

Cognitive Reappraisal Self-Efficacy Mediates the Effects of Individual Cognitive-Behavioral Therapy for Social Anxiety Disorder

Philippe R. Goldin, Michal Ziv, Hooria Jazaieri,
and Kelly Werner
Stanford University

Helena Kraemer
Stanford Medical School

Richard G. Heimberg
Temple University

James J. Gross
Stanford University

Objective: To examine whether changes in cognitive reappraisal self-efficacy (CR-SE) mediate the effects of individually administered cognitive-behavioral therapy (I-CBT) for social anxiety disorder (SAD) on severity of social anxiety symptoms. **Method:** A randomized controlled trial in which 75 adult patients (21–55 years of age; 53% male; 57% Caucasian) with a principal diagnosis of generalized SAD were randomly assigned to 16 sessions of I-CBT ($n = 38$) or a wait-list control (WL) group ($n = 37$). All patients completed self-report inventories measuring CR-SE and social anxiety symptoms at baseline and post-I-CBT/post-WL, and I-CBT completers were also assessed at 1-year posttreatment. **Results:** Compared with WL, I-CBT resulted in greater increases in CR-SE and greater decreases in social anxiety. Increases in CR-SE during I-CBT mediated the effect of I-CBT on social anxiety. Gains achieved by patients receiving I-CBT were maintained 1-year posttreatment, and I-CBT-related increases in CR-SE were also associated with reduction in social anxiety at the 1-year follow-up. **Conclusions:** Increasing CR-SE may be an important mechanism by which I-CBT for SAD produces both immediate and long-term reductions in social anxiety.

Keywords: social anxiety, cognitive-behavioral therapy, emotion regulation, cognitive reappraisal, self-efficacy

Social anxiety disorder (SAD) is highly prevalent (12.1%; Kessler et al., 2005); has an early onset (Otto et al., 2001); has low rates of remission (Keller, 2003); is associated with significant impairment in social, educational, and occupational functioning (Stein & Kean, 2000); and results in substantial societal burden (Acarturk et al., 2009). SAD is characterized by excessive fear of humiliation and embarrassment (Stein & Stein, 2008). Recent studies have demonstrated that SAD is associated with exaggerated emotional reactivity and deficits in cognitive forms of emotion regulation (Goldin, Manber, Hakimi, Canli, & Gross, 2009; Goldin, Manber-Ball, Werner, Heimberg, & Gross, 2009). Although several psychosocial and pharmacological treatments are available for SAD, one of the most promising is cognitive-behavioral therapy (CBT).

CBT for SAD

CBT (Beck, Emery, & Greenberg, 1985) is an empirically supported psychosocial intervention for anxiety disorders. Evidence suggests that individually administered forms of CBT (I-CBT) for SAD (Clark, 2001; Hope, Heimberg, Juster, & Turk, 2000) are efficacious (Ledley et al., 2009), equal to (Fedoroff & Taylor, 2001) or more efficacious (Stangier, Heidenreich, Peitz, Lauterbach, & Clark, 2003) than group-administered CBT, and superior to combinations of fluoxetine and self-exposure (Clark et al., 2003), exposure and applied relaxation (Clark et al., 2006), and routine psychiatric treatment with medication and emotional support (Mörtberg, Clark, Sundin, & Wistedt, 2007).

Cognitive models of SAD (Clark & Wells, 1995; Heimberg, Brozovich, & Rapee, 2010; Hofmann, 2007) suggest that a key component of CBT is training patients to restructure distorted beliefs during exposure to feared social situations. Cognitive restructuring directly counters emotion dysregulation, which has been identified as a fundamental feature of mood and anxiety disorders (Campbell-Sills & Barlow, 2007). One crucial component of cognitive restructuring is thought to be cognitive reappraisal (CR), which involves modifying the meaning of a stimulus or context that gives rise to an emotion. CR can modify emotional reactions to stressful, anxiety-provoking situations and can lead to psychological flexibility and emotional well-being (Gross, 2007).

This article was published Online First May 14, 2012.

Philippe R. Goldin, Michal Ziv, Hooria Jazaieri, and Kelly Werner, Department of Psychology, Stanford University; Helena Kraemer, Department of Psychiatry, Stanford Medical School; Richard G. Heimberg, Department of Psychology, Temple University; James J. Gross, Department of Psychology, Stanford University.

This research was supported by a National Institute of Mental Health Grant R01 MH076074, awarded to James J. Gross. Richard Heimberg is the author of the commercially available protocol that was used in this study. None of the other authors have any direct or indirect conflicts of interest, financial or personal relationships, or affiliations to disclose.

Correspondence concerning this article should be addressed to Philippe R. Goldin, Stanford University, Department of Psychology, Jordan Hall, 450 Serra Mall, Stanford, CA 94305-2130. E-mail: pgoldin@stanford.edu

CR Self-Efficacy in SAD

Self-efficacy beliefs have been linked to motivation (Bandura & Cervone, 1986), cognitive and behavioral change (Bandura, 1977), and enhanced affect regulation and psychosocial functioning (Bandura, Caprara, Barbaranelli, Gerbino, & Pastorelli, 2003). One particular type of self-efficacy is CR self-efficacy (CR-SE), which refers to the belief that one can successfully implement CR when one wishes to regulate one’s emotions (Goldin et al., 2009).

Compared with healthy control participants, patients with SAD have shown deficits in CR ability (Goldin, Manber, et al., 2009; Goldin, Manber-Ball, et al., 2009) as well as lower levels of CR self-efficacy (Goldin, Manber-Ball, et al., 2009; Werner, Goldin, Ball, Heimberg, & Gross, 2011). In socially anxious individuals, lower self-efficacy predicts poorer behavioral performance in speech tasks (Rodebaugh, 2006) and greater subjective anxiety and poorer perceived performance in social role play tests (Gaudiano & Herbert, 2007). Lower self-efficacy is related to greater severity of social anxiety and is believed to increase the use of dysfunctional strategies for coping with anxiety in social situations (Thomasson & Psouni, 2010). Although deficits in CR-SE have been documented in both children and adults with anxiety disorders (Carthy, Horesh, Apter, & Gross, 2010; Goldin, Manber-Ball, et al., 2009; Werner et al., 2011), and changes in self-efficacy during CBT have been associated with treatment outcome in both adolescent (Gaudiano & Herbert, 2007) and adult SAD (Delsignore, Carraro, Mathier, Znoj, & Schnyder, 2008), the extent to which CBT enhances CR-SE and how changes in CR-SE are related to immediate and longer term changes in severity of social anxiety symptoms in patients with SAD is not known.

The Present Study

Our aim was to examine whether changes in CR-SE mediate the effects of I-CBT (vs. a wait-list [WL] control) on social anxiety symptoms. We used a recently formulated approach to investigate

potential mediation (Kraemer, Kiernan, Essex, & Kupfer, 2008). We expected that (a) compared with WL, I-CBT would result in significantly increased CR-SE and reduced social anxiety and (b) increased CR-SE during I-CBT would explain the change in severity of social anxiety. We expected to observe (c) maintenance of I-CBT treatment gains at 1-year posttreatment and tested whether CBT-related increases in CR-SE were associated with these effects.

Method

Participants

Patients were recruited for a randomized controlled trial of I-CBT for SAD. After screening 436 potential patients, 110 completed a diagnostic interview to determine clinical status (see Figure 1), and 35 were excluded due to current pharmacotherapy or psychotherapy; past CBT; history of medical disorders or head trauma (because functional magnetic resonance imaging was used in other portions of the study not reported here); and current major depressive disorder and bipolar affective, substance abuse, post-traumatic stress, obsessive-compulsive, or thought disorders, or incomplete baseline assessments. The remaining 75 patients who met *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition (*DSM-IV*; American Psychiatric Association, 1994) criteria for a principal diagnosis of generalized SAD were randomly assigned to either immediate I-CBT for SAD ($n = 38$) or a WL control group ($n = 37$) who were offered I-CBT after the waiting period (see Table 1 for demographics and psychiatric comorbidity). WL patients entered I-CBT after completing WL. Thus, there is no 1-year post-WL assessment for these patients. The study was approved by the Institutional Review Board (IRB) of Stanford University.

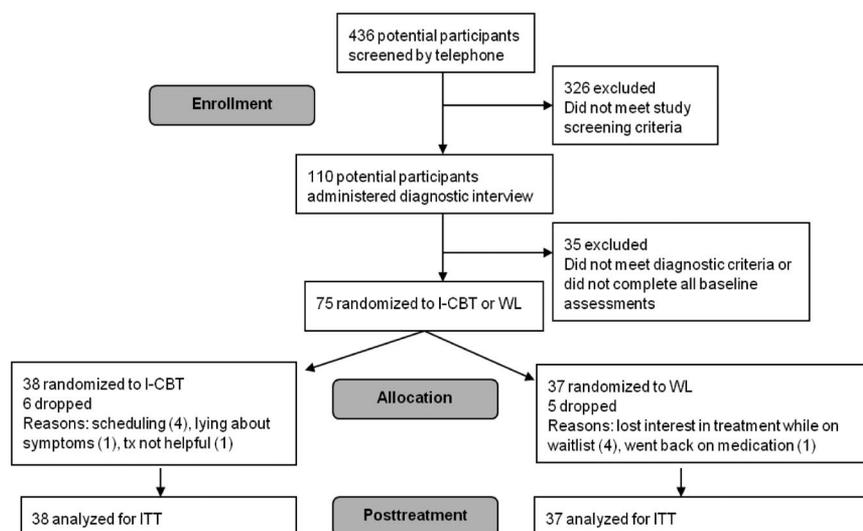


Figure 1. Consolidated standards of reporting trials diagram for a randomized controlled trial of individual cognitive-behavioral therapy (I-CBT) versus wait-list (WL) control. ITT = intent-to-treat analyses; tx = treatment.

Table 1
Participant Characteristics

Variable	I-CBT (<i>n</i> = 38)	WL (<i>n</i> = 37)	<i>t</i> or χ^2
Gender (males, <i>n</i> , %)	20 (52.6%)	20 (55.6%)	$\chi^2 = 0.24$
Age (years, <i>M</i> \pm <i>SD</i>)	33.4 \pm 7.6	33.6 \pm 10.4	<i>t</i> = 0.12
Education (years, <i>M</i> \pm <i>SD</i>)	16.7 \pm 2.2	17.0 \pm 2.5	<i>t</i> = 0.55
Ethnicity (<i>n</i> , % Caucasian)	22 (57.9%)	21 (56.8%)	$\chi^2 = 0.41$
Yearly income (\$1,000s, <i>M</i> \pm <i>SD</i>)	73.5 \pm 45.7	56.6 \pm 43.7	<i>t</i> = 1.43
Marital status (<i>n</i> , %)			$\chi^2 = 0.78$
Single, never married	24 (63.2%)	27 (73.0%)	
Married	13 (34.2%)	7 (18.9%)	
Divorced, separated, widowed	1 (2.6%)	3 (8.1%)	
Current Axis I comorbidity (<i>n</i> , %)			$\chi^2 = 2.83$
Generalized anxiety disorder	6 (15.8%)	8 (21.6%)	
Specific phobia	4 (10.5%)	1 (2.7%)	
Panic disorder	2 (5.3%)	1 (2.7%)	
Dysthymic disorder	1 (2.6%)	2 (5.4%)	
Past Axis-I comorbidity (<i>n</i> , %)			$\chi^2 = 0.01$
Major depressive disorder	9 (23.7%)	7 (18.9%)	
Dysthymic disorder	0	1 (2.7%)	
Posttraumatic stress disorder	1 (2.6%)	0	
Panic disorder	0	1 (2.7%)	
Substance abuse disorder	2 (5.3%)	4 (10.8%)	
Eating disorder	0	1 (2.7%)	
Obsessive-compulsive disorder	0	1 (2.7%)	
Past non-CBT psychotherapy (<i>n</i> , %)	21 (52.5%)	15 (42.9%)	$\chi^2 = 1.92$
Past pharmacotherapy (<i>n</i> , %)	11 (28.9%)	14 (37.8%)	$\chi^2 = 1.15$
Age at symptom onset (years, <i>M</i> \pm <i>SD</i>)	13.2 \pm 7.9	13.0 \pm 6.1	<i>t</i> = 0.16
Years since symptoms onset (<i>M</i> \pm <i>SD</i>)	20.4 \pm 11.1	20.3 \pm 12.9	<i>t</i> = 0.02

Note. I-CBT = individual cognitive-behavioral therapy; WL = wait-list.

Procedure

Patients were recruited through clinician referrals and community bulletin boards. After determining eligibility and completing informed consent procedures, patients were randomly assigned to immediate I-CBT versus WL groups using a biased coin randomization (Efron, 1971) procedure that reduces potential confounds related to unequal group sizes at different time points during a longitudinal study. Doctoral-trained clinical psychologists conducted diagnostic interviews using the Anxiety Disorders Interview Schedule for DSM-IV (ADIS-IV; DiNardo, Brown, & Barlow, 1994), which has excellent interrater reliability (Brown, DiNardo, Lehman, & Campbell, 2001). Patients met diagnostic criteria for generalized SAD, defined as, based on rating scales in the ADIS-IV, greater than moderate fear for five or more distinct social situations and a clinician's severity rating of 4 or greater for SAD on these 0–8 scales.

Measures

To measure CR-SE, a scale derived from the Emotion Regulation Questionnaire (Goldin, Manber-Ball, et al., 2009; Gross & John, 2003) was used, which has good reliability and construct validity (Gross & John, 2003). The eight-item Self-Efficacy subscale measures self-efficacy of cognitive reappraisal during the last month. A 7-point Likert-type scale is used for rating "How capable you are of using reappraisal when you want to. . .?", with a range from 1 (*strongly disagree*) to 7 (*strongly agree*) for each statement (e.g., "Control my emotions by changing the way I think about the situation I'm in"). Ratings are summed for a total score (range =

8–56). Cronbach's alpha for the Self-Efficacy subscale was .95 in this study.

To measure severity of social anxiety, the 24-item Liebowitz Social Anxiety Scale-Self-Report (LSAS-SR; Fresco et al., 2001; Liebowitz, 1987) was used, which consists of questions that assess social interaction situations (11 items) and performance situations (13 items). A 4-point Likert-type scale is used for ratings of fear and of avoidance, with a range from 0 (*none* and *never*, respectively) to 3 (*severe* and *usually*, respectively) for situations during the past week. Ratings are summed for a total LSAS-SR score (range = 0–144). The LSAS-SR has excellent reliability and construct validity (Baker, Heinrichs, Kim, & Hofmann, 2002), and its internal consistency was excellent in this study (Cronbach's $\alpha = .91$).

I-CBT for SAD

I-CBT was delivered using "Managing Social Anxiety: A Cognitive-Behavioral Therapy Approach", a manualized treatment protocol which included a therapist guide (Hope, Heimberg, & Turk, 2006) and a client workbook (Hope et al., 2000) and consisted of 16 individual 1-hr sessions (except for the first in-session exposure session, which lasted 1.5 hr) administered over 4 months. The treatment covers (a) psychoeducation and orientation to CBT; (b) cognitive restructuring skills; (c) graduated exposure to feared social situations, both within session and in vivo as homework; (d) examination and modification of core beliefs; and (e) relapse prevention and termination.

All four study therapists had to achieve proficiency in implementing I-CBT with training cases prior to treating study patients.

Therapists were trained and supervised by Richard Heimberg, an expert in CBT for SAD and one of the developers of the treatment protocol used here. All 16 therapy sessions for each client were digitally recorded and rated on several items by a team of independent raters familiar with CBT for SAD. Raters used a 5-point Likert-type scale ranging from 1 (*ineffective*) to 5 (*extremely effective*) for treatment adherence using the “Cognitive-Behavioral Therapy for Social Anxiety Disorder: Therapist Adherence Scale” (Hope, VanDyke, Heimberg, Turk, & Fresco, 2001). Because there were multiple raters who provided the ratings of the five components per therapy case, a one-way random effects model was used with absolute agreement to compute the average measures intraclass correlation (.81). Ratings for each of the five components had to be ≥ 4 to be considered “in protocol.” The four therapists achieved this standard (overall $M = 4.61$, $SD = 0.24$), and a one-way analysis of variance (ANOVA) showed no differences among therapists, $F(3, 33) = 0.11$, $p = .96$.

Statistical Analysis

The primary analysis was the intent-to-treat (ITT) analysis, using the last observation carried forward method to account for missing data at post-CBT/WL. A per-protocol treatment completer analysis was also conducted, although the advantages of randomization are lost here. To investigate the overall treatment effect of I-CBT versus WL, a two-sample t test examining pre–post treatment change was used. Effect sizes are reported as Cohen’s d (Cohen, 1988), partial eta square (η_p^2) (Pierce, Block, & Aguinis, 2004) with 95% exact confidence intervals (CIs; Odgaard & Fowler, 2010), and *success rate difference* (SRD), defined as the difference between the probabilities that a randomly chosen patient from I-CBT will have a response preferable to a randomly chosen patient from WL and, the reverse, that the WL patient will have a response preferable to the I-CBT patient. SRD ranges from +1 (if every patient treated with I-CBT has a clinically preferable response to every patient in the WL) to –1 (if the reverse is true) with null value = 0. If the assumptions underlying Cohen’s d apply, then $SRD = 2\Phi(d/\sqrt{2}) - 1$, where $\Phi(d/\sqrt{2})$ is the standard normal distribution function.

To investigate whether changes in CR-SE mediate the effect of I-CBT on social anxiety symptoms, a mediation analysis (Kraemer et al., 2008) was conducted using a linear model that included the main effects of treatment group (G) and mediator (M), as well as the $G \times M$ interaction. G, the treatment group assigned at baseline, was coded as 0.5 and –0.5. The pre-to-post change in M temporally followed G, and the outcome variable (O) was measured after treatment completion. M was centered at zero (i.e., the value it has pretreatment) to make the standardized coefficient beta values (β) more interpretable. To show mediation, it must be demonstrated that G and M are correlated and that in the linear model, either the main effect of M or the interactive effect of $G \times M$ is statistically significant. Only treatment completer data were used to assure temporal precedence.

Results

Preliminary Analyses

Patients in the I-CBT and WL groups did not differ significantly in sex, age, education, ethnicity, yearly income, marital status,

current or past Axis I comorbidity, past psychotherapy or pharmacotherapy, age at onset, and years since onset (see Table 1). Six patients (16%) dropped during immediate I-CBT,¹ and five patients (14%) dropped during WL.

I-CBT Overall Effects on CR-SE and Social Anxiety

ITT analysis. The 2 (group: I-CBT, WL) \times 2 (time: baseline, posttreatment) repeated measures ANOVA yielded significant interactions of Group \times Time for social anxiety, $F(2, 73) = 20.0$, $p < .001$, $d = 1.05$, $\eta_p = .21$, 95% CI [.19, .65], and CR-SE, $F(2, 67) = 15.3$, $p < .001$, $d = 0.96$, $\eta_p = .19$, 95% CI [.13, .53] (see Table 2). To examine differential pre-to-post change, we conducted two-sample t tests. Compared with WL, I-CBT resulted in greater decreases in social anxiety (I-CBT Δ LSAS-SR = –29.65, $SD = 26.66$; WL Δ LSAS-SR = –8.18, $SD = 12.39$), $t(75) = 4.47$, $p < .001$, $d = 1.03$, SRD = 0.78, and greater increases in CR-SE (I-CBT Δ CR-SE = 9.0, $SD = 11.94$; WL Δ CR-SE = –1.77, $SD = 10.62$), $t(66) = 3.87$, $p < .001$, $d = 0.95$, SRD = 0.27.

Completers analysis. The same analysis in treatment completers resulted in similar interactions of Group \times Time for social anxiety, $F(2, 57) = 31.0$, $p < .001$, $d = 1.48$, $\eta_p = .35$, 95% CI [.32, .64], and CR-SE, $F(2, 45) = 26.1$, $p < .001$, $d = 1.52$, $\eta_p = .37$, 95% CI [.31, .66] (see Table 2). Two-sample t tests showed that, compared with WL, I-CBT resulted in greater decreases in social anxiety (I-CBT Δ LSAS-SR = –38.74, $SD = 26.12$; WL Δ LSAS-SR = –9.80, $SD = 12.45$), $t(57) = 5.57$, $p < .001$, $d = 1.41$, SRD = 0.83, and greater increases in CR-SE (I-CBT Δ CR-SE = 15.55, $SD = 12.03$; WL Δ CR-SE = –2.12, $SD = 11.84$), $t(45) = 5.11$, $p < .001$, $d = 1.48$, SRD = 0.14.

CR-SE as a Mediator of I-CBT and Changes in Social Anxiety

Using data from treatment completers only, as shown above, group assignment (G) at baseline to I-CBT versus WL was associated with differential change in CR-SE satisfying the first criterion for showing mediation. The linear regression, $F(3, 44) = 3.58$, $p = .022$, $R^2 = .21$, demonstrated a main effect of M (CR-SE), but no $G \times M$ interaction on post-CBT/WL social anxiety (see Table 3). Thus, the final criterion for mediation is satisfied. Moreover, the treatment effect on change in social anxiety, shown significant when CR-SE was ignored above, is now nonsignificant, indicating complete mediation. The effect size of the mediator far exceeded the main effect of treatment group (see Figure 2).

Longer Term I-CBT Effects

Paired t tests showed a small improvement on severity of social anxiety, $t(40) = 2.67$, $p = .01$, and no change in CR-SE, $t(29) = 0.53$, $p = .60$, from immediately post-I-CBT to 1-year thereafter. Thus, I-CBT-related gains were maintained up to 1-year post-I-CBT. We also observed that CR-SE measured immediately post-I-CBT was associated with reductions in social anxiety 1-year posttreatment, $r(37) = -.43$, $p = .008$.

¹ One patient was dropped during I-CBT after determining that he lied about his symptoms.

Table 2

Means and Standard Deviations for Liebowitz Social Anxiety Scale-Self-Report and Cognitive Reappraisal Self-Efficacy at Pre- and Post-I-CBT and WL for Treatment Completer and Intent-to-Treat Samples

Variable	I-CBT (n = 38)	WL (n = 37)
LSAS-SR (M ± SD)		
Pre	88.3 ± 18.7	77.6 ± 17.0
Post (intent-to-treat)	58.7 ± 26.7	69.4 ± 19.2
Post (treatment completers)	49.0 ± 23.7	67.3 ± 19.4
1-year follow-up	44.0 ± 28.9	
CR-SE (M ± SD)		
Pre	27.0 ± 10.7	27.4 ± 10.6
Post (intent-to-treat)	36.1 ± 10.6	25.9 ± 11.6
Post (treatment completers)	41.2 ± 6.7	26.1 ± 12.1
1-year follow-up	38.8 ± 8.8	

Note. I-CBT = individual cognitive-behavioral therapy; WL = wait-list; LSAS-SR = Liebowitz Social Anxiety Scale-Self-Report; CR-SE = cognitive reappraisal self-efficacy.

Discussion

The primary goal of this study was to investigate whether treatment-related changes in CR-SE mediate the effect of I-CBT for SAD on social anxiety symptoms.

I-CBT for SAD

I-CBT reduced social anxiety symptoms at a level comparable to a prior study of I-CBT for SAD (Ledley et al., 2009). I-CBT effect sizes here exceeded those reported in a recent meta-analysis of a variety of psychological treatments for SAD ($d = 0.86$; Powers, Sigmarsson, & Emmelkamp, 2008). Importantly, social anxiety symptom reduction was maintained at 1-year post-I-CBT, converging with prior findings of maintenance of treatment gains (Clark et al., 2006, 2003; Ledley et al., 2009; Mörtberg et al., 2007; Stangier et al., 2003).

Other studies have found predictors of treatment outcome in SAD, including reductions in probability bias for negative social events (Smits, Rosenfield, McDonald, & Telch, 2006), self-focus, estimated probability and estimated cost of negative social events, safety behaviors (Hoffart, Borge, Sexton, & Clark, 2009), and anticipated aversive social outcomes (Hofmann, 2004). The present study showed that increases in CR-SE totally mediated the

Table 3

Cognitive Reappraisal Self-Efficacy Mediates the Effect of Individual Cognitive-Behavioral Therapy on the Severity of Social Anxiety Symptoms in Treatment Completers

Variable	B	SE B	β	p
LSAS-SR				
Intercept	66.36	4.17		
Group	-4.37	8.34	-.10	.60
Δ CR-SE	-.69	.25	-.48	.01
Group \times Δ CR-SE	-.33	.40	-.11	.51

Note. LSAS-SR = Liebowitz Social Anxiety Scale-Self-Report; CR-SE = cognitive reappraisal self-efficacy.

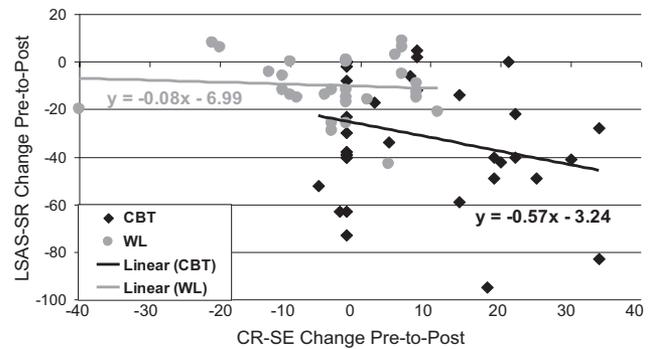


Figure 2. Relationship of pre-to-post changes in cognitive reappraisal self-efficacy (CR-SE) and the Liebowitz Social Anxiety Scale-Self-Report (LSAS-SR). Gray circles represent the wait-list (WL) control group; black diamonds represent individual cognitive-behavioral therapy (CBT).

effect of I-CBT on social anxiety reduction and that the mediator effect on improvement in social anxiety was about twice as large as the main effect of treatment group. Mediator specificity was indicated by (a) an increase in CR-SE from pre-to-post I-CBT and a slight decrease from pre-to-post WL and (b) no evidence that changes in social anxiety or the interaction of treatment group by changes in social anxiety mediated the effect of I-CBT on CR-SE. Additionally, increased CR-SE at post-I-CBT was associated with decreased social anxiety symptoms 1-year post-I-CBT completion.

The Role of CR-SE

One way to conceptualize the impact of I-CBT on CR-SE is that learning how to use CR during exposure to feared situations during CBT helps to recalibrate at least two dimensions of CR: strategic behavior (i.e., actual implementation of CR) and meta-cognition (i.e., belief in one's ability to implement CR). Both of these dimensions are explicitly trained during the cognitive restructuring module (two to three sessions) and during in-session and in vivo exposure exercises (last nine to 10 sessions) in the *Managing Social Anxiety* protocol (Hope et al., 2006). Enhancing CR-SE in patients with SAD may drive the increased use of CR in social situations, facilitating anxiety reduction. A recent functional magnetic resonance imaging study has demonstrated that increased CR-SE is associated with increased early recruitment of CR-related brain regions (Goldin, Manber-Ball, et al., 2009). Alternatively, in alignment with other conceptualizations of self-efficacy (Borkovec, 1978), increases in CR-SE following I-CBT in patients with SAD, may reflect, rather than cause, behavioral change.

Self-efficacy has been identified as an important predictor of treatment outcome for a variety of medical and psychiatric problems, for example, breast cancer (Rottmann, Dalton, Christensen, Frederiksen, & Johansen, 2010), osteoarthritis (Benyon, Hill, Zadorian, & Mallen, 2010), nicotine addiction (Schnoll et al., 2011), substance use (Kadden & Litt, 2011), bulimia nervosa (Steele, Bergin, & Wade, 2011), and arachnophobia (Côté & Bouchard, 2009). In the context of SAD, social self-efficacy (Gaudiano & Herbert, 2007) and therapy-specific self-efficacy (Delsignore et al., 2008) have been identified as predictors of CBT outcome. The

present study is the first to identify CR-SE as one important mediator of I-CBT.

Limitations and Future Directions

The focus of this study was on the role of CR-SE in mediating treatment outcome. Examination of I-CBT effects on the implementation of and self-efficacy regarding other emotion regulation strategies (e.g., expressive suppression, attention deployment) is necessary to determine the specificity of CR-SE as a mediator and whether changes in other emotion regulation strategies might be even more robust mediators of I-CBT outcome. In addition to self-report inventories, using experimental tasks that measure the impact of I-CBT on the implementation of different emotion regulation skills for both disorder-related and unrelated emotional probes will also be important in delineating what variables mediate or moderate treatment outcome and longer term maintenance of new skills. Measurement of changes in emotion regulation and self-efficacy in much finer resolution during CBT may help identify different temporal patterns of change. Because it was not done in this study, interrater reliability of clinical diagnoses should be assessed.

Future studies that compare CBT with other active interventions may help elucidate differential mechanisms for different treatment modalities. Also, examination of how CR-SE changes during CBT for other psychiatric disorders may elucidate the role played by specific emotion dysregulation difficulties in specific disorders. To understand the longer term effects of I-CBT, it will be important to maintain a control or comparison group and to compare responses at 12 months posttreatment completion and beyond, as has been done for group CBT (Heimberg, Salzman, Holt, & Blendell, 1993).

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Received January 5, 2012

Revision received March 21, 2012

Accepted March 26, 2012 ■