Assessing Emotion Regulation in Social Anxiety Disorder: The Emotion Regulation Interview

Kelly H. Werner · Philippe R. Goldin · Tali M. Ball ·
Richard G. Heimberg · James J. Gross

Abstract Social anxiety disorder (SAD) is thought to involve emotional hyper-reactivity and emotion dysregulation. However, the precise nature of the emotion dysregulation in SAD has not been well characterized. In the present study, the Emotion Regulation Interview (ERI) was developed to quantify the frequency and self-efficacy of five emotion regulation strategies specified by Gross's (Review of General Psychology 2: 271–299, 1998) process model of emotion regulation. Forty-eight individuals with SAD and 33 healthy controls (HCs) were interviewed about responses during (a) a laboratory speech task and (b) two recent social anxiety-evoking situations. Individuals with SAD reported greater use of avoidance and expressive suppression than HCs, as well as lesser self-efficacy in implementing cognitive reappraisal and expressive suppression. These regulation deficits were not accounted for by differences in emotional reactivity. These findings highlight specific emotion regulation deficits in SAD, and support the idea that the Emotion Regulation Interview may be usefully applied to other clinical disorders.

K. H. Werner (✉) · P. R. Goldin · J. J. Gross
Department of Psychology, Stanford University,
420 Jordan Hall, Room 430,
Stanford, CA 94305, USA
e-mail: kwerner@stanford.edu

R. G. Heimberg
Department of Psychology, Temple University,
Philadelphia, PA, USA

T. M. Ball
Psychiatry Department, University of California San Diego,
9500 Gilman Drive, Mailcode 0855 La Jolla,
CA 92093-0855, USA

Social Anxiety Disorder (SAD) is the fourth most common psychiatric disorder, with a lifetime prevalence rate of 12.1% (Kessler, et al. 2005). It is characterized by an intense fear of social situations, and it often co-occurs with other psychiatric disorders, such as generalized anxiety disorder, agoraphobia, major depression, and substance abuse (Schneier et al. 1992).

Cognitive models of social anxiety posit that emotion hyper-reactivity and dysregulation are core features of SAD (Hermann et al. 2004; Hofmann 2004). Motivated by these models, research to date has focused on the role of cognitive appraisals in maintaining social anxiety. However, the differential use of emotion regulation strategies has not been well characterized in SAD. This is a key limitation because emerging clinical research suggests that emotion dysregulation may underlie many mood and anxiety disorders (Kring and Werner 2004), including SAD (Etkin and Wager 2007; Turk et al. 2005).

Healthy individuals engage in *emotion regulation* (ER), which refers to attempts to influence which emotions they have, when they have them, and how they experience and express these emotions (Gross 1998). Effective emotion regulation can reduce emotional reactions to stressful, anxiety-provoking situations. Conversely, difficulties with emotion regulation have been postulated as a core mechanism of anxiety disorders (Campbell-Sills and Barlow 2007; Werner and Gross 2009), and accordingly, clinical treatments focus on enhancing the use of emotion regulation skills to modulate emotional reactivity (e.g., Hayes et al. 1999; Linehan 1993).

The process model of emotion regulation, proposed by Gross (1998), provides a framework for delineating different types of emotion regulation strategies. This model identifies five types of emotion regulation strategies. S*ituation selection* entails choosing whether or not to enter

a potentially emotion-eliciting situation. Specifically, it involves choosing to approach or avoid certain people, places, or activities. *Situation modification* involves modifying something about the situation in order to enhance or diminish its emotional impact. Within the situation, *attentional deployment* refers to directing one's attention to a specific feature of the environment in order to change that situation's emotional impact. *Cognitive change* describes the active modification of the meaning or importance of the situation, again with the goal of altering emotional responding. Once the emotional response has been generated, *response modulation* involves increasing or decreasing the expression of that emotion (e.g., suppression of facial expression). Attempts to regulate one's emotion may involve multiple regulatory strategies, which may be used in adaptive or maladaptive ways.

Few studies have investigated emotion regulation in individuals with SAD (Kashdan 2007; Turk et al. 2005), and no study has used a theoretically derived framework in order to investigate multiple emotion regulation strategies within one research paradigm. The main finding from previous research regarding emotion regulation in SAD is that, like other anxiety disorders, overt and subtle avoidance of threatening situations maintains SAD (Wells and Papageorgiou 1998). Beyond that, little is known regarding specific emotion regulation habits of people with SAD. Thus while excess fear and anxiety characterizes SAD, little work has been done to systematically characterize the role of emotion regulation in maintaining these heightened levels.

Interestingly, although it is known that cognitive behavioral therapy is quite helpful for SAD (Heimberg 2002), there is little empirical research on the usage of cognitive regulation in SAD. In one recent fMRI investigation of emotion regulation in individuals with SAD, Goldin and colleagues found that, compared to healthy controls, individuals were less likely to recruit cognitive regulation brain networks when instructed in response to social anxiety stimuli (Goldin et al. 2009). More evidence is needed to determine whether people with SAD implement cognitive regulation with less frequency than healthy controls. It is also unclear whether people with SAD have lower levels of perceived self-efficacy in using cognitive regulation.

Research has demonstrated a vigilance-avoidance response for people with SAD in response to social stimuli. This response is thought to indicate inflexible avoidant responding with attention deployment within a few seconds of a social threat (Bögels and Mansell 2004). Here there is indication of a distraction response on a short time scale, yet it is unclear whether people with SAD use more conscious and prolonged mental distraction techniques to cope with social situations.

Furthermore, there is some indication that expressive suppression may be problematic in SAD; Kashdan and colleagues found that higher suppression recording in a daily diary study was correlated with fewer positive experiences in individuals with SAD (Kashdan 2007). Further research is needed to determine whether individuals with SAD are over-using suppression in comparison to their healthy counterparts.

The goal of the present study was to examine emotion dysregulation in SAD. To achieve this goal, the Emotion Regulation Interview (ERI) was developed. The ERI is a structured interview that assesses emotion regulation strategies specified in Gross's process model of ER. The current study hypothesized that compared to healthy controls, individuals with SAD would endorse greater frequency of use of situation selection, situation modification, attention deployment, and response modulation (suppression), but lesser use of cognitive change. It was further hypothesized that individuals with SAD would report less self-efficacy than controls when implementing emotion regulation strategies.

Methods

Participants

Participants with generalized SAD and demographically-matched healthy control (HC) participants were recruited using flyers, internet postings, presentations at community forums, and local radio programs. After the initial telephone screening of 243 persons for general psychopathology and medical conditions, 64 potential participants with SAD and 41 potential HCs were invited to the laboratory and administered the Anxiety Disorders Interview Schedule for DSM-IV, Lifetime version (ADIS-IV-L; Di Nardo et al. 1994). The ADIS-IV-L was conducted by clinical psychologists (PG, KW) and a graduate student in psychology (TB).

The inclusion criterion for the clinical group was a principal diagnosis of generalized SAD, the more insidious and debilitating sub-type of SAD, defined as greater than moderate anxiety/fear for five or more distinct social situations, with or without GAD, agoraphobia, specific phobia, or dysthymic disorder. Exclusion criteria included (1) any other current DSM-IV Axis I disorders (besides GAD, Agoraphobia, Dysthymia, and Specific Phobia), (2) lifetime history of schizophrenia spectrum or bipolar disorders, or (3) current psychotherapy or psychotropic medication use. Because participants were recruited as part of a larger study, they additionally met criteria for fMRI scanning. Potential HCs met the above criteria and were also excluded for any lifetime DSM-IV Axis I disorder as

assessed by the ADIS-IV-L (Di Nardo et al. 1994). All participants provided informed consent in accordance with the Stanford University Human Subjects Committee guidelines.

The final sample included 48 individuals with a primary Axis-I diagnosis of SAD and 33 HCs who did not differ in age, gender, education, or ethnicity (Table 1). For individuals with a primary Axis-I diagnosis of SAD, current (non-primary) Axis I co-morbidity included ten with dysthymic disorder, seven with generalized anxiety disorder (GAD), and three with specific phobia; eight also reported past major depression and two past substance abuse now in full remission. Twenty individuals with SAD reported past (i.e., ended more than 3 months prior) experience with psychotherapy, and eight reported past psychotropic medication use.

The Emotion Regulation Interview (ERI)

The ERI is a structured clinical interview based on Gross's (1998) process model of emotion regulation. Currently, measures of emotion regulation rely solely on self-report and there are no interviews assessing a theoretically derived framework of emotion regulation strategies—the ERI fills this gap in the literature.

Participants were asked how they regulated their emotions in three situations: during a two-minute video-taped speech in the laboratory about a recent social anxiety-evoking situation and during two idiographic social anxiety-evoking situations that occurred within the last month. Our goal in using both a laboratory speech task and idiographic recent real-life situations was to maximize

Table 1 Demographics for social anxiety disorder and healthy control participants

	SAD Mean ± SD	HC Mean ± SD
Age (years)	33±8.2	33±9.4
Gender		
Men	25	16
Women	23	17
Education (years)	16.4±1.5	17.2±1.6
Ethnicity		
Caucasian	26	19
Asian American	15	10
Latino	4	3
African	1	0
Native American	1	1
Native Hawaiian	1	0

SAD individuals with social anxiety disorder, *HC* healthy controls, *SD* standard deviation

*p<.05, **p<.01

internal and external validity. The ERI was given just after an impromptu speech task. The speech was very anxiety producing, particularly for the participants with SAD, and was very fresh in participants' minds as they were answering ERI questions. In addition, participants were asked about two recent situations from their own lives to gain a more representative picture of the types of social situations and subsequent regulation strategies participants were likely using in their everyday lives.

For the laboratory speech task, participants were asked about their frequency of usage of attentional deployment, cognitive change, and expressive suppression. There was little opportunity to employ situation selection and situation modification during the speech task, therefore these emotion regulation strategies were not assessed with respect to the laboratory speech task. For the two idiographic situations, participants were asked to identify and report on specific situations in which they felt anxiety of 60 or above on the Subjective Units of Distress Scale (SUDS; Wolpe 1958) from 0 (calm) to 100 (most anxiety felt in life). Examples of idiographic situations included speaking up on a conference call, interviewing for a job, and talking to a child's teacher. Participants were asked about the frequency of the five emotion regulation strategies, and about the self-efficacy of implementation of two of these strategies.

Participants were asked to estimate the frequency of use 0% (never; or not at all) to 100% (always) of each strategy during the speech and the idiographic situations and to enumerate examples of strategies. The five ER strategies (and their specific verbal probes) were: "What percent of the time do you _____ to reduce your anxiety?" (1) *Situation Selection*: avoid situations (2) *Situation Modification*: modify the situation (3) *Attentional Deployment*: distract yourself (4) *Cognitive Change*: think about the situation differently (5) *Expressive Suppression*: hide the visible signs of your anxiety.

Participants were also asked to provide ratings of their self-efficacy in employing cognitive change and expressive suppression strategies. Specifically, participants were asked to rate the self-efficacy (0 = not, 100 = completely) of their cognitive change ("When you tried to change how you were thinking in order to reduce your anxiety in this situation, how successful were you at reducing your anxiety?") and expressive suppression ("When you tried to hide your anxiety so that others couldn't tell that you were anxious in this situation, how successful were you at appearing calm?"). The rationale for focusing on these was that long-term use of cognitive change and expressive suppression have differential effects on well-being (Gross and John 2003).

The ERI was conducted by interviewers trained by a clinical psychologist to assure reliability in the delivery

of the interview. Training included watching videotaped interviews and administration of the interview to other research assistants, the psychologist, and a pilot participant. Additionally, the psychologist sat in on the first interviews with individuals to ensure that there were no deviations from standard interview procedure and reviewed tapes of the initial three interviews. An independent interviewer watched the video-tapes of the ERI and weighted Kappa agreement was .95 for percentages recorded.

Measures to Assess Convergent Validity of the ERI

Convergent validity was established by correlating the ERI subscales with questionnaires containing corresponding content. In particular, for situation selection, avoidance was assessed; for attentional deployment, distraction was assessed; for ERI suppression and reappraisal frequency, suppression and reappraisal usage were assessed. For perceived success at using suppression and reappraisal, suppression and reappraisal self-efficacy was assessed.

Avoidance was assessed using the self-report version of the Liebowitz Social Anxiety Scale (LSAS-SR) (Fresco, et al. 2001; Rytwinski, et al. 2009), which is derived from the clinician administered Liebowitz Social Anxiety Scale (LSAS; Liebowitz 1987). There are two subscales, social fear and social avoidance with respect to 24 specific social situations. These include 11 social interactions (e.g., going to a party) and 13 performance situations (e.g., giving a talk). The current study used the avoidance subscale, in which participants rated avoidance ranging from 0 (*Never 0%*) to 3 (*Usually 67–100%*). The LSAS shows good psychometric characteristics in both clinician administered (Baker et al. 2002; Heimberg, et al. 1999; Weeks, et al. 2005) and self-report (Fresco, et al. 2001; Rytwinski, et al. 2009) formats.

Distraction was assessed using the Response Styles Questionnaire (RSQ; Nolen-Hoeksema and Morrow 1991), which assesses participants' tendencies to ruminate in response to their symptoms of negative emotion. The RSQ includes 22 items describing responses and can be divided into an 11 item rumination subscale and an 11 item distraction subscale. An example item from the distraction subscale is "I think about how hard it is to concentrate" and respondents rate on a scale from 1 (almost never) to 4 (almost always). Previous studies have reported acceptable convergent and predictive validity for the RSQ (Nolen-Hoeksema and Morrow 1991).

Suppression and cognitive reappraisal were assessed using a modified version of the Emotion Regulation Questionnaire (ERQ; Gross and John 2003). The cognitive reappraisal scale has eight items (e.g., "I control my emotions by changing the way I think about the situation

I'm in.") and the suppression subscale has eight items (e.g., "When I am feeling negative emotions (e.g., anxiety, sadness), I make sure not to express them.") Participants rated their agreement or disagreement with each item on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). This scale shows good reliability and convergent as well as discriminant validity (Gross and John 2003).

Emotion regulation self-efficacy was assessed using the Emotion Regulation Questionnaire—Self Efficacy (ERQ-SE; Goldin et al. 2009). Participants indicate how capable they are of using reappraisal [suppression] when they really want to, using the same item set described immediately above. Participants rated their agreement or disagreement with each item on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*).

Procedure

Participants who were eligible after the clinical diagnostic interview returned on another day for a two-hour behavioral assessment which included the laboratory speech task and the ERI. At the diagnostic interview session, participants' social anxiety and avoidance were assessed using the Liebowitz Social Anxiety Scale (LSAS; Liebowitz 1987) (SAD: $M=81.9$, $SD=18.8$; HC: $M=15.2$, $SD=9.0$). At the second session, participants gave two two-minute speeches standing right in front of a video-camera with a researcher observing the speeches. Subjective Units of Distress (SUDS) ratings were obtained before and after each speech (Wolpe 1958). After the speeches, the ERI was conducted and required approximately 30 min.

A subset of the individuals with SAD returned 4 months after their initial assessment to complete a post wait-list research assessment for a second time and reported on similar idiographic situations for the ERI ($N=14$). These participants were part of a larger treatment study but did not receive treatment between Time 1 and Time 2. Again participants gave a two-minute speech and after the speech, the ERI was conducted and lasted approximately 30 min.

Analyses

To assess test-retest reliability, ERI responses of SAD participants were assessed over a 4 month interval and then correlated. To assess convergent validity of the ERI, responses for both individuals with SAD and HC ($n=81$) were correlated with the measures described above. To examine group differences in emotion regulation frequency and self-efficacy, ERI responses of HC and SAD participants were compared for each of the ERI subscales. Because ERI responses for the two idiographic situations were correlated, they were combined by averaging the two sets of responses.

Results

Reliability and Validity of the ERI

Reliability of the ERI was assessed by examining correlations between baseline and post-waitlist ERI responses for participants with SAD (n=14). Results were as follows: situation selection frequency (r=.70, p=.003), situation modification frequency (r=.66, p=.009), attention deployment frequency (r=.62, p=.010), cognitive regulation frequency (r=.73, p=.001), cognitive regulation self-efficacy (r=.68, p=.001), suppression frequency (r=.77, p<.001), and suppression self-efficacy (r=.69, p=.003).

With respect to convergent validity, as expected, ERI situation selection frequency was correlated with the LSAS avoidance subscale (r=.55, p<.001), and ERI attention deployment frequency was correlated with the RSQ distraction subscale (r=.25, p=.014). Also consistent with expectations, ERI cognitive regulation frequency was correlated with the ERQ cognitive reappraisal subscale (r=.27, p=.009), and ERI cognitive regulation self-efficacy was correlated with ERQ cognitive reappraisal self-efficacy (r=.30, p=.004). Similarly, ERI suppression frequency was correlated with the ERQ suppression subscale (r=.21, p=.046), and ERI suppression self-efficacy was correlated with ERQ suppression self-efficacy (r=.21, p=.045).

Emotion Regulation Frequency

To examine whether SAD and HC participants differed in emotion regulation frequency during the speech task, t-tests were performed which showed that, compared to HCs, individuals with SAD reported greater frequency of expressive suppression, $t(79)$=2.15, p=.04; η_p^2=0.06. There were no differences for attentional deployment or cognitive change (ps > .23). (See Fig. 1a). To examine whether SAD and HC participants differed in emotion regulation frequency during the idiographic situations, t-tests were performed which showed that compared to HCs, individuals with SAD reported greater use of situation selection, $t(79)$=7.23, p<.001; η_p^2=0.40; and expressive suppression, $t(79)$=2.54, p=.013, η_p^2=0.08. There were no differences for situation modification, attentional deployment, or cognitive change (ps > .13). (See Fig. 1b).

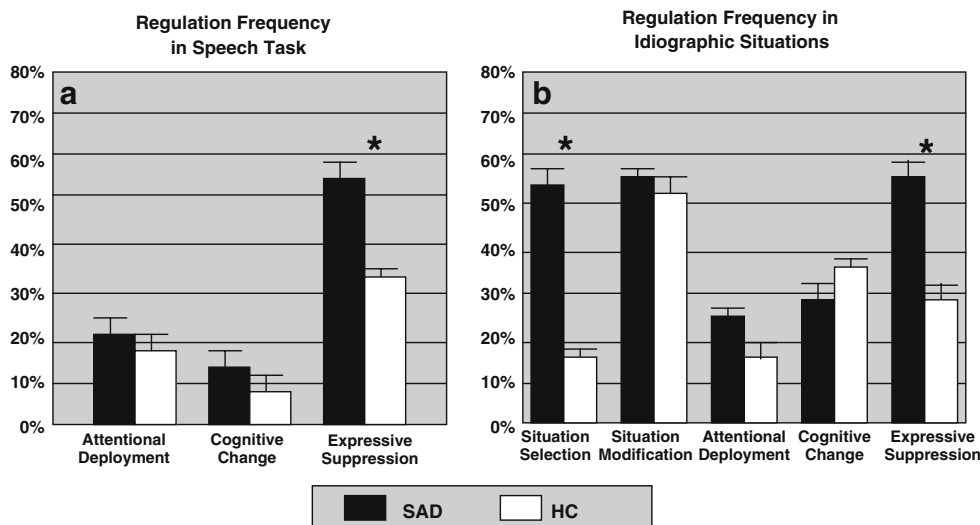### Emotion Regulation Self-Efficacy

To examine whether SAD and HC participants differed in their emotion regulation self-efficacy during the speech task, t-tests were performed which showed that compared to HCs, individuals with SAD reported feeling less self-efficacy when implementing cognitive change, $t(79)$= 3.34, p=.001; η_p^2=0.12 and expressive suppression, $t(79)$=3.23, p=.002; η_p^2=0.12. (See Fig. 2a). To examine whether SAD and HC participants differed in their emotion regulation during the idiographic situations t-tests were performed which showed that, compared to HCs, individuals with SAD reported less self-efficacy when implementing cognitive change, $t(79)$=27.89, p<.01, η_p^2=0.26, or when implementing expressive suppression, $t(79)$=4.46, p=.04, η_p^2=0.05. (See Fig. 2b).

### Secondary Analyses

Individuals with SAD reported significantly more social anxiety than HCs on the speech task and the two idiographic situations: speech task $t(79)$=9.83, p<.001; [SAD: M=55.52, SD=19.07; HC: M=15.8, SD=15.8]; idiographic situations, $t(79)$=3.57, p = .001; [SAD: M= 72.0, SD=12.3; HC: M=61.9, SD=12.8]. To determine

Fig. 1 Emotion regulation strategy frequency for (a) speech task and (b) idiographic situations (*p<.05)

**Regulation Self-efficacy
in Speech Task**

**Regulation Self-efficacy
in Idiographic Situations**
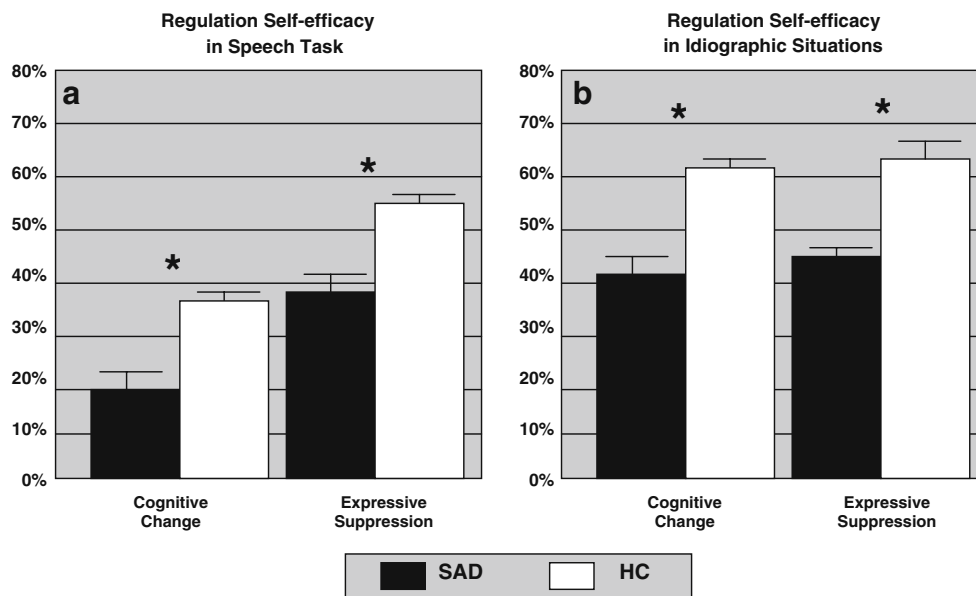
Fig. 2 Emotion regulation strategy self-efficacy for (**a**) speech task and (**b**) idiographic situations (*$p<.05$)

whether the emotion regulation findings were due to group differences in anxiety levels, the analyses described above were repeated, this time using the SUDS rating as a covariate were conducted. The significant differences between groups were unchanged.

Discussion

Individuals with SAD endure excessive fear of social situations, yet the role that emotion dysregulation plays in this disorder is not fully understood. In this study, a theoretically derived Emotion Regulation Interview was developed in order to better understand emotion regulation in SAD. Specifically, different forms and facets of emotion regulation during both idiographic and speech contexts were used.

Emotion Regulation Frequency in SAD

The current study confirms the prominent place of *situation selection* in SAD. For anxiety situations of similar intensity, the current study demonstrates that individuals with SAD avoid more readily than HCs. Avoidance is a core feature of SAD and is included in the diagnostic criteria for the disorder (Di Nardo et al. 1993), and our finding clarifies that a tendency to avoid persists even when controlling for anxiety severity. Other researchers have also indicated the central role avoidance plays in SAD (Asendorpf 1990; Rapee 1995). Avoidance provides immediate relief from social anxiety, but its long-term consequences can lead to

an impoverished life in social and work domains (Furmark 2002; Hofmann et al. 2004).

We found that HCs and people with SAD reported using *situation modification* at similar frequencies in anxiety provoking situations. Many situation modification strategies (e.g., safety behaviors) are maladaptive in that they prohibit full exposure to the feared social situations thereby preventing effective processing of the emotional information (Clark 2001). Yet situation modification includes adaptive strategies as well, such as: speaking with a confident voice, infusing humor, engendering social support for nervousness or directing the situation. A difference between groups was likely not seen for situation modification as this category contained both adaptive and maladaptive strategies.

Interestingly, the two groups also did not differ in their frequency of *attention deployment* (i.e., distraction). Much of the research on attention and SAD to date is on a short time-scale and has demonstrated an immediate attentional avoidance response upon the detection of a social threat (Bögels and Mansell 2004; Gilboa-Schechtman et al. 1999). The current study indicates that more active, conscious, and prolonged distraction techniques (e.g., focusing on smartphone in a group conversation) may be comparable when persons with SAD and HCs are faced with social threat.

The current study also found that SAD and HC used *cognitive reappraisal* with similar frequency. Although unexpected, this finding does correspond with some recent evidence. Researchers have found that both SAD and HC were able to use cognitive reappraisal to decrease negative emotion in an fMRI study indicating some equivalence in

these two groups' implementation abilities (Goldin, et al. 2009). Furthermore, in studies of anxious children and adolescents it has been shown that reappraisal effectively reduced negative emotion for both anxious and non-anxious children, and its efficacy did not differ between the two groups (Carthy, Horesh, Apter, Edge et al. 2010; Carthy, Horesh, Apter, and Gross 2010).

The present findings converge with prior theoretical (Mennin et al. 2002), experimental (Gross and John 2003), and clinical (Campbell-Sills et al. 2006) investigations in suggesting that use of *emotion suppression* is elevated in anxiety disordered populations. For example, one study showed that individuals with SAD believe that emotional expression is inappropriate and must be controlled, and this belief partially mediated the association between SAD and expressive suppression (Spokas et al. 2009). In a laboratory emotion induction, participants with mixed anxiety disorders endorsed more expressive suppression (Campbell-Sills and Barlow 2007), indicating the importance of over-use of expressive suppression in this clinical context.

Emotion Regulation Self-Efficacy in SAD

Individuals with SAD had lower self-efficacy when using cognitive change and expressive suppression than HCs. This may be due to a deficit in the efficacy of these strategies or to the perception that the strategies were not successful (or both). There is evidence that, when cued, individuals with SAD are able to implement cognitive change strategies and thereby decrease their negative emotional experience (Goldin, et al. 2009). This suggests that, although emotion regulation ability may be intact, the perception of one's actual emotion regulation efficacy may be distorted in SAD.

In gaining a fuller understanding of emotion regulation in SAD, it is important to consider the broader context in which emotion regulation abilities lie. The current study focuses on emotion regulation, a sub-category of the broader construct of emotional competence. Emotional competence refers to how effectively people deal with emotions and emotionally charged problems (Ciarrochi et al. 2003; Saarni 1999) and its two main components include: 1) the ability to identify one's own emotions, and 2) the ability to manage one's emotions. In the current study, our focus was on emotion management. It is also important to note that individuals with SAD may be lacking in their ability to be aware of and identify their emotions. One study showed that people with SAD are less able to pay attention to their emotions, and have more difficulty describing their emotions than controls (Turk et al. 2005). Therefore the emotion difficulties experienced by individuals with SAD may include deficits in awareness of their own emotional states, as well as in the ability to regulate emotions.

Implications for Basic Research, Assessment, and Treatment

To date, the study of emotion regulation has largely relied upon self-report assessments constrained to a limited range of strategies that are not anchored to specific life events, such as the Emotion Regulation Questionnaire (Gross and John 2003), the Difficulties in Emotion Regulation Scale (DERS; Gratz and Roemer 2004), and the Negative Mood Regulation Scale (NMR; Catanzaro and Mearns 1990).

The ERI quantifies frequency and self-efficacy of multiple, distinct emotion regulation strategies and thus provides a more refined assessment and classification of real-life emotion regulation strategies. In conducting these interviews, we found that participants occasionally offered responses that did not match the emotion regulation category under investigation. Given the interview format, in these cases, the interviewer was able to offer prototypical examples of the category in question and the participants were better able to determine whether they used that particular category or not. Because there is no such opportunity for clarification when completing questionnaires, this represents a clear advantage for the ERI approach to assess ER strategies.

Using the ERI, it was observed that individuals with SAD use overlapping yet differentiable constellations of adaptive and maladaptive emotion regulation strategies. For instance, to cope with a work meeting, one person with SAD may favor mental avoidance (attentional deployment) whereas another will over-prepare (situation modification). Another may clench his jaw, shoulders, and hands in attempt to hide his anxiety (expressive suppression). Using tools such as the ERI to understand which combination of strategies individual clients favor may be useful for clinicians to identify specific therapeutic techniques that directly target dysfunctional strategies such as mindfulness for those who inflexibly rely on attentional deployment or acceptance for those who over-use expressive suppression.

Additionally, this interview is not limited to use with SAD. It could potentially be modified for use with different emotions (other negative or even positive emotions), psychological disorders (e.g., substance abuse, eating disorders, depression), and developmental stages (e.g., children, adolescents, the elderly). Such extensions would provide a clearer understanding of emotion regulation in healthy and clinical samples and inform our understanding and treatment of emotional disorders.

Limitations and Future Directions

Although this study assessed each of the five major types of emotion regulation strategies postulated by Gross, in the future it will be important to make even more specific

distinctions among emotion regulation strategies. For example, it is possible that HCs use situation modification just as frequently as people with SAD, but people with SAD use more safety behaviors (Clark and McManus 2002). Future research should investigate subcategories of situation modification, attentional deployment and cognitive change to see if there are more specific deficits in SAD and to further examine the adaptive and maladaptive variants within each subcategory.

The data gathered in the current study are based on participants' own reports of their emotion regulatory strategy usage. The degree to which individuals are conscious of attentional or cognitive shifts to regulate their emotions is unknown. This is a concern as one study showed that individuals with SAD are less aware of their emotions than healthy controls (Turk et al. 2005). The task of adequately assessing regulatory self-efficacy is a difficult one; however, the ERI does an adequate job of addressing this by requiring individuals to provide concrete, objective examples of using the regulatory strategies. Trained interviewers facilitating the session are then able to further clarify with individuals about the use of their strategies and the appropriate categories of the objective behaviors. Future versions of the ERI could add self-efficacy measures for the other emotion regulation strategies. Furthermore, it should be noted that although self-report data provide valuable insights into emotion regulation behavior across situations and over time, relying on a single type of data may lead to inflated estimates of relations among measures via common method variance.

In a related vein, the ERI does not distinguish between actual and perceived efficacy, and future studies should attempt to do so. Actual efficacy at cognitive change could be measured by reduction in anxiety ratings or observer ratings of the types of cognitive reframes used. Similarly, actual efficacy of expressive suppression could be determined by observer ratings of videotaped social situations.

It bears noting that although the convergent associations of the ERI with related measures were significant, they were modest rather than substantial in size. Our interpretation of these modest correlations is that the ERI asks about specific situations and the questionnaire measures ask about strategy use more generally across many different situations across time. These modest correlations were well within the range of what would be expected (Mischel 1968), and of course in future work it will be important to extend the convergent validity to other measures. Furthermore, divergent validity data was not collected in the current study. Future work could assess how strongly the ERI is correlated to measures of related but distinct factors such as emotional expressivity or emotional knowledge.

The participant exclusion criteria were dictated by a larger study, and although they were appropriate for our data collection purposes, excluding these individuals may limit the generalizability of the current findings. Future research may benefit by including a broader range of individuals, including individuals with other Axis I and Axis II disorders.

The current study was able to determine emotion regulation abnormalities over and above emotional reactivity differences. Future research should look more specifically at the links between reactivity and regulation. For instance, anecdotal reports from the interview indicated higher anxiety may call for less effortful emotion regulation strategies (situation selection or situation modification), and lower anxiety situations may allow for more cognitively demanding strategies such as cognitive change. This suggests the possible utility of a graduated approach to the teaching of emotion regulation skills, starting with less anxiety-evoking situations and moving to more anxiety-provoking situations. Finally, future studies could look to see if a particular ER profile or response style predicts treatment outcome and symptom severity.

References

Asendorpf, J. (1990). The expression of shyness and embarrassment. In W. R. Crozier (Ed.), *Shyness and Embarrassment: Perspectives from social psychology* (pp. 87–118). Cambridge: Cambridge University Press.

Baker, S. L., Heinrich, N., Kim, H.-J., & Hoffman, S. G. (2002). The Liebowitz Social Anxiety Scale as a self-report instrument: A preliminary psychometric analysis. *Behaviour Research and Therapy, 40*, 1087–1098.

Bögels, S. M., & Mansell, W. (2004). Attention processes in the maintenance and treatment of social phobia: Hypervigilance, avoidance and self-focused attention. *Clinical Psychology Review, 24*, 827–856.

Campbell-Sills, L., & Barlow, D. H. (2007). Incorporating emotion regulation into conceptualizations and treatments of anxiety and mood disorders. In J. J. Gross (Ed.), *Handbook of emotion regulation* (pp. 542–559). New York: Guilford.

Campbell-Sills, L., Barlow, D. H., Brown, T. A., & Hofmann, S. G. (2006). Acceptability and suppression of negative emotion in anxiety and mood disorders. *Emotion, 6*, 587–595.

Carthy, T., Horesh, N., Apter, A., Edge, M. D., & Gross, J. J. (2010). Emotional reactivity and cognitive regulation in anxious children. *Behaviour Research and Therapy, 48*, 384–393.

Carthy, T., Horesh, N., Apter, A., & Gross, J. J. (2010). Patterns of emotional reactivity and regulation in children with anxiety disorders. *Journal of Psychological Behavioral Assessment, 32*, 23–36.

Catanzaro, S. J., & Mearns, J. (1990). Measuring generalized expectancies for negative mood regulation: Initial scale development and implications. *Journal of Personality Assessment, 54*, 546–563.

Ciarrochi, J., Scott, G., Deane, F., & Heaven, P. (2003). Relations between social and emotional competence and mental health: A construct validation study. *Personality and Individual Differences, 38*, 1947–1963.

Clark, D. M. (2001). A cognitive perspective on social phobia. In W. R. Crozier & L. E. Alden (Eds.), *International handbook of social anxiety: Concepts, research and interventions relating to the self and shyness* (pp. 405–430). Chichester: Wiley.

Clark, D. M., & McManus, F. (2002). Information processing in social phobia. *Biological Psychiatry, 51*, 92–100.

Di Nardo, P., Moras, K., Barlow, D. H., Rapee, R. M., & Brown, T. A. (1993). Reliability of DSM-III-R anxiety disorder categories. Using the Anxiety Disorders Interview Schedule-Revised (ADIS-R). *Archives of General Psychiatry, 50*, 251–256.

Di Nardo, P. A., Brown, T. A., & Barlow, D. H. (1994). *Anxiety disorders interview schedule for DSM-IV: Lifetime version (ADIS-IV-L)*. New York: Oxford University Press.

Etkin, A., & Wager, T. D. (2007). Functional neuroimaging of anxiety: A meta-analysis of emotional processing in PTSD, social anxiety disorder, and specific phobia. *The American Journal of Psychiatry, 164*, 1476–1488.

Fresco, D. M., Coles, M. E., Heimberg, R. G., Liebowitz, M. R., Hami, S., Stein, M. B., et al. (2001). The Liebowitz Social Anxiety Scale: A comparison of the psychometric properties of self-report and clinician-administered formats. *Psychological Medicine, 31*, 1025–1035.

Furmark, T. (2002). Social phobia: Overview of community surveys. *Acta Psychiatrica Scandinavica, 105*, 84–93.

Gilboa-Schechtman, E., Foa, E. B., & Amir, N. (1999). Attentional biases for facial expressions in social phobia: The face-in-the-crowd paradigm. *Cognition & Emotion, 13*, 305–318.

Goldin, P. R., Manber, T., Hakimi, S., Canli, T., & Gross, J. J. (2009). Neural bases of social anxiety disorder: Emotional reactivity and cognitive regulation during social and physical threat. *Archives of General Psychiatry, 66*, 170–180.

Gratz, K. L., & Roemer, L. (2004). Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the Difficulties in Emotion Regulation Scale. *Journal of Psychopathology and Behavioral Assessment, 36*, 41–54.

Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology, 2*, 271–299.

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.

Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (1999). *Acceptance and commitment therapy: An experiential approach to behavior change*. New York: Guilford.

Heimberg, R. G. (2002). Cognitive-behavioral therapy for social anxiety disorder: Current status and future directions. *Biological Psychiatry, 51*, 101–108.

Heimberg, R. G., Horner, K. J., Juster, H. R., Safren, S. A., Brown, E. J., Schneier, F. R., et al. (1999). Psychometric properties of the Liebowitz Social Anxiety Scale. *Psychological Medicine, 29*, 199–212.

Hermann, C., Ofer, J., & Flor, H. (2004). Covariation bias for ambiguous social stimuli in generalized social phobia. *Journal of Abnormal Psychology, 113*, 646–653.

Hofmann, S. G. (2004). Cognitive mediation of treatment change in social phobia. *Journal of Consulting and Clinical Psychology, 72*, 393–399.

Hofmann, S. G., Heinrichs, N., & Moscovitch, D. A. (2004). The nature and expression of social phobia: Toward a new classification. *Clinical Psychology Review, 24*, 769–797.

Kashdan, T. B. (2007). Social anxiety spectrum and diminished positive experiences: Theoretical synthesis and meta-analysis. *Clinical Psychology Review, 27*, 348–365.

Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., & Walters, E. E. (2005). *Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Rreplication*. American Medical Association.

Kring, A. M., & Werner, K. H. (2004). Emotion regulation and psychopathology. In P. Philippot & R. S. Feldman (Eds.), *The Regulation of emotion* (pp. 359–385). New York: Routledge.

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

Linehan, M. M. (1993). *Cognitive-behavioral treatment of borderline personality disorder*. New York: Guilford.

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.

Mischel, W. (1968). *Personality and assessment*. New York: Wiley.

Nolen-Hoeksema, S., & Morrow, J. (1991). A prospective study of depression and posttraumatic stress symptoms after a natural disaster: The 1989 Loma Prieta earthquake. *Journal of Personality and Social Psychology, 61*, 115–121.

Rapee, R. M. (1995). Descriptive psychopathology of social phobia. In R. G. Heimberg (Ed.), *Social phobia: Diagnosis, assessment, and treatment* (pp. 41–66). New York: Guilford.

Rytwinski, N. K., Fresco, D. M., Heimberg, R. G., Coles, M. E., Liebowttitz, M. R., Cissell, S., et al. (2009). Screening for social anxiety disorder with the self-report version of the Liebowitz Social Anxiety Scale. *Depression and Anxiety, 26*, 34–38.

Saarni, C. (1999). *The development of emotional competence*. New York: The Guilford.

Schneier, F. R., Johnson, J., Hornig, C. D., Liebowitz, M. R., & Weissman, M. M. (1992). Social phobia. Comorbidity and morbidity in an epidemiologic sample. *Archives of General Psychiatry, 49*, 282–288.

Spokas, M., Luterek, J. A., & Heimberg, R. G. (2009). Social anxiety and emotional suppression: The mediating role of beliefs. *Journal of Behavior Therapy and Experimental Psychiatry, 40*, 283–291.

Turk, C. L., Heimberg, R. G., Luterek, J. A., Mennin, D. S., & Fresco, D. M. (2005). Emotion dysregulation in generalized anxiety disorder: A comparison with social anxiety disorder. *Cognitive Therapy and Research, 29*, 89–106.

Weeks, J. W., Heimberg, R. G., Fresco, D. M., Hart, T. A., Turk, C. L., Schneier, F. R., et al. (2005). Empirical validation and psychometric evaluation of the Brief Fear of Negative Evaluation Scale in patients with social anxiety disorder. *Psychological Assessment, 17*, 179–190.

Wells, A., & Papageorgiou, C. (1998). Social phobia: Effects of external attention on anxiety, negative beliefs, and perspective taking. *Behavior Therapy, 29*, 357–370.

Werner, K. W., & Gross, J. J. (2009). Emotion regulation and psychopathology: A conceptual framework. In A. Kring & D. Sloan (Eds.), *Emotion regulation and psychopathology*. New York: Guilford.

Wolpe, J. (1958). *Psychotherapy by reciprocal inhibition*. Palo Alto: Stanford University Press.