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Expectancy/Credibility Change as a Mediator of Cognitive Behavioral Therapy for Generalized Anxiety Disorder: Mechanism of Action or Proxy for Symptom Change?

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Abstract

Examined the mediating effect of changes in expectancy/credibility from sessions 4–7 of 14-session cognitive and behavioral therapy for generalized anxiety disorder (GAD). In 76 adults with primary GAD, we predicted that expectancy/credibility would change significantly from sessions 4–7, that degree of change in expectancy/credibility would predict degree of reliable change at posttreatment, and that changes in expectancy/credibility would mediate the relationship between pretreatment severity and change at posttreatment. In support of the hypotheses, a latent growth model revealed significant increases in expectancy/credibility over the critical period. In addition, baseline GAD severity, expectancy/credibility intercept, and rate of change in expectancy/credibility all positively predicted degree of reliable change at posttreatment. Rate of change in expectancy/credibility during the critical period partially mediated the effect of baseline GAD severity, accounting for 38% of the variance in this relationship. This effect was not accounted for by preceding or concurrently changing anxiety levels.

Generalized anxiety disorder (GAD) is a common and disabling mental health problem with a lifetime prevalence as high as 7% (Kessler & Wittchen, 2002). Those with GAD are among the heaviest users of primary care, specialty clinic, and emergency room services, contributing considerably to the medical cost associated with anxiety disorders in the U.S. (Fogarty, Sharma, Chetty, & Culpepper, 2008; Jones, Ames, Jeffries, Scarinci, & Brantley, 2001; Mehl-Madrona, 2008; Ormel et al., 1994; Schonfeld et al., 1997; Wittchen, 2002). GAD is also a risk factor for coronary heart disease independent of depression (Barger & Sydeman, 2005; Härter, Conway, & Merikangas, 2003; Lavie & Milani, 2004; Todaro, Shen, Raffa, Tilkemeier, & Niaura, 2007). Thus, untreated GAD is very expensive in terms of distress, disability; lost-work productivity; quality of life, and medical problems (Newman, 2000). Given the costly nature of untreated GAD, research focused on GAD treatment is highly important.

Cognitive-behavioral therapy (CBT) is currently the only empirically-supported psychotherapy for GAD (Chambless & Ollendick, 2001). In a meta-analysis of extant controlled outcome studies, CBT for GAD produced significant improvement, which was maintained for up to two years following treatment termination (Borkovec & Ruscio, 2001). Successful CBT for GAD also leads to a reduction in comorbid disorders (Borkovec, Abel, & Newman, 1995; Newman, Przeworski, Fisher, & Borkovec, 2010). Nonetheless, CBT does not work for everybody and it leads to the lowest percentage of clinically significant change in GAD when compared to other anxiety disorders (Brown, Barlow, & Liebowitz,

1994). Such a lower success rate highlights the importance of understanding theoretically important change mechanisms associated with CBT. However, no studies to date have examined mechanisms of change with respect to CBT for GAD. Thus, although we know that CBT works for some people with GAD and not others, we do not know how or why it changes GAD symptoms.

Two factors that have been viewed as important in the examination of change mechanisms for psychotherapy are therapeutic expectancy and credibility (Borkovec & Nau, 1972; Goldstein, 1960). Therapeutic expectancy refers to clients' predictions concerning the likelihood that a particular treatment will help reduce the relevant target problem. Treatment credibility refers to the extent to which a treatment makes sense and is logical to clients. It has been theorized that people's beliefs and expectations with respect to psychotherapy play a crucial role in shaping their experiences of that therapy. In fact, expectancy and credibility are viewed as important mechanisms of treatment common to all psychotherapy approaches (Greenberg, Constantino, & Bruce, 2006). Within a directive approach such as CBT, there are many opportunities to influence the degree of expectancy and credibility that are generated. For example, these factors may be influenced via the use of an initial therapeutic rationale. Theoretically, the goal of such a rationale is to address any unreasonable treatment or outcome expectations (e.g., my anxiety will be eliminated), inform clients what treatment will be like, describe the mechanisms of action underlying the treatment, instill confidence that treatment will be beneficial, and align agreement between the client and the therapist on the goals and tasks of therapy. In fact, studies find that expectancy and credibility can be influenced significantly by manipulating systematically such initial rationale features as the duration, quantity of information supplied, and the specific language employed (Horvath, 1990; Kazdin & Krouse, 1983). Further, both expectancy (Ahmed & Westra, 2009) and credibility (Hardy et al., 1995) have been demonstrated empirically to change after the delivery of an initial CBT rationale.

Although there are data that the initial rationale influences expectancy and credibility; it is unclear whether expectancy or credibility remain static for the remainder of treatment or whether they exhibit further change. It is possible, for example, that clients quickly decide, based on an initial rationale, that treatment will or will not be successful. This viewpoint is supported by studies examining first session expectancy and credibility ratings as predictors of treatment outcome. Expectancy in response to the initial treatment rationale delivered during the first session has been found to be positively associated with outcome from CBT for GAD (Borkovec & Costello, 1993; Borkovec & Mathews, 1988) as well as with reduced likelihood to relapse (Durham, Allan, & Hackett, 1997). Similarly, initial credibility has been associated with simulated change for simple phobia (Nau, Caputo, & Borkovec, 1974) and actual treatment outcome for GAD (Barlow, Rapee, & Brown, 1992). However, whether further change in expectancy/credibility will occur over sessions and whether such changes will relate to outcome has not been empirically investigated. Even though the current study assesses neither the specific process factors influencing expectancy and credibility, nor the factors which expectancy influences that might lead to more positive outcome, in the next two paragraphs we elaborate on such potential factors to provide the basis for our prediction that expectancy/credibility will change during treatment and that such change will mediate outcome.

It appears reasonable to assume that expectancy and credibility are continually influenced throughout the course of therapy. For example expectancy/credibility might be influenced by additional rationales delivered after the first session of therapy, as each therapeutic technique is introduced. Also, pieces of the initial rationale are often repeated during the course of therapy to help the client integrate and remember all of the information contained in it. Thus, therapeutic rationales may continue to influence and change expectancy and

credibility beyond the first session, particularly during the first half of treatment when clients are continually being introduced to different CBT techniques. Therapeutic expectancy and credibility may also change during treatment as a result of clients' engagement with cognitive and behavioral techniques. For example, self-efficacy theory would predict that enactive psychological treatments such as CBT would boost efficacy perceptions (Bandura, 1977; Rosenthal & Bandura, 1978; Williams, 1990). Similarly, Kazdin and Wilcoxon (1976) have suggested that actual experience with therapeutic procedures may be more powerful in influencing views toward treatment than simply hearing a credible therapeutic rationale. Moreover, cognitive dissonance theory (Festinger, 1957) would predict that after clients have attended several therapy sessions and have begun to invest in practicing various techniques, they would positively align their beliefs in these techniques and in the therapy itself to match their investment in order to justify their efforts. Given all of these factors, it is possible that during treatment, views toward this treatment may continue to change.

In addition to the possibility that expectancy and credibility change during treatment and well after the initial therapy rationale has been delivered, changes in treatment expectations may be a mechanism by which CBT for GAD influences change in GAD symptoms. A number of theorists have stressed the importance of treatment expectancy and credibility as potential mechanisms of change (Bootzin & Lick, 1979; Borkovec, 1972; Ilardi & Craighead, 1994; Kazdin, 2005; Wilkins, 1979). Positive views toward treatment may motivate continued investment in attending sessions and making use of therapeutic techniques. Further, schema theory (Beck, 1976) would predict that a positive psychotherapy schema would lead clients to be more likely to attend to and process information that confirms their perceptions than to information that does not confirm their perceptions. Alternatively, however, change in expectancy/credibility could merely be a proxy for changes in symptomatology. In this case, any effect of treatment expectations or credibility on GAD symptoms at outcome may be simply due to symptom changes that occurred during the treatment period (Bootzin & Lick, 1979).

The current study, a secondary analysis of a previously published outcome study (Borkovec, Newman, Pincus, & Lytle, 2002) had three goals. First, we sought to determine whether a composite variable that included items reflecting both expectancy and credibility continued to change during treatment. Given that some studies have found that there may be critical periods in psychotherapy (e.g., Present et al., 2008; Tang & DeRubeis, 1999), we chose to examine a critical period in therapy from the fourth session of treatment to the seventh session. By the fourth session, the initial treatment rationale and psychoeducational components of the treatment have been administered, and the treatment has begun in earnest. Because the current treatment was administered over a 14-week period, the seventh session marks the midpoint of the treatment period. Therefore, the critical time period is constrained within the first half of treatment and at the same time takes place after the initial informational elements of treatment have been presented. Secondly, we were interested in determining whether change in expectancy/credibility during the critical period mediated change in symptom improvement. If expectancy/credibility change during treatment mediates the relationship between pre and posttreatment GAD severity, this would implicate changes in expectancy/credibility as one of the mechanisms by which symptom reduction occurs during CBT for GAD.

Kraemer, Wilson, Fairburn, and Agras (2002) note that researchers should seek to avoid proposing as mediators those variables that merely reflect treatment outcome. Therefore, an additional goal of the present study was to examine the covariation of changes in expectancy/credibility with changes in anxiety symptoms over the critical period. If changes in expectancy/credibility significantly and substantially covary with changes in symptom

severity, this might suggest that expectancy/credibility changes are epiphenomenal to changes in syndrome severity. However, if these phenomena are orthogonal, it may substantiate the notion that changes in expectancy/credibility during treatment mediate the effect of treatment on symptom reduction. Secondary to this, we examined whether symptom reduction during the first three sessions of treatment predicted change in expectancy/credibility during sessions 4–7. If reduction in the initial three sessions—the treatment period preceding the identified critical period—does not predict change in expectancy/credibility during the critical period, such a result would further substantiate expectancy/credibility as a mechanism of change independent of the symptom reduction that occurs during treatment. In the present study, expectancy/credibility was collected at the end of every therapy session, and severity data were collected daily over the course of the study; allowing for the modeling of within-treatment processes as mediators of treatment outcome.

We predicted that treatment expectancy/credibility would change during sessions 4–7 of 14-session CBT for GAD, that greater baseline symptom severity would predict greater changes in expectancy/credibility during sessions 4–7, and that the rate of change in expectancy/credibility over the critical period would mediate the change in GAD severity from pre to posttreatment. Change in expectancy/credibility was therefore hypothesized to be a mechanism by which treatment exerts its effect on symptom reduction. It is important to note that rate of change refers to the slope of change over this period and not the absolute change. Whereas the latter can be seen as an outcome itself, the former is a process and better represents the mechanistic function of expectancy/credibility presently hypothesized. Given the requirements of mediation, as well as previous findings showing that more severe symptomatology predicts more change in response to CBT for GAD (e.g., Newman et al., 2010; Wetherell et al., 2005) we hypothesized that pretreatment GAD severity significantly and directly would predict posttreatment outcome, that change in expectancy/credibility significantly and directly would predict posttreatment outcome, and that the direct relationship between pre and posttreatment GAD severity would be reduced or negated when allowing a mediational indirect effect of pretreatment on posttreatment via change in expectancy. We also predicted that change in expectancy/credibility would not covary with within-treatment changes in symptom severity, nor would they be predicted by symptom reductions over the initial three sessions of treatment.

METHOD

Participants

In total, 459 people responded to advertisements in local newspapers or referrals from mental health practitioners. Of these, 320 were ruled out by phone screens for not meeting study inclusion criteria, 54 clients were ruled out via an initial structured interview, and 9 clients were ruled out during a second structured interview, leaving 76 participants with primary generalized anxiety disorder who entered treatment. Average age was 36.62 years ($SD = 11.56$), and average duration of GAD diagnosis was 12.28 years ($SD = 11.87$). Clients were mostly Caucasian (89.5%) and women (68.4%). The study included 2 African American (2.6%), 3 Hispanic (3.9%), and 3 Middle Eastern clients (3.9%). Only 2 clients were taking psychotropic medications for anxiety; they agreed to maintain dosage and frequency during therapy with their physician's approval. All of these characteristics were nearly equally distributed among treatment conditions and were not significantly different across conditions. All participants consented to the study, and IRB approval was attained.

Procedure

Selection and Assessor Outcome Ratings—Admission criteria included consensus between the two diagnostic interviewers on: a principal diagnosis of GAD based on the

Diagnostic and Statistical Manual of Mental Disorders (3rd ed., rev.; DSM-III-R; American Psychiatric Association, 1987), no diagnosable panic disorder (as recommended by the funding agency's review committee), a Clinician's Severity Rating (CSR) for GAD of 4 (moderate) or more, absence of concurrent psychosocial therapy, no history of having received CBT methods in prior therapy, no medical contributions to the anxiety, no antidepressant medication, and absence of severe MDD, substance abuse, psychosis, and organic brain syndrome. All but two clients (97.1%) concurrently met both DSM-III-R and DSM-IV criteria for GAD.

Clinical assessors (advanced clinical graduate students trained to reliability in diagnostic interviewing) administered 30-minute phone screens as well as the Anxiety Disorders Interview Schedule-III-R (ADIS-R; Di Nardo & Barlow, 1988) to determine diagnostic suitability. During the phone screen, 327 people were ruled out, most of whom did not meet criteria for a diagnosis of GAD (most commonly for not experiencing excessive worry or at least three worry topics). Those not ruled out by phone screen were administered a modified version of the ADIS-R (Di Nardo & Barlow, 1988), which included the Hamilton Anxiety Rating Scale (HARS; Hamilton, 1959), Hamilton Rating Scale for Depression (HRSD; Hamilton, 1960), CSRs for GAD and comorbid disorders, and additional questions in the section for GAD corresponding to two criteria being proposed at the time of study initiation by the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; DSM-IV; American Psychiatric Association, 1994) subcommittee for GAD (i.e., uncontrollable worrying, and three of six associated symptoms). A second ADIS-R was administered within two weeks by the therapist who would see the client in therapy to reduce the likelihood of false positive cases. At first ADIS-R, 54 people were ruled out, and 9 additional people were ruled out at the second ADIS-R, leaving 76 people who were randomly assigned to treatment

Pretreatment diagnoses, both primary and comorbid, were based on consensus between the independent structured interviewers. A random subsample of 20% of pretreatment audiotapes of the ADIS-R interviews conducted by the primary assessor (prior to developing consensus) was reviewed for reliability purposes. There was good to excellent agreement on the presence of comorbid diagnoses with kappa coefficients ranging from .68–1 and very good agreement on CSRs of comorbid disorders with intraclass correlations ranging from .77–1. For the presence of GAD, kappa agreement was 1, and Finn's r (Whitehurst, 1984) which corrects for a restricted range of CSRs for GAD was .74. Outcome measures were administered at pre and posttreatment. The client daily diary was completed 4x/day during the treatment period and measures of expectancy and credibility were administered at the end of each psychotherapy session.

Outcome Measures

Clinician's Severity Rating—For each diagnosis, interviewers assigned a 0–8 rating indicating their judgment of the degree of distress and interference in functioning associated with the disorder (0 = none to 8 = very severely disturbing/disabling). Clients who met criteria for any diagnosis were assigned a CSR of 4 (definitely disturbing/disabling) or higher (clinical diagnoses). When key features of a disorder were present but were not judged to be extensive or severe enough to warrant a formal diagnosis (or for disorders in partial remission), a CSR of 1–3 was assigned. When no features of a disorder were present, clinical severity ratings of 0 were given. Brown and colleagues (Brown, Di Nardo, Lehman, & Campbell, 2001) demonstrated good to excellent interrater reliability for CSRs for anxiety and mood disorders except dysthymia ($r = .36$) with correlations ranging from .65 to .84. Diagnostic reliability of CSRs in the current study ranged from an intraclass correlation of .77 to 1, and Finn's r for GAD was .74.

State Trait Anxiety Inventory–Trait version—(STAI-T; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983). This 20-item scale is used to measure trait anxiety. Internal consistency reliability is high (in the .80s and .90s), and retest reliability is much higher for the trait form (high .70s) than the state form (from .27 to .54). Convergent and discriminant validity has also been demonstrated for this questionnaire (Spielberger et al., 1983).

Hamilton Anxiety Rating Scale—(HARS; Hamilton, 1959). This 14-item clinician-administered scale provides a rating of severity of each overarching anxiety symptom cluster on a scale from 0 (not present) to 4 (very severe/incapacitating). Internal consistency ranged from adequate to good ($\alpha = .77$ to $.81$; Moras, Di Nardo, & Barlow, 1992) to excellent ($\alpha = .92$) (Kobak, Reynolds, & Greist, 1993). Retest reliability was ICC = .86 across 2 days and inter-rater reliability ranged from an ICC of .74–.96 (Bruss, Gruenberg, Goldstein, & Barber, 1994). A version with less overlap between anxiety and depressive symptomatology (Riskind, Beck, Brown, & Steer, 1987) was used in conjunction with the ADIS-R.

Penn State Worry Questionnaire—(PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990). The PSWQ is a 16 item self-report measure of the frequency and intensity of worry. Factor analysis indicated that the PSWQ assesses a unidimensional construct with internal consistency of .91 (Meyer et al., 1990). High retest reliability (ranging from .74–.93) was also demonstrated across periods ranging from 2–10 weeks (Molina & Borkovec, 1994). Correlations between the PSWQ and measures of anxiety, depression, and emotional control supported the convergent and discriminant validity of the measure (Brown, Antony, & Barlow, 1992).

Process Measures

Client Daily Diary—(CDD). Patients recorded anxiety levels 4 times a day (upon arising, end of morning, end of afternoon, and end of evening), rating their overall level of anxiety during the preceding period of the day on a 0–100 scale. Weekly averages were computed based on the 28 time points within each week. Two-week retest reliability was .80 based on baseline data from the current trial. In addition, convergent and discriminant validity was demonstrated by significantly stronger correlations with the Hamilton Anxiety Scale and with the Response to Relaxation and Arousal Questionnaire than with the Hamilton depression scale using pretherapy data from the current study. The current study also had an average diary compliance rate of 95%.

Credibility and Expectancy Questionnaire—(CEQ; Borkovec & Nau, 1972; Devilly & Borkovec, 2000). This 6-item self-report instrument measures treatment credibility and client expectancy for improvement. The CEQ demonstrates high internal consistency, ($\alpha = 0.79$ – 0.90). Retest reliability is $r = 0.82$ for the expectancy factor and $r = 0.75$ for the credibility factor (Devilly & Borkovec, 2000). The first four items of this scale are rated based on cognitive appraisal whereas the last two items are rated based on feelings about the therapy. Thus, to form a factor that reflected participants cognitions about the therapy, we used only the first four CEQ items (At this point, how logical does the therapy offered to you seem?, At this point, how successfully do you think this treatment will be in reducing your anxiety symptoms?, How confident would you be in recommending this treatment to a friend who experiences similar problems?, By the end of the therapy period, how much improvement in your anxiety symptoms do you think will occur?). These items were standardized (due to the fact that the items are not all rated on the same scale) and then averaged to form the expectancy/credibility factor. This scale was administered at the end of each therapy session throughout the entire treatment. To reduce demand characteristics,

client forms were sealed in an envelope upon completion, and clients were told that the therapist would never see the completed forms.

Therapy Conditions

Fourteen weekly sessions were administered, with one fading/termination session after postassessment. Participants were randomly assigned to receive either self-control desensitization with applied relaxation (SCD; $N = 25$), cognitive therapy (CT; $N = 24$), or combined cognitive behavioral therapy (CBT; $N = 26$). Therapists followed therapy manuals for each therapy condition. In all conditions, the first four sessions were 2 hours in duration; remaining sessions were 1.5 hours. The first 30 minutes of each SCD and CT session involved only supportive listening. The methodological purpose of this portion in CT and SCD was to hold constant the total amount of treatment time while also holding constant the total amount of time devoted to CT in both the CT and CBT conditions and the total amount of time devoted to SCD techniques in both the SCD and CBT conditions. Therapists delivering CBT used the Borkovec and Costello (1993) manual. The SCD and CT manuals were adapted for this study based on the relevant components of the Borkovec and Costello (1993) CBT and nondirective (supportive listening) therapy manuals.

Several aspects were common to the three conditions, although their content differed according to assignment: presentation of a model of anxiety and rationale for therapy, self-monitoring and early identification of anxiety cues, homework assignments, and review of homework including the results of daily self-monitoring and technique practice and applications. CT entailed cognitive therapy (i.e., logical analysis, examination of evidence and probabilities, labeling of logical errors, decatastrophizing, generation of alternative thoughts and beliefs) plus supportive listening. In addition to including supportive listening, SCD entailed progressive relaxation training, cue-controlled, and differential relaxation training as described in Bernstein and Borkovec (1973), slowed diaphragmatic breathing, relaxing imagery, meditational relaxation, applied relaxation training, and SCD as described by Goldfried (1971). CBT contained all of the treatment techniques in CT and SCD, except that no supportive listening element was included.

Statistical Analyses

To reduce the probability of Type I error, we created a single continuous baseline variable to represent GAD severity. Raw scores for the PSWQ, HARS, CSRs for GAD, and STAI-T were converted into standardized z-scores and averaged for each participant. We also created a GAD-change measure by calculating the average reliable change index (RCI; Jacobson & Truax, 1991) across the four GAD outcome measures. RCI reflects the degree of change that occurred beyond the fluctuations of an imprecise measuring instrument, and values greater than 1.96 represent statistically significant change (McGlinchey, Atkins, & Jacobson, 2002). RCI is a commonly used measure of treatment gains and is favored over the use of categorical classification systems because of its greater statistical power as a continuous variable (Steketee & Chambless, 1992). The following values were used in the RCI formulae in the present study: GAD CSR: $SD = 0.91$, reliability = .72; STAI-T: $SD = 7.66$, reliability = .84; PSWQ: $SD = 8.09$, reliability = .91; HARS: $SD = 6.9$, reliability = .80. The standard deviations represent the standard deviation of the pooled sample at pretherapy assessment, and the reliability estimates represent reported reliability coefficients for each measure (Bruss et al., 1994; Meyer et al., 1990; Newman et al., 2010; Spielberger et al., 1983). Mean RCIs were calculated for change immediately after treatment relative to pretherapy assessment.

There were no differences between the therapy conditions on any pretherapy assessment. Treatment expectancy/credibility also did not vary by condition. Also, there were no

significant differences between conditions in treatment efficacy; and all 3 treatments led to significant improvements at posttreatment that were maintained over a 2-year follow-up period. Therefore, analyses were conducted by collapsing across treatment conditions. As noted earlier, we selected sessions 4–7 to examine change in expectancy/credibility because these sessions occurred after the first session (when expectancy/credibility is typically assessed) but before the mid-point of treatment.

A given variable or process serves as a mediator when: 1. the independent variable, X, has a direct and significant effect on the dependent variable, Y; 2. the mediator, M, has a direct and significant effect on Y when controlling for X; and 3. the direct effect of X on Y is reduced or negated when allowing an indirect effect of X on Y via M, that is, when M mediates the relationship between X and Y (Baron & Kenny, 1986; Cole & Maxwell, 2003; Kenny, Kashy, & Bolger, 1998). A negation of the direct effect of X on Y is a full mediation, whereas a significant reduction is a partial mediation. However, Cole and Maxwell (2003) note that additional concern must be given to the temporal nature of the data. Mediators are assumed to be mechanisms by which X exerts its effect on Y. Therefore, X must cause M, and M, in turn, must cause Y. In order to satisfy these causal requirements, X must precede M, and M must precede Y in time (Cole & Maxwell, 2003; Holland, 1986).

The mediating effect of change in expectancy/credibility on treatment outcome was tested via a latent-growth mediation model in LISREL (version 8.80; Jöreskog & Sörbom, 2006). All analyses were carried out on raw data with 1.45% percent missingness, using maximum likelihood (ML) estimation. ML is a method of statistical estimation that calculates the most likely parameter values for a set of observed data. It is robust to the presence of missing data, as it uses only available data and ignores missing cases. In addition, LISREL uses an expectation-maximization (EM) algorithm to optimize calculations of parameter estimates in the presence of missing data. The latent-growth mediation analysis was carried out in a three-step process. A path was first established between baseline GAD severity—as represented by the composite variable—and reliable change at posttreatment. Then, paths were tested between the intercept and slope for the expectancy/credibility growth model and reliable change at posttreatment. Finally, the mediation model was tested by allowing all previous paths between the predictors and outcome, as well as an additional path from baseline GAD severity to slope for change in expectancy.

RESULTS

Preliminary Analysis: Goodness of Fit for the First Four CEQ Items as a Factor for Expectancy/Credibility

The first four items of the CEQ from the first-session assessment were allowed to load on a single factor in a confirmatory factor analysis. This model revealed strong loadings for all four items ($\lambda = .69, .89, .83, \text{ and } .57$, respectively) and an excellent fit to the data, $\chi^2 (2) = 2.70, p = .26, RMSEA = .07$. Retest reliability of the four-item expectancy/credibility factor from the first to second session was correspondingly strong and significant, $r = .83, p < .001$. Thus, the use of the first four items of the CEQ as a unified factor for expectancy/credibility was supported, and this factor was used for the remaining analyses.

Latent Growth Mediation Model for Expectancy Change

Step 1: Reliable Change on Baseline Severity—A path model was first created wherein RCI at posttreatment was regressed on baseline GAD severity. The λ matrix was set to identity, and the θ matrix fixed to zero, yielding a saturated model. Therefore, the model fit was not interpretable. However, the regression of RCI on baseline severity was significant, $B = .40, \beta = .47, SE = .09, t = 4.36, d = .74$. Inspection of the means model

revealed a significant mean value for RCI, $\alpha = 4.55$, $SE = .26$, $t = 17.33$, $d = 2.95$. Baseline GAD severity, a standardized variable, was not found to significantly differ from zero, $\alpha = 0.0$, $SE = .35$, $t = 0$, $d = 0$.

Step 2: Reliable Change on Expectancy/Credibility Growth Model—Next, a latent growth model (LGM) was constructed for the change in expectancy/credibility during the critical period. Figure 1 shows a graph of the change in expectancy/credibility during this period. The λ matrix was fixed such that all paths from $\eta_{\text{intercept}}$ to observed expectancy/credibility scores at sessions 4–7 were given a value of one, and paths from η_{slope} to expectancy/credibility scores at sessions 5–7 were given values of 1, 2, and 3, respectively. RCI was then regressed upon both the intercept and slope for the expectancy/credibility growth model, and a correlation was allowed between the error of the latent growth factors. This model provided an excellent fit to the data, $\chi^2(7) = 3.07$, $p = .88$, $RMSEA < .001$. Reliable change at posttreatment was significantly predicted by both the intercept, $B = .22$, $\beta = .39$, $SE = .06$, $t = 3.43$, $d = .58$, and slope, $B = 1.36$, $\beta = .46$, $SE = .47$, $t = 2.88$, $d = .49$, for change in expectancy/credibility during the critical period. Inspection of the means model revealed significant mean values for RCI, $= -2.57$, $SE = .26$, $t = -9.74$, $d = 1.66$, intercept, $= 29.96$, $SE = .55$, $t = 54.60$, $d = 9.28$, and slope, $= .42$, $SE = .12$, $t = 3.36$, $d = .57$.

Step 3: Latent-Growth Mediation Model—Finally, a mediation model was constructed such that, in addition to the paths reported for steps 1 and 2, a path from baseline GAD severity to the latent slope for rate of change in expectancy/credibility was allowed. This model provided an excellent fit to the data, $\chi^2(10) = 9.89$, $p = .45$, $RMSEA < .001$. All regression relationships remained significant, including the regression of RCI on baseline GAD severity, $B = .25$, $\beta = .29$, $SE = .10$, $t = 2.46$, $d = .42$. However, this relationship was partially mediated by the rate of change in expectancy/credibility: the standardized β was reduced from .47 in the initial model to .29 in the mediation model, indicating that the rate of change in expectancy/credibility accounted for 38% of the variance in this relationship. Baseline GAD severity significantly predicted the rate of change in expectancy/credibility over the critical period, $B = .12$, $\beta = .38$, $SE = .04$, $t = 2.96$, $d = .50$, and RCI remained significantly predicted by both the latent intercept, $B = .16$, $\beta = .30$, $SE = .06$, $t = 2.65$, $d = .45$, and slope factors, $B = 1.01$, $\beta = .37$, $SE = .45$, $t = 2.26$, $d = .38$, for the expectancy/credibility growth model. Inspection of the means model revealed significant mean values for RCI, $= -.78$, $SE = .25$, $t = -3.16$, $d = .54$, intercept, $= 29.95$, $SE = .55$, $t = 54.60$, $d = 9.28$, and slope, $= .41$, $SE = .12$, $t = 3.42$, $d = .58$. Figure 2 depicts the path models for steps 1, 2, and 3.

Covariation of Change in Expectancy/Credibility and Change in Severity—In order to test whether the effect of expectancy/credibility change on RCI was confounded or predicted by changes in GAD symptom severity, a model was constructed with parallel quasi-simplex autoregressive models (Mandys, Dolan, & Molenaar, 1994) for expectancy/credibility and CDD during the initial seven weeks of CBT for GAD. Expectancy/credibility and diary for week 2 were regressed on week 1, week 3 on week 2, week 4 on week 3, and so forth for each variable, respectively. Then correlations were allowed between the two indices at each week. Finally, modification indices were inspected to examine whether any lagged or cross-lagged relationships existed. Results indicated that there were no cross-lagged relationships, and all correlations were non-significant. Thus, changes in expectancy/credibility and symptom severity over the critical period, as well as during the three preceding weeks, were orthogonal. Figure 3 depicts the relationships between expectancy/credibility and CDD severity during the initial seven weeks of treatment.

DISCUSSION

In the present study we examined the mediating effect of changes in expectancy/credibility during CBT for GAD on reliable change in GAD severity. We were further interested in resolving the paradox by which expectancy/credibility following the initial psychotherapy rationale is thought to be a fixed predictor of treatment outcome but also a process variable, malleable through psychotherapeutic intervention. We believed that expectancy/credibility would significantly change during a, critical period from the fourth to seventh sessions of a 14-week treatment and that the degree of change in expectancy/credibility that occurred during treatment would be instrumental in predicting the degree of reliable change at posttreatment, and, finally, that such changes in expectancy/credibility would mediate the relationship between pretreatment severity and change at posttreatment. We also predicted that change in expectancy/credibility would be orthogonal to preceding or co-occurring change in GAD symptoms.

A mediation model was tested by constructing a latent growth model for change in expectancy/credibility between sessions 4 through 7 of a 14-week cognitive-behavioral treatment and allowing the slope for the rate of change in expectancy/credibility to mediate the relationship between baseline GAD severity and reliable change at posttreatment. In support of our initial hypothesis, the mean structure of the latent growth model revealed significant fixed effects for intercept and slope, the latter indicating significant increases in expectancy/credibility over the critical period. Structural results indicated that baseline GAD severity, expectancy/credibility intercept, and rate of change in expectancy/credibility all significantly and positively predicted the degree of reliable change at posttreatment. The rate of change in expectancy/credibility during the critical period partially mediated the effect of baseline GAD severity, accounting for 38% of the variance in this relationship. This effect was not accounted for by preceding or concurrently changing anxiety levels assessed using a daily diary. Thus, changes in expectancy/credibility and symptom severity over the first seven weeks of CBT for GAD were orthogonal.

These results suggest that change in expectancy/credibility, a cognitive variable, may be one of the mechanisms by which CBT leads to symptom change in GAD. The role of expectancy/credibility change as a mechanism of therapeutic change is substantiated both by the independent effect of the latent growth model for expectancy/credibility on RCI as well as in the mediating effect of expectancy/credibility slope on the relationship between pre and posttreatment GAD severity. In the case of the former, expectancy/credibility during the critical period accounted for 36% of the variance in RCI at posttreatment; and in the latter, change in expectancy/credibility during the critical period accounted for 38% of the variance in the relationship between pre and posttreatment GAD severity. Thus, as either a main or mediating effect, expectancy/credibility change during the critical period accounted for nearly 40% of the variance in therapeutic change at posttreatment. This strongly implicates expectancy/credibility change during CBT for GAD as a mechanism of therapeutic change.

Another facet of the present study implicating the mechanistic function of expectancy/credibility change on therapeutic change is the observed means for RCI controlling for, and independent of, the effect of expectancy/credibility change. The mean RCI for the sample was 4.55, well above the 1.96 minimum required for clinically significant change. However, when controlling for the effects of the latent growth model for expectancy/credibility on RCI, the mean RCI value was reduced to -2.57 . Therefore, within the present statistical models, reliable change in GAD severity was generated only in the presence of upward changes in expectancy/credibility during the course of psychotherapy.

Therapeutic expectancy/credibility has been labeled as a common factor in psychotherapy for which excellent work has not been fully exploited (Kazdin, 2005). Ironically, most research on expectancy/credibility has examined it with an eye toward something that needs to be controlled or equalized when comparing two or more treatments. Serving that purpose, clients' expectations are typically assessed early in treatment, at the end of the first or second session. The results of the current study highlight the importance of continued assessment of therapeutic expectancy/credibility throughout treatment. Also, the fact that expectancy/credibility changed between sessions 4–7 suggests the possibility that aspects of treatment that go beyond verbal persuasion may have influenced such change (e.g., practice and engagement in enactive techniques). Further, our data suggest that change in expectancy/credibility may be a mechanism by which psychotherapy for GAD influences GAD outcome. Thus, expectancy/credibility may be a factor that therapists should actively target throughout treatment in addition to targeting symptoms of GAD, perhaps by continuing to engage clients in practicing new strategies.

Examination of Figure 1 shows that expectancy/credibility increased most dramatically between sessions 5 and 6. Within the GAD protocol, session 6 was the session when the main enactive therapeutic technique was introduced within each therapeutic condition. For example, within CT and CST, this was the session when clients were first introduced to the method by which they could restructure their own cognitions. Within SCD, this was the first session wherein clients were taught how to do self-control desensitization. This suggests the possibility that it was the introduction and practice of specific techniques (cognitive restructuring or SCD) that promised to control their anxiety that led to the most significant change in expectancy/credibility. Such a dramatic increase at the end of session six raises the question of whether such focal techniques should be introduced earlier in therapy as a means to more quickly engage clients and to counteract dropout.

Kraemer et al. (2002) have argued that in the course of a randomized controlled trial, “all mechanisms are mediators, but not all mediators are mechanisms” (p. 878). Therefore, the establishment of a variable or process as a mediator does not guarantee that it serves a mechanistic function. These authors argue that mediators establish plausibility for the role of a given process—here expectancy/credibility change—as a mechanism of therapeutic change, and that subsequent studies should aim to enhance or isolate such plausible mechanisms. Thus, in order to establish the role of expectancy/credibility as a change mechanism, it would be important to demonstrate that expectancy/credibility change as a mediator is specific to CBT compared to a placebo control condition within a study demonstrating superiority of CBT at post-treatment. Future studies might also examine the separate impact of such variables as the therapist's introduction of a particular technique, clients' in-session practice of the technique, and clients' homework practice to determine whether each of these facets impact therapeutic expectancy/credibility separately. In one study, early homework compliance mediated the relationship between baseline expectancy and treatment outcome for mixed anxiety disorders (Westra, Dozois, & Marcus, 2007), suggesting the possibility that subsequent change in expectancy may also be linked with homework compliance in some fashion. In addition, given that the current study contained three different treatment conditions, this creates the ideal circumstance for future research to explore moderators of treatment and moderated mediation.

Another avenue for future research might be to examine whether change in expectancy is linked to subsequent sudden gains in GAD symptomatology idiographically and whether sudden gains are predictive of outcome in CBT for GAD. Only one study has examined sudden gains in the treatment of GAD (Present et al., 2008) and only within the context of supportive-expressive therapy. However, sudden gains did not predict treatment outcome. This raises the question of whether such sudden gains are predictive of outcome in CBT for

GAD. Future research should also attempt to replicate the findings of the current study in a separate sample of participants with GAD.

References

- Ahmed M, Westra HA. Impact of a treatment rationale on expectancy and engagement in cognitive behavioral therapy for social anxiety. *Cognitive Therapy and Research* 2009;33:314–322.
- American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 3. Washington, DC: American Psychiatric Association; 1987. rev. ed
- American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 4. Washington, DC: American Psychiatric Association; 1994.
- Bandura, A. Social learning theory. Oxford, England: Prentice-Hall; 1977.
- Bandura, A.; Rosenthal, TL. Psychological modeling: Theory and practice. In: Garfield, SL.; Bergin, AE., editors. *Handbook of psychotherapy and behavior change*. 2. New York: Wiley; 1978.
- Barger SD, Sydeaman SJ. Does generalized anxiety disorder predict coronary heart disease risk factors independently of major depressive disorder? *Journal of Affective Disorders* 2005;88:87–91. [PubMed: 16009431]
- Barlow DH, Rapee RM, Brown TA. Behavioral treatment of generalized anxiety disorder. *Behavior Therapy* 1992;23:551–570.
- Baron RM, Kenny DA. The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology* 1986;51:1173–1182. [PubMed: 3806354]
- Beck, AT. *Cognitive therapy and the emotional disorders*. New York: International Universities Press; 1976.
- Bernstein, DA.; Borkovec, TD. *Progressive relaxation training: A manual for the helping professions*. Champaign, IL: Research Press; 1973.
- Bootzin RR, Lick JR. Expectancies in therapy research: Interpretive artifact or mediating mechanism? *Journal of Consulting and Clinical Psychology* 1979;47:852–855. [PubMed: 512144]
- Borkovec TD. Effects of expectancy on the outcome of systematic desensitization and implosive treatments for analogue anxiety. *Behavior Therapy* 1972;3:29–40.
- Borkovec TD, Abel JL, Newman H. Effects of psychotherapy on comorbid conditions in generalized anxiety disorder. *Journal of Consulting and Clinical Psychology* 1995;63:479–483. [PubMed: 7608362]
- Borkovec TD, Costello E. Efficacy of applied relaxation and cognitive-behavioral therapy in the treatment of generalized anxiety disorder. *Journal of Consulting and Clinical Psychology* 1993;61:611–619. [PubMed: 8370856]
- Borkovec TD, Mathews AM. Treatment of nonphobic anxiety disorders: A comparison of nondirective, cognitive, and coping desensitization therapy. *Journal of Consulting and Clinical Psychology* 1988;56:877–884. [PubMed: 2904928]
- Borkovec TD, Nau SD. Credibility of analogue therapy rationales. *Journal of Behavior Therapy and Experimental Psychiatry* 1972;3:257–260.
- Borkovec TD, Newman MG, Pincus AL, Lytle R. A component analysis of cognitive-behavioral therapy for generalized anxiety disorder and the role of interpersonal problems. *Journal of Consulting and Clinical Psychology* 2002;70:288–298. [PubMed: 11952187]
- Borkovec TD, Ruscio AM. Psychotherapy for generalized anxiety disorder. *Journal of Clinical Psychiatry* 2001;62:37–45. [PubMed: 11414549]
- Brown TA, Antony MM, Barlow DH. Psychometric properties of the Penn State worry questionnaire in a clinical anxiety disorders sample. *Behaviour Research and Therapy* 1992;30:33–38. [PubMed: 1540110]
- Brown TA, Barlow DH, Liebowitz MR. The empirical basis of generalized anxiety disorder. *American Journal of Psychiatry* 1994;151:1272–1280. [PubMed: 8067480]

- Brown TA, Di Nardo PA, Lehman CL, Campbell LA. Reliability of DSM-IV anxiety and mood disorders: Implications for the classification of emotional disorders. *Journal of Abnormal Psychology* 2001;110:49–58. [PubMed: 11261399]
- Bruss GS, Gruenberg AM, Goldstein RD, Barber JP. Hamilton anxiety rating scale interview guide: Joint interview and test-retest methods for interrater reliability. *Psychiatry & search* 1994;53:191–202.
- Chambless DL, Ollendick TH. Empirically supported psychological interventions: Controversies and evidence. *Annual Review of Psychology* 2001;52:685–716.
- Cole DA, Maxwell SE. Testing mediational models with longitudinal data: Questions and tips in the use of structural equation modeling. *Journal of Abnormal Psychology* 2003;112:558–577. [PubMed: 14674869]
- Deville; GJ, Borkovec TD. Psychometric properties of the credibility/expectancy questionnaire. *Journal of Behavior Therapy and Experimental Psychiatry* 2000;31:73–86. [PubMed: 11132119]
- Di Nardo, PA.; Barlow, DH. Anxiety disorders interview schedule-revised (ADIS-R). Albany: Center for Stress and Anxiety Disorders; 1988.
- Durham RC, Allan T, Hackett CA. On predicting improvement and relapse in generalized anxiety disorder following psychotherapy. *British Journal of Clinical Psychology* 1997;36:101–119. [PubMed: 9051282]
- Festinger, L. A theory of cognitive dissonance. Oxford, England: Stanford University Press; 1957.
- Fogarty CT, Sharma S, Chetty VK, Culpepper L. Mental health conditions are associated with increased health care utilization among urban family medicine patients. *Journal of the American Board of Family Medicine* 2008;21:398–407. [PubMed: 18772294]
- Goldfried MR. Systematic desensitization as training in self-control. *Journal of Consulting and Clinical Psychology* 1971;37:228–234. [PubMed: 5116681]
- Goldstein AP. Patient's expectancies and non-specific therapy as a basis for (UN) spontaneous remission. *Journal of Clinical Psychology* 1960;16:399–403. [PubMed: 13706630]
- Greenberg RP, Constantino MJ, Bruce N. Are patient expectations still relevant for psychotherapy process and outcome? *Clinical Psychology Review* 2006;26:657–678. [PubMed: 15908088]
- Hamilton M. The assessment of anxiety states by rating. *British Journal of Medical Psychology* 1959;32:50–55. [PubMed: 13638508]
- Hamilton M. A rating scale for depression. *Journal of Neurology, Neurosurgery and Psychiatry* 1960;23:56–61.
- Hardy GE, Barkham M, Shapiro DA, Reynolds S, Rees A, Stiles WB. Credibility and outcome of cognitive-behavioural and psychodynamic-interpersonal therapy. *British Journal of Clinical Psychology* 1995;34:555–569. [PubMed: 8563662]
- Härter MC, Conway; KP, Merikangas KR. Associations between anxiety disorders and physical illness. *European Archives of Psychiatry and Clinical Neuroscience* 2003;253:313–320. [PubMed: 14714121]
- Holland PW. Statistics and Causal Inference. *Journal of the American Statistical Association* 1986;81:945–960.
- Horvath P. Treatment expectancy as a function of the amount of information presented in therapeutic rationales. *Journal of Clinical Psychology* 1990;46:636–642. [PubMed: 2246373]
- Ilardi SS, Craighead WE. The role of nonspecific factors in cognitive-behavior therapy for depression. *Clinical Psychology: Science and Practice* 1994;1:138–156.
- Jacobson NS, Truax P. Clinical significance: A statistical approach to defining meaningful change in psychotherapy research. *Journal of Consulting and Clinical Psychology* 1991;59:12–19. [PubMed: 2002127]
- Jones GN, Ames SC, Jeffries SK, Scarinci IC, Brantley PJ. Utilization of medical services and quality of life among low-income patients with generalized anxiety disorder attending primary care clinics. *International Journal of Psychiatry in Medicine* 2001;31:183–198. [PubMed: 11760862]
- Jöreskog, KG.; Sörbom, D. LISREL 8.80 for Windows [Computer Software]. Lincolnwood, IL: Scientific Software International, Inc; 2006.

- Kazdin AE. Treatment outcomes, common factors, and continued neglect of mechanisms of change. *Clinical Psychology: Science and Practice* 2005;12:184–188.
- Kazdin AE, Krouse R. The impact of variations in treatment rationales on expectancies for therapeutic change. *Behavior Therapy* 1983;14:657–671.
- Kazdin AE, Wilcoxon LA. Systematic desensitization and nonspecific treatment effects: A methodological evaluation. *Psychological Bulletin* 1976;83:729–758. [PubMed: 12523]
- Kenny, DA.; Kashy, DA.; Bolger, N. Data analysis in social psychology. In: Gilbert, DT.; Fiske, ST.; Lindzey, G., editors. *The handbook of social psychology*. 4. Vol. 1 & 2. New, York: McGraw-Hill; 1998. p. 233-265.
- Kessler RC, Wittchen HU. Patterns and correlates of generalized anxiety disorder in community samples. *The Journal of Clinical Psychiatry* 2002;63(Suppl 8):4–10. [PubMed: 12044107]
- Kobak KA, Reynolds WM, Geist JH. Development and validation of a computer-administered version of the Hamilton Rating Scale. *Psychological Assessment* 1993;5:487–492.
- Kraemer HC, Wilson GT, Fairburn CG, Agras WS. Mediators and moderators of treatment effects in randomized clinical trials. *Archives of General Psychiatry* 2002;59:877–884. [PubMed: 12365874]
- Lavie CJ, Milani RV. Prevalence of anxiety in coronary patients with improvement following cardiac rehabilitation and exercise training. *American Journal of Cardiology* 2004;93:336–339. [PubMed: 14759385]
- Mandys E, Dolan CV, Molenaar PCM. Two aspects of the simplex model: Goodness of fit to linear growth curve structures and the analysis of mean trends. *Journal of Educational and Behavioral Statistics* 1994;19(3):201–215.
- McGlinchey JB, Atkins DC, Jacobson NS. Clinical significance methods: Which one to use and how useful are they? *Behavior Therapy* 2002;33:529–550.
- Mehl-Madrona LE. Prevalence of psychiatric diagnoses among frequent users of rural emergency medical services. *Canadian Journal of Rural Medicine* 2008;13:22–30. [PubMed: 18208649]
- Meyer TJ, Miller ML, Metzger RL, Borkovec TD. Development and validation of the Penn State worry questionnaire. *Behaviour Research and Therapy* 1990;28:487–495. [PubMed: 2076086]
- Molina, S.; Borkovec, TD. The Penn State worry questionnaire: Psychometric properties and associated characteristics. In: Davey, GCL.; Tallis, F., editors. *Worrying: Perspectives on theory, assessment and treatment*. Oxford, England: Wiley; 1994. p. 265-283.
- Moras K, Di Nardo PA, Barlow DH. Distinguishing anxiety and depression: Reexamination of the reconstructed Hamilton scales. *Psychological Assessment* 1992;4:224–227.
- Nau SD, Caputo JA, Borkovec TD. The relationship between credibility of therapy and simulated therapeutic effects. *Journal of Behavior Therapy and Experimental Psychiatry* 1974;5:129–133.
- Newman MG. Recommendations for a cost-offset model of psychotherapy allocation using generalized anxiety disorder as an example. *Journal of Consulting and Clinical Psychology* 2000;68:549–555. [PubMed: 10965629]
- Newman MG, Przeworski A, Fisher AJ, Borkovec TD. Diagnostic comorbidity in adults with generalized anxiety disorder: Impact of comorbidity on psychotherapy outcome and impact of psychotherapy on comorbid diagnoses. *Behavior Therapy* 2010;41:59–72. [PubMed: 20171328]
- Ormel J, VonKorff M, Üstün TB, Pini S, Korten A, Oldehinkel T. Common mental disorders and disability across cultures: Results from the WHO collaborative study on psychological problems in general health care. *Journal of the American Medical Association* 1994;272:1741–1748. [PubMed: 7966922]
- Present J, Crits-Christoph P, Gibbons MBC, Hearon B, Ring-Kurtz S, Worley, M, Gallop R. Sudden gains in the treatment of generalized anxiety disorder. *Journal of Clinical Psychology* 2008;64:119–126. [PubMed: 18161042]
- Riskind JH, Beck AT, Brown G, Steer RA. Taking the measure of anxiety and depression: Validity of the reconstructed Hamilton scales. *Journal of Nervous and Mental Disease* 1987;175:474–479. [PubMed: 3625186]
- Schonfeld WH, Verboncoeur CJ, Fifer SK, Lipschutz RC, Lubeck DP, Buesching DP. The functioning and well-being of patients with unrecognized anxiety disorders and major depressive disorder. *Journal of Affective Disorders* 1997;43:105–119. [PubMed: 9165380]

- Spielberger, CD.; Gorsuch, RL.; Lushene, R.; Vagg, PR.; Jacobs, GA. Manual for the state-trait anxiety inventory STAI (Form r). Palo Alto, CA: Mind Garden; 1983.
- Steketee G, Chambless DL. Methodological issues in prediction of treatment outcome. *Clinical Psychology Review* 1992;12:387–400.
- Tang TZ, DeRubeis RJ. Sudden gains and critical sessions in cognitive-behavioral therapy for depression. *Journal of Consulting and Clinical Psychology* 1999;67:894–904. [PubMed: 10596511]
- Todaro JF, Shen BJ, Raffa SD, Tilkemeier PL, Niaura R. Prevalence of anxiety disorders in men and women with established coronary heart disease. *Journal of Cardiopulmonary Rehabilitation and Prevention* 2007;27:86–91. [PubMed: 17558244]
- Westra HA, Dozois DJA, Marcus M. Expectancy; homework compliance, and initial change in cognitive-behavioral therapy for anxiety. *Journal of Consulting and Clinical Psychology* 2007;75:363–373. [PubMed: 17563153]
- Wetherell JL, Hopko DR, Diefenbach GJ, Averill PM, Beck JG, Craske MG, et al. Cognitive-behavioral therapy for late-life generalized anxiety disorder: Who gets better? *Behavior Therapy* 2005;36:147–156.
- Whitehurst GJ. Interrater agreement for journal manuscript reviews. *American Psychologist* 1984;39:22–28.
- Wilkins W. Expectancies in therapy research: Discriminating among heterogeneous nonspecifics. *Journal of Consulting and Clinical Psychology* 1979;47:837–845. [PubMed: 389966]
- Williams, SL. Guided mastery treatment of agoraphobia: Beyond stimulus exposure. In: Hersen, M.; Eisler, RM.; Miller, PM., editors. *Progress in behavior modification*. Thousand Oaks, CA: Sage Publications; 1990. p. 89-121.
- Wittchen HU. Generalized anxiety disorder: Prevalence, burden, and cost to society. *Depression and Anxiety* 2002;16:162–171. [PubMed: 12497648]

FIGURE 1.
Change in Expectancy/Credibility from Session 4 to Session 7 of CBT.

FIGURE 2.
Three-Step Test for the Mediating Role of Change in Expectancy on Treatment Outcome.

FIGURE 3.
Relationship Between Expectancy and Symptom Severity over First Seven Sessions of CBT
for GAD.