The Role of Maladaptive Beliefs in Cognitive Behavioral Therapy: Evidence from Social Anxiety Disorder

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Abstract

Beliefs that are negatively biased, inaccurate, and rigid are thought to play a key role in the mood and anxiety disorders. Our goal in this study was to examine whether a change in maladaptive beliefs mediated the outcome of individual cognitive-behavioral therapy (CBT) for social anxiety disorder (SAD). In a sample of 47 individuals with SAD receiving CBT, we measured maladaptive interpersonal beliefs as well as emotional and behavioral components of social anxiety, both at baseline and after treatment completion. We found that (a) maladaptive interpersonal beliefs were associated with social anxiety at baseline and treatment completion; (b) maladaptive interpersonal beliefs were significantly reduced from baseline to treatment completion; and (c) treatment-related reductions in maladaptive interpersonal beliefs fully accounted for reductions in social anxiety after CBT. These results extend the literature by providing support for cognitive models of mental disorders, broadly, and SAD, specifically.

Keywords

maladaptive beliefs; core beliefs; belief change; social anxiety; cognitive models

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Cognitive models of mood and anxiety disorders posit that maladaptive beliefs that are central to one's identity and are negatively biased, inaccurate, and rigid (e.g., "core beliefs") play a causal role in generating the emotional disturbance that characterizes these disorders

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(Beck & Dozios, 2011). Empirical research has provided evidence that these types of maladaptive beliefs are associated with psychopathology and are generally stable (Riso, du Toit, Stein, & Young, 2007) but sometimes vary with the severity of symptomatology (e.g., Lewinsohn, Steinmetz, Larson, & Franklin, 1981). Many studies have also provided evidence for a potentially *causal* role of maladaptive beliefs in mood and anxiety disorders (e.g., Alloy, Abramson, Whitehouse, Hogan, Panzarella, & Rose, 2006) though this evidence is mixed (Ingram, Miranda, & Segal, 1998; Jarrett, Vittengl, Doyle, & Clark, 2007). Our goal in this study was to examine the role of maladaptive belief change in cognitive-behavioral treatment for social anxiety disorder (SAD).

Contemporary cognitive models of SAD (e.g., Heimberg, Brozovich, & Rapee, 2010; Rapee & Heimberg, 1997) posit that individuals with SAD have maladaptive beliefs regarding themselves (as socially incompetent) and others (as critical judges). When activated in a social situation, these maladaptive cognitions transform innocuous social cues (e.g., another person looking away during a conversation) into significant social threats. Whereas many studies have documented the role of less stable, surface-level maladaptive cognitions, such as appraisals, attributions, and thoughts in SAD (e.g., Schulz, Alpers, & Hofmann, 2008; Stopa & Clark, 1993), only five studies have investigated the role of maladaptive beliefs in SAD (Anderson, Goldin, Kuria, & Gross, 2008; Ball, Otto, Pollack, Uccello, & Rosenbaum, 1995; Pinto-Gouveia, Castilho, Galhardo, & Cunha, 2006; Rapee, Gaston, & Abbott, 2009; Wenzel, 2004).

Changing maladaptive cognitions is a primary focus of the best researched and most widely supported psychotherapeutic treatment for SAD, cognitive-behavioral therapy (CBT; Beck & Dozios, 2011). However, studies investigating maladaptive beliefs in the context of CBT (DeRubeis et al., 1990; Jarrett et al., 2007) have generally been conducted in the context of depressive disorders, except for a study by Hofmann and colleagues (2007) who studied patients with panic disorder, and a study by Rapee and colleagues (2009), who studied patients with SAD. Rapee and colleagues (2009) compared maladaptive beliefs related to negative representations of appearance and performance (e.g., "I look attractive") and "core" beliefs related to SAD (e.g., "I am dumb/stupid") in patients receiving an enhanced cognitive-behavioral treatment, a standard cognitive-behavioral treatment, or stress management. Patients receiving the enhanced treatment demonstrated significantly greater decreases in negative representations than patients in the other two conditions, whereas changes in "core" beliefs did not significantly differ by condition. Furthermore, decreases in negative representations, together with decreases in patients' estimates of cost associated with negative evaluations, partially mediated the link between treatment condition and reductions in diagnostic severity.

In addition to over-endorsement of maladaptive beliefs, several additional studies have investigated whether other types of cognitive biases associated with SAD are associated with SAD change during cognitive or cognitive-behavioral therapy for SAD and whether such changes are associated with or underlie treatment gains (Bruch, Heimberg, & Hope, 1991; Foa, Franklin, Perry, & Herbert, 1996; Hofmann, 2004; McManus, Clark, & Hackmann, 2001). These studies have generally demonstrated that overestimation of the probability of occurrence of negative social events (e.g., "Someone you know won't say hello to you") and the costs associated with occurrence of these events (i.e., how bad it would be if the event happened) mediated the treatment gains for patients with generalized SAD. A final study by Vögele and colleagues (2010) provided evidence of cognitive mediation of symptom reduction among SAD patients, albeit in the context of high density exposure therapy over the course of 4–10 days, rather than CBT or cognitive therapy.

The aim of the present study was to examine the relations between maladaptive beliefs and SAD symptoms by investigating whether belief change accounts for the effects of CBT in the treatment of SAD. Based on several preliminary studies (Anderson et al., 2008; Pinto-Gouveia et al., 2006; Rapee et al., 2009; Wenzel, 2004), we conceptualized *maladaptive beliefs* as unhelpful evaluative cognitions related to the self in the domain of interpersonal interactions (henceforth referred to as "maladaptive interpersonal beliefs"). Using a measure we developed for this purpose, the current research tested three hypotheses: (a) maladaptive interpersonal beliefs are related to social anxiety severity among individuals with SAD; (b) CBT changes these beliefs; and (c) belief change mediates the impact of treatment. To test the third hypothesis, we investigated relations between treatment-related changes in maladaptive interpersonal beliefs and social anxiety among participants receiving immediate and delayed CBT.

Method

Participants

Participants were 47 adults (M_{age} = 32.9, SD_{age} = 9.2; 51.1% female) meeting *DSM-IV* (American Psychiatric Association, 1994) criteria for a principal diagnosis of generalized social anxiety disorder (SAD). Diagnoses were based on the Anxiety Disorders Interview Schedule for the DSM-IV-Lifetime version (ADIS-IV-L; DiNardo, Brown, & Barlow, 1994). A small percentage of participants met criteria for current comorbid conditions, including generalized anxiety disorder (14.9%), dysthymia (4.2%), panic disorder (4.2%), and specific phobia (4.2%). The majority of participants reported their race/ethnicity as Caucasian (57.4%), followed by Asian (23.4%), Hispanic (10.6%), Multiracial (4.3%), African-American (2.1%), and Pacific Islander (2.1%).

Because this study was part of a larger neuroimaging study of the effects of CBT, participants were screened to ensure they (a) did not exhibit any lifetime evidence of psychosis, mania, hypomania, or bipolar disorder; (b) did not use selective serotonin reuptake inhibitors, benzodiazepines, beta-blockers, anti-psychotics, blood thinners, thyroid hormone influencing agents, diabetic medications, or anticonvulsants within three months prior to entering the study; and (c) had not previously received a full-dose (at least 8 sessions) of CBT for any mood or anxiety disorder. Eighty-four potential participants met study inclusion criteria and were invited to participate. Nine participants discontinued *prior* to the randomization phase (e.g., failed to complete all the baseline assessments). A total of 75 patients agreed to complete the study and were randomly assigned to receive immediate CBT or serve as a waitlist control, after which they received CBT (i.e., delayed CBT condition). Of these participants, 47 (immediate treatment condition, *n* = 20; delayed CBT condition, *n* = 27) completed both measures included in this study at baseline and following completion of waitlist and/or treatment, and thus, were included in this study.

The 47 participants included in this study did not differ from those randomized but not included in terms of age, gender, ethnicity, the presence of current or past Axis 1 psychopathology (other than SAD), or past psychotherapy or pharmacotherapy. Furthermore, treatment groups (immediate vs. delayed) did not differ in age, gender, ethnicity, the presence of current or past Axis-I psychopathology (other than SAD), or past psychotherapy, but did differ in past pharmacotherapy, with more participants in the delayed (38.4%) versus immediate (10.0%) group having received past pharmacotherapy (*p* < .05).

Procedure

Participants were recruited through use of electronic bulletin-board listings and referrals from mental health clinics. After passing an initial telephone screening, potential

participants were administered the ADIS-IV-L (DiNardo et al., 1994) by a clinical psychologist (PG or KW), who was trained using video recordings and test cases. Previous research has demonstrated that the ADIS-IV-L demonstrates high reliability for diagnosing SAD (Brown, DiNardo, Lehman, & Campbell, 2001). Individuals with a principal diagnosis of generalized SAD (operationalized as a score of 4 or more on the ADIS-IV-L Clinician's Severity Rating for SAD and ratings for 4 or more for 5 or more distinct social situations; all scales 0–8) were enrolled. All participants were asked to refrain from seeking additional treatment while receiving CBT. The study protocol was approved by the Stanford University Institutional Review Board (IRB), and all participants provided informed consent in accordance with IRB regulations.

Intervention

Individual CBT was administered by Ph.D. level psychotherapists trained according to a manualized protocol (see Hope, Heimberg, Juster, & Turk, 2000; Hope, Heimberg, and Turk, 2006), with on-going, on-site-training and assessment of treatment fidelity provided by the developer of the protocol (RGH). CBT was provided in 16 one-hour weekly sessions in which cognitive restructuring and exposure, both in-session and *in vivo*, were used to reduce theoretically identified causes and symptoms of SAD.

Measures

Liebowitz Social Anxiety Scale – Self-Report (LSAS-SR, Fresco et al., 2001)—
We measured emotional and behavioral aspects of social anxiety with the self-report version (LSAS-SR) of the widely used clinician-administered LSAS (Heimberg et al., 1999; Liebowitz, 1987). The LSAS and LSAS-SR include an identical set of 24 items that assess the degree to which social interactions (e.g., "Talking to people in authority") and performance situation ("Writing while being observed") separately evoke emotions (i.e., fear/anxiety) and behavior (i.e., avoidance) associated with SAD. Participants rate items on a 4-point scale indicating the degree to which they experienced fear/anxiety (0 = None to 3 = Severe) and avoidance (0 = Never [0%] to 3 = Usually [68–100%]) in response to each situation during the past week. We summed across all items to obtain a total score. The LSAS-SR has been shown to be reliable and have good convergent validity (e.g., Baker et al., 2002; Fresco et al., 2001) and demonstrated excellent internal reliability among the total SAD sample at intake and post-treatment (Cronbach's α = .91, .97).

Maladaptive Interpersonal Belief Scale (MIBS)—Our initial step in developing the MIBS was to identify evaluative interpersonal beliefs relevant to SAD. We derived 16 beliefs items by: (1) noting common, relevant beliefs of patients with SAD; (2) consulting with experts and clinicians who treated patients with SAD; and (3) reviewing the literature on SAD. To establish the clinical significance of these items, we asked an expert panel of six clinical psychologists with extensive experience in research and/or treatment of SAD to provide ratings of the extent to which a particular item would be relevant to someone with SAD. All experts regarded six beliefs as "extremely relevant" (rather than "somewhat relevant", or "not at all relevant") in this regard. Because these six items were all keyed in a direction indicating increased endorsement of a given belief, we added five reverse-keyed belief items to create a balanced set of items that would not be subject to acquiescence response bias (e.g., Soto & John, 2009).

We tested whether these beliefs formed an internally consistent set by administering the initial 11 belief items to a sample of healthy adults who did not currently meet *DSM-IV* criteria for any Axis I or II disorders (n = 42; 52% male; M_{age} = 32.9 years, SD = 9.2; 52.4% Caucasian), and college students (n = 198; 39% male; M_{age} = 20.9 years, SD = 2.5; 31% Caucasian). Participants indicated their agreement or disagreement with each belief

item by providing a rating from 1 ("Definitely false" or "Strongly disagree") to 5 ("Definitely true" or "Strongly Agree"). In each sample, we conducted an exploratory factor analysis of the 11 items, to investigate whether items together comprised a single, general factor. In both samples, nine items had substantial and consistent loadings on a single general factor, whereas two ("I must do everything perfectly"; "Others' opinions of me matter a great deal") did not. We excluded these two items from further consideration. The nine remaining items (see Appendix) all had a substantial loading on the first unrotated factor in both samples (with mean factor loadings of .61 for healthy adults and .67 for college students), and there was no evidence for a second factor. Internal reliability was good for the 9-item measure both in the healthy adults sample (α = .77), and in the college student sample (α = .85).

Similar to the healthy adults and college students samples, in our SAD sample we also found that all items had consistent loadings on the general factor (mean factor loading = .66). Internal reliability for the 9-item measure in the SAD sample was good both at baseline and at post-treatment (Cronbach's α = .85, .94). Test-retest reliability over 5-months for the 27 SAD participants who were randomized to the delayed treatment condition was excellent (r =.85).

An analysis of variance (ANOVA) with planned comparisons revealed that, as expected, the mean for SAD participants (M = 3.4, SD = 0.6) was significantly higher than the mean of the healthy adult participants (M = 1.8, SD = 0.4) and college student participants (M = 2.3, SD = 0.6; Omnibus F (2, 286) = 83.8, $p <. 01, \eta_p^2$ = .37, 95% CI [.28, .44]). [1]

Results

We began by investigating associations between maladaptive interpersonal beliefs and social anxiety symptoms among participants completing measures at baseline (n = 47) and post-treatment (n = 35). For participants in the waitlist control/delayed CBT condition, data used in these analyses and analyses reported in the next subsection were obtained from an assessment occurring immediately prior to starting CBT. Using zero-order correlations, we found that maladaptive interpersonal beliefs and social anxiety were associated at baseline (r = .41, p < .01, η^2 = .17) and treatment completion (r = .64, p < .01, η^2 = .41). A Fisher r-to-z transformation revealed that the correlation coefficients at baseline and treatment completion were not significantly different (Z = -1.39, p = .16).

Using repeated measures ANOVA, we found that mean levels of maladaptive interpersonal beliefs significantly decreased from baseline to treatment completion (M = −0.8, SD = 0.7, $Range$ = −3.11 – 0.6; F (1, 34) = 40.1, p < .01, η_p^2 = .54, 95% CI [.30, .69]). In examining change scores, 83% of the participants experienced reductions in maladaptive interpersonal beliefs. Social anxiety symptoms also decreased significantly from baseline to treatment completion (M = −27.6, SD = 26.0, $Range$ = −105.0 – 23.0; F (1, 34) = 39.5, p < .01, η_p^2 = . 54, 95% CI [.29, .68]).

To examine whether the link between treatment and reduction in social anxiety was mediated by reduction in maladaptive interpersonal beliefs, we compared participants receiving immediate (n = 20) and delayed CBT (n = 27) using multiple regression (Baron &

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[1]To assess conceptual/semantic overlap between the MIBS and LSAS, nine independent raters assessed the degree to which each belief item was "conceptually and/or semantically similar" to any LSAS items on an 11 point scale (0 ="not at all similar", 5 = "moderately similar", 10 = "identical"). Raters included three manuscript authors (MB, PG, JG), two experts in CBT for SAD who worked on the study, and four research assistants who are familiar with CBT for SAD. Only a single MIBS item (i.e., "I'm no good at making small talk") had an average score of greater than 5, and the majority of raters stated that this item was most similar to LSAS item 11 (i.e., "Talking with people you don't know very well"). Parallel analyses using a MIBS scale with this item removed demonstrated that no results changed in significance or relative degree of effect.

Kenny, 1986; Preacher & Hayes, 2004). We first investigated whether treatment group (immediate vs. delayed) was associated with: (a) the dependent variable, changes in social anxiety, and (b) the mediator, changes in maladaptive interpersonal beliefs, from pre- to-post treatment for immediate participants and pre- to post-waitlist for delayed participants. Next, we simultaneously entered treatment group and changes in maladaptive interpersonal beliefs in a multiple regression predicting changes in social anxiety. We hypothesized that treatment group would no longer significantly predict changes in social anxiety when accounting for changes in maladaptive interpersonal beliefs, signifying that the link between treatment group and changes in social anxiety was mediated by changes in maladaptive interpersonal beliefs.

As hypothesized, treatment group was significantly associated with change in social anxiety ($\beta = .43$, $p < .01$, 95% CI [.17, .69]). Similarly, treatment group was significantly associated with changes in maladaptive interpersonal beliefs ($\beta = .57$, $p < .01$, 95% CI [.48, 1.20]). In both cases, participants in active treatment experienced greater reductions in scores than participants on the waitlist. In addition, changes in maladaptive interpersonal beliefs were associated with changes in social anxiety ($\beta = .68$, $p < .01$, 95% CI [.33, .66]). Lastly, as hypothesized, simultaneously entering treatment group and changes in maladaptive interpersonal beliefs led to a substantial reduction in the effect of treatment group on changes in social anxiety ($\beta = .05$, $p = .70$, partial correlation coefficient (r) = .04, 95% CI [−.23, .35]). Bootstrapped 95% confidence intervals with 5000 iterations were .16 to .78 (Preacher & Hayes, 2004). The Sobel test (Sobel, 1982) for the indirect effect of treatment group on changes in social anxiety via changes in maladaptive interpersonal beliefs was significant ($Z = 3.4$, $p < .01$). By calculating the proportion of the direct effect accounted for by maladaptive interpersonal beliefs relative to the total effect of treatment group on changes in social anxiety (see Alwin & Hauser, 1975), we found that 87.6% of the effect of treatment on changes in social anxiety was accounted for by the mediation path. These results signify that changes in maladaptive interpersonal beliefs strongly mediated the effect of treatment group on changes in social anxiety with treatment.

To test the specificity of the mediation effect, we conducted parallel analyses to determine whether changes in social anxiety mediated the link between treatment group and changes in maladaptive interpersonal beliefs. We found that changes in social anxiety significantly mediated the link between treatment group and changes in maladaptive interpersonal beliefs ($Z = 2.7$, $p < .01$; bootstrapped 95% confidence intervals with 5000 iterations were .07 to .83), and 39.5% of the effect of treatment on changes in maladaptive interpersonal beliefs was accounted for by changes in social anxiety. Thus, this mediation effect was attenuated compared to the mediation effect reported above.

Discussion

A large body of empirical research has documented the role of maladaptive cognition, appraisals, attributions, and thoughts in SAD (e.g., Schulz et al., 2008; Stopa & Clark, 1993), but few studies have investigated the role of maladaptive beliefs in SAD (Anderson et al., 2008; Pinto-Gouveia et al., 2006; Wenzel, 2004). Our study extends this literature, and specifically, studies investigating cognitive mediation of treatment for SAD (Bruch et al., 1991; Foa et al., 1996; Hofmann, 2004; McManus et al., 2001; Rapee et al., 2009) by demonstrating that maladaptive beliefs related to evaluation in the context of interpersonal interactions were (a) moderately correlated with social anxiety symptom severity (hence, beliefs measured by the MIBS and social anxiety symptoms measured by the LSAS are distinct but related constructs), and (b) significantly reduced from baseline to treatment completion. Furthermore, treatment-related reductions in maladaptive interpersonal beliefs significantly and substantially mediated the effect of CBT on social anxiety symptom

severity (and vice-versa, albeit to a much lesser extent). We posit that differences with Rapee and colleagues (2009), who found that beliefs related to negative evaluations *partially* mediated the link between treatment condition and reductions in diagnostic severity, were likely due to differences in our comparison groups. We compared CBT to waitlist control, whereas Rapee and colleagues (2009) compared three active treatments, at least two of which contributed to a degree of belief change.

Our findings are consistent with the proposition that maladaptive interpersonal beliefs play a causal role in SAD and that CBT therapy can change these beliefs. However, we were not able to provide a direct causal test because we did not include sufficient numbers of repeated assessments to demonstrate temporal precedence (Kazdin, 2007). By including our measure of maladaptive interpersonal beliefs, future research on CBT for SAD can investigate whether these conditions are met and ultimately whether changes in maladaptive interpersonal beliefs meet these additional criteria as a mechanism of change. Such research is clearly needed as there is a relative lack of understanding of how and why evidence-based treatments work and because studies investigating the cognitive mediation of the effects of CBT for mood and anxiety disorders have yielded mixed results (Kazdin, 2007; Kraemer, Wilson, Fairburn, Agras, 2002). Our results provide evidence that belief change is critical to CBT, at least for the treatment of SAD.

Several limitations of the present study bear mention. First, our assessment of the emotional and behavioral components of social anxiety was limited to the LSAS-SR. Although the LSAS is the most widely used clinical measure of social anxiety and has demonstrated excellent psychometric properties and evidence of convergent and discriminant validity (Baker et al., 2002; Fresco et al., 2001; Heimberg et al., 1999), future research would benefit from using additional methods, such as diagnostic interviews by an independent assessor. Second, the generalizability of our results is limited, as all participants were treatment-seeking individuals who met criteria for generalized SAD and passed neuroimaging safety screening criteria as well. It will be important for future research to investigate relations between maladaptive interpersonal beliefs and social anxiety in populations with a broad range of social anxiety, including those without SAD. Third, we were unable to test the hypothesis that mediation of the impact of treatment on social anxiety by maladaptive interpersonal beliefs varies by treatment type. Future treatment-outcome research can best address this limitation by investigating these relations in different types of treatment, especially by comparing CBT to therapies that are hypothesized to work by targeting factors other than cognition (e.g., Mindfulness-Based Stress Reduction; Kabat-Zinn,1990).

Acknowledgments

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Appendix Maladaptive Interpersonal Beliefs Scale

Instructions

Please indicate your agreement or disagreement with each of the following statements. Although some of these statements may seem similar to one another, they differ in important ways. There are no "right" or "wrong" answers, and you need not be an "expert" to complete this questionnaire. The purpose of this questionnaire will be best served if you describe yourself and state your opinions as accurately as possible.

For each statement select the response that best represents your opinion, making sure that your answer is in the correctly numbered space.

Mark "SD" if the statement is definitely false or you strongly disagree.

Mark "D" if the statement is mostly false or you disagree.

Mark "N" if the statement is equally true or false, you cannot decide, or if you are neutral.

Mark "A" if the statement is mostly true or you agree.

Mark "SA" if the statement is definitely true or you strongly agree.

	SD	D	N	A	SA
1. I'm no good at making small talk.					
2. People like me. (reverse scored)					
3. I don't fit in.					
4. I am worthwhile. (reverse scored)					
5. If people knew how nervous I get, they would think I was weird.					
6. I am lovable. (reverse scored)					
7. If people could see who I really am, they would reject me.					
8. I am a good conversationalist. (reverse scored)					
9. I fit in. (reverse scored)					

1. Investigated maladaptive interpersonal beliefs change in treatment for social anxiety disorder (SAD)

2. 47 individuals with SAD received individual cognitive behavioral therapy for SAD

3. Beliefs associated with social anxiety at baseline and treatment completion

4. Beliefs significantly reduced from baseline to treatment completion

5. Reductions in beliefs fully accounted for reductions in social anxiety