” emotion suppression, rather than manipulating levels of suppression experimentally. We used statistical methods to test one plausible model of the relationship between negative emotion experienced during the film and suppression. In this model, suppression was conceptualized as arising from high levels of negative emotion that were perceived as unacceptable. However, it is also possible that suppression causes increases in negative emotion—perhaps because elevated sympathetic arousal (which has been shown to accompany suppression; e.g., Gross, 1998) exacerbates negative emotion or because individuals become distressed by their failure to achieve complete suppression of negative emotions. Negative emotion and suppression also could have a bidirectional or “vicious cycle” relationship, or a third variable (e.g., neuroticism) could explain their association. Although our data do not conclusively discriminate among these equivalent models, the proposed mediational model fit the data for the clinical group well. Our results thus provide preliminary evidence that, in patients with anxiety and mood disorders, higher levels of negative emotion may lead to judgments that emotions are unacceptable, which in turn lead to suppression efforts.

High levels of suppression during the film also were associated with increased levels of negative emotion after the recovery period. In the Introduction, we suggested that emotion suppression, like pain or thought suppression (Cioffi & Holloway, 1993; Wegner et al., 1987), could lead to persistence or slowed recovery of the unwanted experience. This appeared to be the case for individuals in our sample who engaged in high levels of suppression. They experienced significantly higher levels of negative emotion after the recovery period than low to moderate suppressors (even after baseline differences in negative emotion were accounted for). This suggests that a prolonging of negative emotion after the offset of emotional stimuli may be an unintended consequence of suppression. An alternative interpretation to consider is that individuals whose emotions tend to recover more slowly may be more likely to utilize suppression as an emotion regulation strategy.

The fact that perceived acceptability of emotions emerged as a factor that was associated with emotion suppression in the clinical group suggests that models of emotion regulation may benefit from consideration of individuals’ beliefs about emotions as well as their “in-the-moment” appraisals of the acceptability/unacceptability of current emotions. Such beliefs and appraisals may contribute to the overall experience of emotions (e.g., perceptions of unacceptability might enhance negativity of an emotional experience) and/or may influence selection of regulation strategies. The reason why perceived acceptability of emotions was linked to use of suppression in the clinical group but not the nonclinical group is not clear. One possibility is that the smaller nonclinical sample size did not provide sufficient power to detect this relationship. However, the magnitude of the correlation between perceived acceptability and suppression was small enough ($r = -0.21$) to cast doubt on this interpretation. An additional factor was that the range of perceived acceptability scores was more restricted in the non-clinical group, with 80% of nonclinical participants receiving a score of 24 or higher (out of 30) on the MES-A. This suggests that most nonclinical participants rated their emotions as very acceptable, and there may have been too few individuals who judged their emotions unacceptable to assess the relationship between this variable and suppression. Finally, it may be the case that acceptability of emotions is only important to the selection of regulation strategies in persons who have chronic difficulties with emotions. Negative attitudes about emotions may very well emerge as a result of frequent experience of negative emotions, and these, in turn, may play a role in the way that such individuals respond to emotional arousal.

In one respect, it is puzzling that clinical participants who judged their emotions as unacceptable engaged in more suppression. It might be argued that individuals who find negative emotions unacceptable should learn to use strategies that are most successful in getting rid of emotions. One possibility is that individuals are not regularly aware of emotion regulation strategies and their consequences (though they can self-report on them when prompted). In other words, individuals may not always be aware that they are engaging in suppression and that it is not working. They also may not have explicitly compared how they generally feel when suppressing versus not suppressing emotions. If so, they might maintain the erroneous belief that suppression is helpful and that, if they did not use this strategy, their negative emotions would increase even more. Finally, individuals who judge negative emotions as unacceptable may be hesitant to use more adaptive strategies like cognitive reappraisal, because these strategies require more processing of the emotional situation in order to be helpful (i.e., a person engaging in reappraisal has to attend to the details of the emotional situation in order to generate an appropriate reinterpretation). The process of “thinking through” an emotionally upsetting situation requires more engagement than simply trying to be less aware of the thoughts and feelings that a situation elicits.

The current study had several methodological limitations. First, although our stimulus was very successful in eliciting negative emotions, it did not produce a uniform effect across all participants in terms of the specific emotions that were triggered. Although participants endorsed higher levels of general distress and anxiety in response to the film, minorities of participants also reported other negative emotions at moderate levels or greater (e.g., 14% endorsed shame; 3% endorsed guilt). On the one hand, the ability of the stimulus to elicit a range of negative emotions may enhance the external validity of the study. Real life events such as interpersonal conflict or loss likely trigger a complex array of emotions rather than a single, discrete emotion. However, it might be argued that different emotions could relate to acceptability judgments and suppression in distinct ways. Although this topic certainly merits further investigation, existing research indicates that suppression produces surprisingly similar subjective, behavioral, and physiological consequences across different emotions (e.g., disgust, sadness, amusement, embarrassment; Gross, 2002).

In a similar vein, a decision was made in this study to consider individuals with anxiety and mood disorders as a group rather than recruiting individuals with a specific disorder. This decision reflects the theoretical perspective of anxiety and mood disorders as sharing important underlying features such as trait negative affect (e.g., Brown, Chorpita, & Barlow, 1998; Clark & Watson, 1991). The findings regarding the effects of suppression in nonclinical
samples are relevant across the emotional disorders; and, indeed, ineffective emotion regulation might be considered a candidate for a vulnerability characteristic that cuts across specific disorders. Nevertheless, the failure to examine acceptability judgments and emotion suppression separately in the various anxiety and mood disorders is a potential limitation of the study. For example, individuals with primarily phobic disorders might differ substantially in emotion regulation from individuals with more chronic negative emotions (e.g., those with generalized anxiety disorder or dysthymia). These questions await larger studies with adequate power to detect differences across diagnostic groups. In the meantime, it may be useful to note that individuals with mood disorders in this sample (47%) did not differ significantly from individuals without mood disorders on measures of negative emotion, acceptability of emotions, or suppression ($p_s > .20$).

The current study relied on self-report measures of emotion and emotion regulation. Participants can only report on attitudes and behaviors of which they are conscious; however, much emotion regulation may occur outside of conscious awareness (Gross, 2002; Masters, 1991). For example, attention is hypothesized to play an important role in modulation of emotion (e.g., individuals may differ in their attentiveness to emotion-provoking cues); however, deployment of attention toward or away from emotional cues is unlikely to occur at a fully conscious level. Gross (1999) also suggests that emotion regulation behaviors that have become habitual (e.g., making a joke when anxious) may be acted on without conscious awareness of their purpose. The current investigation adds to our understanding of conscious efforts to regulate emotions; however, it does not allow for any conclusions to be drawn about emotion regulation strategies that occur without conscious effort. Our reliance on self-report also prevented us from examining the impact of suppression on the physiological and behavioral manifestation of emotions.

In general, further studies are needed to relate the growing literature on emotion regulation in nonclinical samples to individuals with anxiety and mood disorders. For example, cognitive reappraisal has been shown to be a relatively effective strategy for reducing subjective negative emotion in nonclinical samples (Gross, 1998); however, the effects of this strategy in persons with clinical disorders are unknown. Furthermore, improvements are needed in the measurement of key constructs, such as suppression and other emotion regulation strategies, which were measured with single items in this study. One measure of suppression and reappraisal has been developed and validated (Gross & John, 2003). This measure, called the Emotion Regulation Questionnaire, assesses habitual use of suppression and reappraisal. Other reliable and valid measures are needed to assess in-the-moment strategies used by participants in emotion induction paradigms. In addition, incorporation of implicit measures of emotion regulation (e.g., startle potentiation; Jackson et al., 2003) would strengthen future studies of emotion regulation in clinical samples.

The results of this investigation support the clinical wisdom that some efforts to suppress emotions are counterproductive. This accords with recommendations that patients should refrain from attempts to control their emotions through overt or subtle avoidance behaviors (Barlow et al., 2005). Indeed, the present findings suggest that if individuals engage in suppression, they may unintentionally increase and prolong negative emotion. Moreover, our results suggest that facilitating acceptance of emotions might lead to better outcomes when negative emotions arise. From a therapeutic perspective, the nonjudgmental observation that characterizes mindfulness and the stance of willingness promoted in ACT represent possible methods for altering the perceived acceptability of emotions (Hayes et al., 1999; Segal et al., 2002). These novel treatments for anxiety and depression also encourage patients to abandon their reliance on emotion suppression, a recommendation that may avert the maladaptive effects of suppression observed in this and other investigations.

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