

## **Mediating Social Anxiety and Disordered Eating: The Role of Expressive Suppression**

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*Social anxiety and disordered eating frequently overlap, and evidence suggests that emotional suppression may be an important mediating factor. The present study examines the relationships among social anxiety, emotional suppression, and disordered eating in a non-clinical sample of 160 undergraduate women. Participants completed self-report measures for social anxiety, disordered eating, expressive suppression, depression, and negative affect. Results from mediation analyses indicate that the relationship between social anxiety and disordered eating is fully mediated by expressive suppression. Findings are consistent with a displacement theory in which unexpressed negative affect is shifted towards the body, thereby promoting symptoms of disordered eating.*

Recent clinical and epidemiological studies confirm that comorbidity among mental disorders is the norm, rather than the exception (e.g., Kessler, 1997; Kessler et al., 1994). Social anxiety disorder (SAD) is significantly more common among individuals with eating disorders than control groups (Godart, Flament, & Lecrubier, 2000; Godart, Flament, Perdereau, Jeammet, & Strober, 2002). The lifetime prevalence of SAD has been reported as 33.9% among individuals with anorexia nervosa (Halmi et al., 1991) and as 17% among individuals with bulimia nervosa (Brewerton, Lydiard, Ballenger, & Herzog, 1993). In the largest study to date examining patterns of comorbidity

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among eating disorders and anxiety disorders, Kaye, Bulik, Thornton, and Barbarich (2004) reported that approximately 20% of individuals with an eating disorder also met criteria for SAD. Retrospective studies indicate that the onset of anxiety disorders tends to precede the development of eating disorders (Brewerton et al., 1993; Bulik, Sullivan, & Joyce, 1997; Kaye et al., 2004), leading some researchers (e.g., Schwalberg, Barlow, Alger, & Howard, 1992) to suggest that social-evaluative fears are a risk factor for eating disorders.

Social anxiety appears to hamper treatment seeking among individuals with eating disorders (Erwin, Heimberg, Schneier, & Franklin, 2003). The core feature of SAD, fear of negative evaluation, has been identified as a primary factor preventing individuals with SAD from seeking treatment (Olfson et al., 2000). Among individuals who do seek treatment for an eating disorder, those with higher levels of social anxiety are less likely to engage in treatment (Goodwin & Fitzgibbon, 2002). Thus, social anxiety may represent both a risk factor for the development of an eating disorder and as a barrier to effective treatment.

Clinically, individuals with SAD and eating disorders both demonstrate significant concern about how they appear to others (Brewerton et al., 1993). Individuals with SAD fear negative evaluation of their appearance and/or behavior, whereas individuals with eating disorders fear negative evaluation of their body weight or shape. This observation has led some researchers to propose that comorbid social anxiety disorder results when fear of negative body evaluation generalizes to other situations (Bulik, Beigel, Duchmann, Theodore, & Kaye, 1991; Bulik et al., 1997; Schwalberg et al., 1992). However, this notion implies that fear of negative body evaluation is primary and represents a risk factor in developing SAD, which contradicts data regarding the sequence of onset for the disorders.

An alternate hypothesis is that suppressing negative emotions associated with social anxiety increases the risk for disordered eating. Because individuals with SAD generally consider themselves to be socially inadequate, they assume that others will judge them critically. This perceived criticism may explain why individuals with SAD report significantly greater anger and poorer anger expression skills than non-anxious controls (Erwin et al., 2003). Further, the tendency to blame oneself for criticism (real or perceived) rather than others is associated with higher levels of social anxiety and correlates with increased anger proneness and hostile attitudes (Gilbert & Miles, 2000). Individuals with SAD may suppress these feelings for fear that others will evaluate expressions of anger negatively. In fact, Erwin et al. (2003) found that individuals with SAD were significantly more likely to suppress feelings of anger (e.g., harboring grudges, sulking, being secretly critical of others) than non-anxious controls. Recent research shows that individuals with SAD indicate being less aware of and having a greater difficulty describing their emotions compared to controls and to individuals

with generalized anxiety disorder (Turk, Heimberg, Luterek, Mennin, & Fresco, 2005). As the authors point out, this may contribute to a poor understanding of affective experiences and result in maladaptive regulation strategies such as suppression.

Eating disorders are more common among females than males within clinical (Nielson, 2001), and non-clinical samples (Hoek, 1993). The feminist notion of “self-silencing” suggests that emotional suppression may be especially common among women. Feminist theories propose that women are socialized to “silence” or suppress negative thoughts and feelings in order to avoid potential conflicts and preserve close relationships (Gilligan, 1990; Thomas, 2003). Women who fear that others will censure their character if they express negative affect may be especially prone to develop a pattern of self-silencing. In addition, self-silencing may be motivated by a desire to avoid experiencing negative feelings. This notion is consistent with findings of high levels of harm avoidance among individuals with SAD (Bienvenu & Stein, 2003) and women with anorexia nervosa (Bulik et al., 1995; Klump et al., 2004). In sum, women with high levels of social anxiety may be more likely to experience negative feelings (due to perceived criticism) and be more likely to suppress these feelings (for fear expression will be criticized). The consequences of emotional suppression among this population may set the stage for the development of disordered eating.

The displacement theory of eating disorders (Bruch, 1973, 1978) contends that unexpressed hostility and sadness are shifted towards the self in the form of body dissatisfaction and low self-esteem. According to this theory, certain symptoms of disordered eating, such as self-induced vomiting, function as ways to cope with these unexpressed negative feelings (Thomas, 2003). In support of this hypothesis, Geller, Cockell, and Goldner (2000) found that women with anorexia nervosa scored significantly higher on a measure of self-silencing attitudes and behaviors than women with other psychiatric disorders and healthy controls. They also found that inhibited emotional expression was significantly related to negative feelings and thoughts about the body. The authors suggested that women with anorexia may redirect negative feelings toward others onto non-threatening targets, such as the body (Geller, Cockell, & Goldner, 2000).

According to a study by Waller et al. (2002), women diagnosed with anorexia, bulimia, or binge-eating disorder all reported significantly greater anger suppression than control women, indicating that emotional suppression may be characteristic of individuals across eating disorder subtypes. High levels of disordered eating also are associated with a tendency to inhibit negative feelings among non-clinical adolescent women (Zaitsoff, Geller, & Srikameswaran, 2001). Thus, although only a small number of studies have examined inhibited emotional expression and eating disorder symptomatology, the relationship appears robust regardless of diagnostic subtype or clinical status.

Despite some evidence that greater emotional suppression is associated with eating disorder symptomology, the nature of this relationship is not well understood. Recent work on emotion regulation by Gross and colleagues may help elucidate the significance of emotional suppression within eating disorder populations. According to Gross' (1998, 2002) model, strategies that act early in the emotion-generative process have different consequences than those that operate later. The model highlights two commonly used strategies for regulating emotion: cognitive reappraisal, which involves modifying one's interpretation of a situation to alter its emotional impact, and expressive suppression, which involves the inhibition of outward signs of inner feelings. Expressive suppression has its primary impact late in the emotion-generative process (i.e., after the emotional response has already been generated) via the inhibition of emotion-expressive behavior (Gross & John, 2003). Thus, unlike cognitive reappraisal, which occurs before emotions have been fully generated, expressive suppression is effective in changing only the expression, but not the experience, of negative emotion (Gross & John, 2003). Interestingly, this is consistent with the finding that women with eating disorders are more likely to suppress negative emotions, but not less likely to report experiencing these emotions than control women (Geller et al., 2000; Waller et al., 2002; Zaitsoff, Geller, & Srikameswaran, 2001; Zhu & Walsh, 2002).

Several of the consequences of expressive suppression are particularly relevant to disordered eating. In a series of studies investigating the impact of expressive suppression, Gross & John, (2003) found that compared to individuals who use reappraisal, suppressors tend to experience and express less positive emotion but experience greater negative emotion. The authors proposed that a discrepancy between the inner experience and the outer expression of emotion resulting from use of expressive suppression may create a sense of being "fake" or untrue to oneself, leading to feelings of guilt and worthlessness. Indeed, greater habitual use of expressive suppression was found to be significantly associated with greater inauthenticity. Further, they found that suppressors were less satisfied with themselves and their relationships, had lower self-esteem, were more pessimistic about their future, and were more prone to depression (Gross & John, 2003).

The role of emotional regulation as a possible etiological link between SAD and eating disorders has received little attention. Displacement theories predict that greater emotional suppression among individuals with SAD creates vulnerability for disordered eating as unexpressed negative affect is redirected towards the body. This suggests that emotion suppression mediates the relationship between SAD and eating disorders.

The present study explores the relationships among social anxiety, expressive suppression, and disordered eating in a non-clinical sample of women. It is hypothesized that disordered eating will be positively related with social anxiety, expressive suppression, depression, and trait negative

affect. Women scoring above the suggested clinical cut-off on a measure of eating disorder symptomology are expected to score significantly higher on all measures compared to those scoring below the cut-off. Social anxiety is expected to relate both with greater habitual use of expressive suppression and disordered eating, while suppression is expected to predict greater disordered eating. Further, suppression is hypothesized to mediate the relationship between social anxiety and disordered eating. An independent relationship between social anxiety and disordered eating is expected to remain after controlling for depression and negative affect. Negative affect is considered a higher order factor that influences more specific symptom domains of emotional disorders, such as social anxiety (Brown, Chorpita, & Barlow, 1998). Thus, a specific effect of social anxiety on disordered eating is predicted given the hierarchical relationship between these constructs is assumed.

## METHOD

### Participants

Participants were 160 female undergraduate psychology students at the University of Nebraska—Lincoln recruited through the department's subject pool. Only female participants were chosen given that disordered eating predominately affects women compared to men (Nielson, 2001). The mean age of the women was 19.96 years ( $SD = 1.2$ ) with a range of 19–26 years. The majority of participants (87.7%) were Caucasian, 4.3% were Hispanic, 1.8% were African-American, and 1.2% were Asian-American. Although this sample includes only college undergraduates, it is not simply a sample of convenience given the prevalence of eating disorders in college settings (Heatherton et al., 1995).

### Measures

#### EMOTION REGULATION QUESTIONNAIRE (ERQ; GROSS & JOHN, 2003)

The suppression subscale of the ERQ includes five items developed to assess the habitual use of *expressive suppression* (e.g., “I control my emotions by not expressing them”). Respondents are asked to indicate the extent to which they agree with each statement on a seven-point scale from “strongly disagree” to “strongly agree.” Acceptable internal consistency ( $\alpha = .72$ ) was found for the suppression subscale within the sample.

#### SOCIAL INTERACTION ANXIETY SCALE (SIAS; MATTICK & CLARKE, 1998)

The SIAS is a measure of social anxiety within the context of social interactions with other individuals. The scale consists of 20 items rated on a

5-point Likert scale ranging from “not at all characteristic of me” to “extremely characteristic of me.” Mattick and Clark (1998) reported acceptable test-retest reliability and internal consistency across patient and control groups. The SIAS correlates well with other measures of social anxiety (Mattick & Clarke, 1998) and social interaction anxiety (Heimberg, Mueller, & Holt, 1992). The internal reliability of the SIAS in this sample was adequate ( $\alpha=.79$ ).

#### EATING ATTITUDES TEST (EAT; GARNER & GARFINKEL, 1979)

The EAT is a 40-item self-report measure of disordered eating. Items are self-statements related to abnormal eating attitudes and behaviors presented in a 6-point Likert format ranging from “never” to “always.” Total scores range from 0 to 120, with higher scores indicating higher levels of disordered eating. The authors of the scale suggest using a cut-off score of 30 to indicate a clinical case of eating disorder (Garner & Garfinkel, 1979). Concurrent validity and internal reliability of the EAT are adequate (Garner & Garfinkel, 1979). The EAT-40 showed good internal reliability ( $\alpha=.84$ ) in the present sample.

#### BECK DEPRESSION INVENTORY-II (BDI-II; BECK, STEER, & BROWN, 1996)

The BDI-II is a 21-item self-report measure of depressive symptoms experienced during the past week. Items are rated on a 4-point Likert scale. This measure is considered to have adequate reliability, validity, and one week test-retest reliability (Beck et al., 1996; Whisman, Perez, & Ramel, 2000). The internal reliability of the BDI-II is not available for this sample because individual item data were not entered. Other studies with North American college-student samples have found Cronbach's alphas ranging from 0.89 (Whisman et al. 2000) to 0.93 (Beck et al., 1996).

#### POSITIVE AND NEGATIVE AFFECT SCHEDULE (PANAS; WATSON, CLARK, & TELLEGEN, 1988)

The negative affect subscale of the PANAS includes items designed to measure negative affect experience such as distress, anger, contempt, and disgust. The items of this scale are rated on a 5-point scale from “very slightly or not at all” to “very much.” The PANAS has been shown to have sufficient internal reliability and convergent validity (Watson et al., 1988). In order to assess trait negative affectivity, participants were instructed to respond to items on the PANAS with regard to how they felt “in general.” Both the BDI-II and the PANAS-negative were included in order to control for the effect of general negative affect, thereby allowing for a more precise measurement of the relationship between social anxiety and disordered

eating. The PANAS-negative subscale showed good internal reliability ( $\alpha = .83$ ) in the present sample.

## Procedure

Following informed consent, participants completed a questionnaire packet that included demographic questions and all study measures. Participants were tested in small groups and were fully debriefed regarding the aims of the study. Participants received partial psychology course credit in exchange for participation.

## RESULTS

Table 1 provides the means and standard deviations of all self-report measures. To compare levels of psychological distress among individuals scoring below and above the suggested clinical cut-off on the EAT-40, between-group ANOVA analyses were conducted. Means and standard deviations on all study measures for these two groups are shown in Table 2, along with the results of ANOVA and effect size analyses. Consistent with prevalence rates within college-aged samples, 10.6% of the sample scored above the clinical cut-off on the EAT-40. High scorers on the EAT-40 demonstrated significantly greater scores on the BDI-II, the PANAS-negative, and the ERQ-suppression.

Table 3 provides results from correlation analyses among all study measures. As predicted, disordered eating was positively and significantly related with depression ( $r = .44, p < .001$ ), negative affectivity ( $r = .30, p < .001$ ), social anxiety ( $r = .20, p < .05$ ), and expressive suppression ( $r = .19, p < .05$ ).

Baron and Kenny's (1986) four-step regression approach was used to test the hypothesis that emotional suppression mediates the relationship of social anxiety on disordered eating. According to Preacher and Leonardelli (2001), full mediation is said to occur when the following four conditions

**TABLE 1** Means and Standard Deviations for Full Sample ( $N=160$ )

Measures	<i>M</i>	<i>SD</i>
EAT-40	14.13	11.68
SIAS	21.75	11.49
BDI-II	11.38	7.21
PANAS-negative	21.03	6.48
ERQ-suppression	12.71	5.06

*Note.* EAT-40=Eating Attitudes Test-40; SIAS=Social Interaction Anxiety Scale; BDI-II=Beck Depression Inventory-II; PANAS-negative=Positive and Negative Affect Schedule-Negative Affect Subscale; ERQ-suppression=Emotion Regulation Questionnaire-Suppression Subscale.

**TABLE 2** Means, Standard Deviations, ANOVAs, and Effect Sizes for Women Scoring Below ( $N=143$ ) and Above ( $N=17$ ) the Clinical Cut-off on the EAT-40

Measure	Below cut-off		Above cut-Off		$F$	$\eta$
	$M$	$SD$	$M$	$SD$		
EAT-40	10.98	7.01	40.53	9.60	348.02**	0.90
SIAS	21.24	11.57	26.06	10.11	2.71	0.21
BDI-II	10.64	6.50	17.53	9.81	15.09**	0.45
PANAS-negative	20.57	6.08	24.82	8.49	6.78*	0.32
ERQ-suppression	12.36	4.50	15.65	8.10	6.61*	0.32

Note. EAT-40=Eating Attitudes Test-40; SIAS=Social Interaction Anxiety Scale; BDI-II=Beck Depression Inventory-II; PANAS-negative=Positive and Negative Affect Schedule-Negative Affect Subscale; ERQ-suppression=Emotion Regulation Questionnaire-Suppression Subscale.

\* $p < .05$ , \*\* $p < .001$ .

**TABLE 3** Correlations Among Measures of Disordered Eating, Social Anxiety, Negative Affect, and Expressive Suppression ( $N=160$ )

Measure	EAT-40	SIAS	BDI-II	PANAS-negative
SIAS	0.20*			
BDI-II	0.44**	0.23**		
PANAS-negative	0.30**	0.35**	0.54**	
ERQ-suppression	0.19*	0.27**	0.17*	0.18

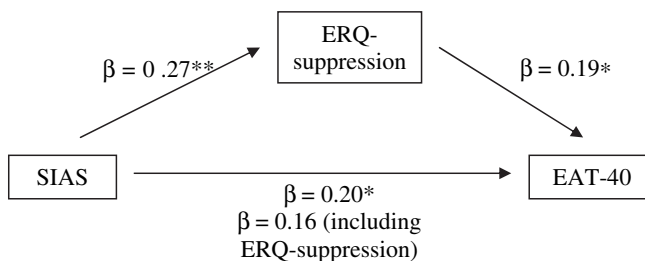
Note. EAT-40=Eating Attitudes Test-40; SIAS=Social Interaction Anxiety Scale; BDI-II=Beck Depression Inventory-II; PANAS-negative=Positive and Negative Affect Schedule-Negative Affect Subscale; ERQ-suppression=Emotion Regulation Questionnaire-Suppression Subscale.

\* $p < .05$ , \*\* $p < .001$ .

are met: (1) the independent variable (e.g., SIAS) significantly affects the mediator (e.g., ERQ-suppression), (2) the independent variable significantly affects the dependent variable (e.g., EAT) in the absence of the mediator, (3) the mediator has a significant unique effect on the dependent variable, and (4) the effect of the independent variable on the dependent variable is no longer significant when the mediator is added to the model.

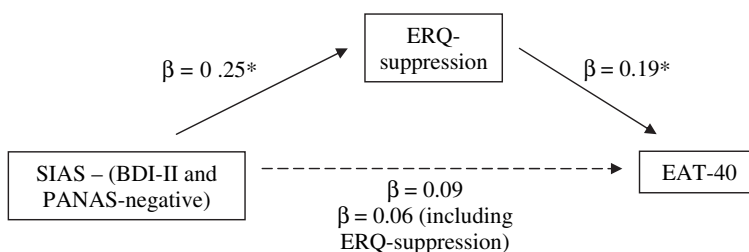
Results of the regression analyses, including the standardized regression coefficients and standard error terms are shown in Figure 1. As hypothesized, all four conditions for mediation were met: (1) the SIAS significantly predicted the EAT-40 ( $\beta=0.20$ ,  $p < .05$ ), (2) the SIAS significantly predicted the ERQ-suppression ( $\beta=.27$ ,  $p < .01$ ), (3) the ERQ-suppression significantly predicted the EAT-40 ( $\beta=.19$ ,  $p < .05$ ), and (4) the effect of the SIAS on the EAT-40 is no longer significant when the ERQ-suppression is added to the regression model ( $\beta=0.16$ ,  $p > .05$ ). Sobel's (1982) test was used to ensure that the indirect effect of the SIAS on the EAT-40 via the ERQ-suppression was significantly different from zero. Results revealed significant mediation, Sobel  $z=2.51$ ,  $p < .05$ . Details of the Sobel test can be found in Sobel (1982) and MacKinnon, Warsi, and Dwyer (1995).





**FIGURE 1** Standardized regression coefficients ( $\beta$ ) for the associations among the SIAS, ERQ-suppression, and the EAT-40.

Note. EAT-40=Eating Attitudes Test-40; SIAS=Social Interaction Anxiety Scale; ERQ-suppression=Emotional Regulation Questionnaire-Suppression Subscale; \* $p < .05$ , \*\* $p < .001$ .



**FIGURE 2** Standardized regression coefficients ( $\beta$ ) for the associations among the SIAS, ERQ-suppression, and the EAT-40, controlling for BDI-II and PANAS-negative.

Note. EAT-40=Eating Attitudes Test-40; SIAS=Social Interaction Anxiety Scale; BDI-II=Beck Depression Inventory-II; PANAS-negative=Positive and Negative Affect Schedule-Negative Affect Subscale; ERQ-suppression-Emotion Regulation Questionnaire=Suppression Subscale; \* $p < .05$ .

A second set of regression analyses was run to examine whether the relationships observed in the mediation model would remain significant when the effects of the SIAS were controlled for depression and negative affectivity. As shown in Figure 2, results show that when controlling for the influence of the BDI-II and the PANAS-negative, the SIAS continues to significantly predict the ERQ-suppression ( $\beta=0.11, p < .05$ ), but no longer significantly predicts the EAT-40 ( $\beta=0.09, p=.26$ ). Thus, although there is a specific effect of the SIAS on the ERQ-suppression, the relationship between the SIAS and the EAT-40 is not independent of negative affect and depression. Only the BDI-II significantly predicted the EAT-40 scores when the SIAS and PANAS-negative were also included as predictors ( $\beta=0.63, p < .05$ ).

## DISCUSSION

Previous research suggests that social anxiety may be a risk factor for the development of disordered eating. SAD and eating disorders are frequently

comorbid, and the onset of SAD typically occurs prior to the development of the eating disorder (e.g., Kaye et al., 2004). Emotional regulation may be an important mediating factor, given that individuals with SAD experience high levels of negative affect (Gilbert & Miles, 2000; Erwin et al., 2003) and are more likely to suppress negative feelings, presumably due to the feared social consequences of expression (Erwin et al., 2003).

The displacement hypothesis suggests that unexpressed negative feelings are redirected towards less threatening targets, such as the body, and manifest as high levels of body dissatisfaction characteristic of individuals with eating disorders. Consistent with this explanation, disordered eating has been associated with a tendency to suppress negative feelings (Geller et al., 2000; Waller et al., 2002; Zaitsoff et al., 2001). These findings suggest that expressive suppression may play a mediating role in the relationship between social anxiety and disordered eating.

The present study examined the relationships among social anxiety, expressive suppression, and disordered eating in a non-clinical sample of undergraduate women. Consistent with previous research, disordered eating was associated with greater depression, negative affectivity, social anxiety, and habitual expressive suppression. Several studies have identified a relationship between eating disorders and alexithymia, defined as a cognitive-emotional deficit in identifying and understanding one's own feelings and the feelings of others (Bydlowski et al., 2005; Cochrane, Brewerton, Wilson, & Hodges, 1993; Schmidt, Jiwany, & Treasure, 1993). Alexithymia is associated with greater negative affect (e.g., Bydlowski et al., 2005; Subic-Wrana et al., 2005), and may interact with the tendency to suppress emotional expression to increase disordered eating vulnerability, although this hypothesis has not been tested.

Social anxiety was significantly associated with expressive suppression, even when controlling for negative affectivity. Given that measures of social anxiety and negative affect tend to be highly correlated, this suggests social anxiety is a robust predictor of expressive suppression, and is consistent with the recent findings of Kashdan and Steger (2006). The results of the mediation analyses revealed that expressive suppression fully mediates the relationship between social anxiety and disordered eating, clearly implicating expressive suppression as an important link between SAD and eating disorders. Social anxiety was found to predict expressive suppression, even after controlling for the effect of general negative affectivity. Given that measures of social anxiety and negative affect tend to be highly correlated, this suggests social anxiety is a robust predictor of expressive suppression.

According to the displacement hypothesis, women with high levels of social anxiety suppress the expression of negative emotions and shift them onto the body, thereby increasing body dissatisfaction and other symptoms of disordered eating. The results from the present study suggest that unexpressed negative feelings do not simply dissolve away, and may be

expressed in maladaptive ways that create vulnerabilities to other forms of psychopathology, such as disordered eating. This emphasizes the importance of addressing emotional regulation skills within clinical settings and incorporating interventions that teach coping strategies to deal with feelings of anger, hostility, and resentment more adaptively.

The present study is exploratory and has several limitations. First, while this paper assumes that the habitual suppression of negative affect plays a central role in the relationship between social anxiety and disordered eating, it should be noted that the ERQ does not differentiate between the regulation of positive versus negative emotion. Indeed, recent work (e.g., Brown et al., 1998; Kashdan et al., 2006) has implicated a unique role for diminished positive affect experience in individuals with excessive social anxiety. Therefore, future research may benefit from measuring use of expressive suppression separately by the valence of the emotion being regulated. Second, because men were excluded from the sample, the results of this study apply only to women. It would be interesting to determine whether the results generalize to men, given that gender socialization theories would predict that self-silencing occurs more frequently among women. Lastly, the participants represented a non-clinical sample who were not screened for presence of psychological disorders. Whether the relationship among social anxiety, expressive suppression, and disordered eating found in the present study replicates across clinical samples is yet to be determined.

Results from the present study suggest that the relationship between social anxiety and disordered eating is fully accounted for by the habitual use of expressive suppression as an emotion regulation strategy. Of course, these data do not directly address the issue of causality. Longitudinal and experimental designs are needed in order to identify the causal relationships among these variables. As Mackinnon, Lockwood, and Hoffman (2002) point out, adding design features that establish temporal precedence would rule out alternative explanations that otherwise preclude causal interpretations. Future studies should include additional measures of emotion identification and regulation and assess how individuals with social anxiety and disordered eating identify and regulate both negative and positive affect. It also would be informative to replicate these findings across genders and among clinical samples.

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