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Distress and avoidance in Generalized Anxiety Disorder: Exploring the relationships with intolerance of uncertainty and worry

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Abstract

Theory and research suggest treatments targeting experiential avoidance may enhance outcomes for patients with GAD (Roemer & Orsillo, 2002; 2007). Preliminary findings demonstrate that distress about emotions and avoidance of internal experiences share unique variance with GAD above and beyond chronic reports of worry (Roemer, Salters, Raffa, & Orsillo, 2005). The purpose of the present study was to extend previous findings to explore the role of experiential avoidance and distress about emotions in a treatment-seeking sample with a principal diagnosis of GAD compared with demographically matched non-anxious controls, and to explore their shared relationship with two putative psychopathological processes in GAD: intolerance of uncertainty and worry. Patients with GAD reported significantly higher levels of experiential avoidance and distress about emotions compared to non-clinical controls while controlling for depressive symptoms, and measures of these constructs significantly predicted GAD status. Additionally, experiential avoidance and distress about anxious, positive, and angry emotions shared unique variance with intolerance of uncertainty when negative affect was partialled out, while only experiential avoidance and distress about anxious emotions shared unique variance with worry. Discussion focuses on implications for treatment as well as future directions for research.

Keywords

Generalized Anxiety Disorder; Worry; Experiential Avoidance; Acceptance-based Behavior Therapy; Intolerance of Uncertainty

The defining feature of Generalized Anxiety Disorder (GAD) is excessive and uncontrollable worry (DSM-IV-TR; American Psychiatric Association, 2000). Prevalence rates estimate GAD affects 5-8% of the population (Kessler, Walters, & Wittchen, 2004), and medical costs for treating GAD, controlling for demographic factors and other diseases, place it among the most expensive anxiety disorders to treat, second only to PTSD (Marciniak, et al., 2005). GAD is also one of the most treatment resistant anxiety disorders (Roemer, Orsillo, & Barlow, 2002). Although cognitive-behavioral approaches produce significant improvement in GAD symptoms compared to placebo and no-treatment conditions, a significant minority of clients who receive this treatment do not achieve high levels of end-state functioning (Borkovec & Ruscio, 2001; Gould, Safren, Washington, & Otto, 2004).

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Research aimed at elucidating the mechanisms that may serve to maintain worry, the principal process in GAD, is critical to inform advances in treatment. Borkovec (1994) proposed that worry serves an avoidant function. Despite concomitant reports that worriers describe the process of worrying as aversive (Ruscio & Borkovec, 2004; Wells, 1995), they also endorse positive beliefs about worry; that it might help them prepare for, problem solve, or superstitiously avoid future catastrophic events (e.g., Borkovec, Hazlett-Stevens, & Diaz, 1999). Further, self-report of the use of worry to distract from more distressing topics distinguishes those with GAD from sub-clinical cases (Borkovec & Roemer, 1995; Freeston, Rhéaume, Letarte, Dugas, & Ladouceur, 1994). Evidence from basic research supports the notion that worry may serve a positive, avoidant function (Borkovec, Alcaine, & Behar, 2004). For example, worrying prior to a fearful image reduces physiological reactivity in the short term, although it maintains a moderate response over time (Borkovec & Hu, 1990).

Intolerance of uncertainty, defined as the “tendency to react negatively on an emotional, cognitive, and behavioral level to uncertain situations and events” (Dugas, Buhr, & Ladouceur, 2004, p. 143), is also proposed to be a defining feature of individuals with GAD. Specifically, intolerance of uncertainty is conceptualized as a cognitive schema with which an individual perceives the environment, while worry is proposed to be a mental reaction to the uncertainty (Dugas, et al., 2004). As noted above, worry is a cognitive coping response that serves an avoidant function (Borkovec et al., 2004). Accordingly, for individuals who have a low threshold for tolerating uncertainty and find uncertainty stressful and upsetting, worry may function as a cognitive coping response to avoid the distress associated with uncertainty. For example, experimental manipulations of intolerance of uncertainty show a direct relationship between high and low uncertainty and level of worrying (Ladouceur, Gosselin, & Dugas, 2000). Further, basic research has demonstrated the unique contribution of intolerance of uncertainty in worry severity over and above the effects of depression and anxiety (Dugas et al., 1997), and GAD severity even after controlling for age, gender and depression (Dugas et al., 2007).

In a related area of research, there is growing evidence that individuals with GAD may struggle with their internal experiences (thoughts, emotions, physical sensations). For example, distress about emotions (particularly anxiety and depression) and difficulties with emotion regulation contribute unique variance to GAD severity, and significantly discriminate between individuals with and without GAD (Mennin, Heimberg, Turk, & Fresco, 2005). These recent findings have stimulated several new treatment development efforts. For example, Mennin (2004) is examining the efficacy of a newly developed treatment aimed at enhancing emotion regulation.

We (Roemer & Orsillo, 2002; 2007) have also developed a treatment for GAD integrating Borkovec's (1994) conceptualization of the avoidant function of worry with Hayes, Wilson, Gifford, Follette, and Strosahl's (1996) proposal that experiential avoidance (the tendency to attempt to avoid one's thoughts, feelings, bodily sensations) accounts for many of the problems and behaviors associated with several different forms of psychopathology. Our (Roemer & Orsillo, 2007) model of GAD consists of three elements. First, GAD is thought to be maintained by the way in which clients *relate to their internal experiences*. This relationship can be characterized as reactive, judgmental, and “fused” (Hayes et al., 1996). The second element of the model is *experiential avoidance*, or emotional, cognitive, and behavioral efforts to avoid or escape distressing thoughts, feelings, memories and sensations (Hayes et al., 1996). Clients engage in these efforts hoping to decrease their distress, yet they often paradoxically lead to increased symptomatology (e.g., Hayes et al., 1996). These two elements are inter-related; if a client is fused with her internal experiences, so that she experiences them as potentially overwhelming and dangerous, she may be highly motivated to engage in strategies aimed at avoiding or changing them. The paradoxical effects of these efforts may in turn increase distress about, reactivity toward and judgment of these internal experiences. The final element of the

model is *behavioral restriction or constriction*, representing the ways that individuals who are struggling with internal experiences often fail to engage in actions that are consistent with what matters most to them (i.e., valued action, Wilson & Murrell, 2004), further perpetuating their distress and dissatisfaction. Based on this conceptualization, we (Roemer & Orsillo, 2002; 2007) have developed an acceptance-based behavioral treatment aimed at reducing avoidance among those with GAD.

While much of the basic research on worry and GAD supports an experiential avoidance model, to date, only one study has directly tested the relationship between experiential avoidance and GAD. Roemer, Salters, Raffa, and Orsillo (2005) found that reports of experiential avoidance and distress about emotions predicted GAD severity in a female analogue sample of college students above and beyond the shared variance with worry, anxiety, and depression. However, these findings are constrained by a female-only sample and the absence of a clinical sample for comparison.

In order to extend the findings of Roemer et al. (2005), and to replicate the findings by Mennin et al. (2005) that those with GAD report distress about their emotions, we examined components of both distress about emotions and experiential avoidance in a treatment seeking sample with a principal diagnosis of GAD compared to demographically-matched non-anxious controls. Specifically, we predicted that individuals with a diagnosis of GAD would exhibit elevated reports of experiential avoidance and distress about emotions while controlling for symptoms of depression and that these variables could discriminate between individuals with and without a diagnosis of GAD. To further place the present study in the context of known GAD correlates, we also predicted that experiential avoidance and distress about emotions would explain unique variance with worry and intolerance of uncertainty while controlling for symptoms of depression. To our knowledge, the relationship between experiential avoidance and distress about emotions with intolerance of uncertainty has yet to be examined. If worry is conceptualized as a strategy of avoidance, and individuals worry to avoid uncertainty, then it should follow that experiential avoidance and distress about emotions should explain unique variance in each process.

Method

Participants

Ninety participants were recruited for this study. The clinical group was comprised of 50 participants who sought treatment at the Center for Anxiety and Related Disorders at Boston University (and participated in one of two treatment studies; Roemer & Orsillo, 2007; Roemer, Orsillo, & Salters-Pedneault, in press) and were assessed using the Anxiety Disorders Interview Schedule for DSM-IV - Lifetime Version (ADIS-IV-L; Di Nardo, Brown, & Barlow, 1994). Inclusion criteria for the clinical sample included (a) receiving a principal diagnosis of GAD; (b) receiving a clinician determined ADIS severity rating for GAD of at least 4 (on an 8 point scale); (c) absence of current suicidal intent (those with suicidal ideation were eligible); (d) not meeting criteria for current bipolar disorder, substance dependence disorder, or psychotic disorder; (e) being 18 or older; and (f) agreeing to participate in a study examining the efficacy of an acceptance-based behavioral treatment for GAD. Ten participants met criteria for GAD subsumed within Major Depressive Disorder (MDD; $n = 6$), Dysthymia ($n = 2$), and Anxiety Disorder Not Otherwise Specified ($n = 2$), and seven participants did not complete the full packet of study measures and thus were excluded from data analyses. This left a total of 33 participants (61% female) in the clinical group with ages ranging from 19-66 ($M = 33.58$, $SD = 11.14$) and clinician-determined ADIS severity ratings ranging from 4-8 ($M = 5.73$, $SD = .80$). Ninety-four percent of participants self-identified as White, 3% as Black/African American, and 3% as Latino/a. Twenty participants had at least one comorbid diagnosis of

clinical severity. The most common included social phobia ($n = 7$), MDD ($n = 5$), and Panic Disorder with Agoraphobia ($n = 4$).

For the non-GAD group, 41 non-anxious participants were recruited from the Metropolitan Boston community through internet advertisements, email, and flyer postings for paid research participation. Using a similar screening procedure for recruiting non-anxious individuals as Moscovitch and Hoffmann (2006), initial screening for anxiety and mood disorder was completed by phone. A follow-up interview was conducted in-person using the Mini-ADISIV (Brown, Di Nardo, & Barlow, 1994), an abbreviated version of the ADIS-IV-L, focusing only on current diagnoses. Participants currently on medication, receiving psychological services, or meeting criteria for an anxiety or mood disorder in the past 12 months were excluded (with the exception of participants reporting a specific phobia). Data for eight participants were not included in the present analyses in order to maintain similarity in demographic composition between groups¹. Thirty-three participants (61% female) with ages ranging from 19-57 ($M = 30.24$, $SD = 9.72$) were included in the non-GAD group. Eighty-eight percent of participants self-identified as White, 3% as Black/African American, 3% Latino/a, and 6% as Asian. Participants were reimbursed \$30 for taking part in the study.

Measures

Anxiety Disorders Interview Schedule for DSM-IV (ADIS-IV; Di Nardo et al., 1994)—The ADIS-IV comprehensively evaluates DSM-IV anxiety, mood, substance use, and somatoform disorders and elicits information necessary for differential diagnoses (e.g., mania, substance and alcohol use). In addition to providing diagnostic information on both GAD and any other comorbid diagnoses for anxiety and mood disorders, the ADIS-IV includes a clinician severity rating (CSR) for each diagnosis received ranging from 0 (none) to 8 (very severely disturbing/disabling). A CSR of 4 (definitely disturbing/disabling) or higher indicates meeting formal DSM-IV diagnostic criteria for a disorder. Interrater reliability of GAD diagnostic category over a two-week period yielded a kappa coefficient of .67 at the same site the current study was conducted and using the same training procedures (Brown, Di Nardo, Lehman, & Campbell, 2001). The abbreviated version used in recruiting the non-anxious participants differs from the lifetime version in that information regarding diagnostic history (including information related to onset and remission) is omitted (Brown et al., 1994).

Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990)—The PSWQ is a widely used 16-item self-report questionnaire that assesses an individual's general tendency to worry excessively. It specifically assesses the intensity and excessiveness of worry without reference to specific content of the worries. Each item presents a statement followed by a 5-point Likert-type scale ranging from 1 (Not at all typical of me) to 5 (Very typical of me). In the validation study, the measure showed excellent internal consistency (α range = .93-.97) and test-retest reliability of $r = .93$ at one month.

Depression and Anxiety Stress Scales - 21-item version (DASS-21; Lovibond & Lovibond, 1995)—The DASS-21 is an abbreviated version of the DASS-42 and includes three subscales: depression, anxiety (i.e., anxious arousal), and stress (i.e., tension/negative affect). Respondents rate the extent to which each statement applies during the past week on

¹We used a hierarchical stratification method for selecting a nonclinical sample to match the GAD group focusing first on gender, then age, and finally, race/ethnicity. The number of men and women for both groups were identical. A grouping strategy was used to match for age using the following age groups (18-21, 22-26, 27-31, 32-36, 37-47, 43-58, and not specified). We also attempted to ensure equivalence in ethnicity within these parameters. As noted in the text, for the current study, 17 participants were dropped from the larger clinical sample because they either met criteria for GAD subsumed within MDD or were missing measures. In order to more accurately match this clinical subsample for the analyses in the present paper, we selected 33 participants from the nonclinical sample using the same hierarchical stratification method as when recruiting; thus dropping 8 participants from the control group.

a 4-point Likert-type scale ranging from 0 (Did not apply to me at all) to 3 (Applied to me very much). Responses are summed for each scale, with higher values indicating increased distress. Factor analysis of the 21-item version yields three factors and internal consistency for the subscales range from good to excellent (Antony, Bieling, Cox, Enns, & Swinson, 1998). The measure also demonstrates strong correlations with other measures of general distress in clinical (Antony et al., 1998) and nonclinical samples (Henry & Crawford, 2005). Only the depression subscale was used in the present study to partially account for negative affect.

Intolerance of Uncertainty Scale - English Version (IUS; Buhr & Dugas, 2002)—

The IUS is a 27-item measure that assesses intolerance of uncertainty. Research demonstrates that intolerance of uncertainty is strongly correlated with worry while controlling for anxiety and depression, supporting it as a distinct construct (Freeston et al., 1994). Responses are scored on a 5-point Likert-type scale ranging from 1 (not at all characteristic of me) to 5 (entirely characteristic of me). Responses for items are summed and totaled with higher scores reflecting more intolerance of uncertainty. Internal consistency was excellent for the English version ($\alpha = .94$), with a reliability coefficient of $r = .74$ for five week test-retest.

Acceptance and Action Questionnaire, 16-item version (AAQ; Hayes, et al., 2004)—

The AAQ, is a self-report measure that assesses emotional avoidance and emotion-focused inaction. As the scale is still under development, there are several versions currently in use (9-item, 16-item, and 32-item). From the initial version, which included a pool of 32-items, factor analyses supported the economy of a 16-item version and 9-item version. However, based on the low internal consistency for the 9-item version (Cronbach's $\alpha = .70$, considered adequate for research purposes, Groth-Marnat, 2003), we decided to use the 16-item version. Sample items include “It's OK to feel depressed and anxious” (reverse scored) and “In order for me to do something important, I have to have all my doubts worked out.” Participants are asked to mark the degree to which each statement applies to their life on a 7-point Likert-type scale ranging from 1 (never true) to 7 (always true). Scores range from 16 to 112 with elevations in scores corresponding to high experiential avoidance, or the unwillingness to remain in contact with particular feelings and thoughts, whereas low scores reflect acceptance and action. The AAQ significantly correlates with other measures of psychopathology and more specific measures of experiential avoidance even when controlling for social desirability (Hayes et al., 2004).

Affective Control Scale (ACS; Williams, Chambless, & Ahrens, 1997)—

The ACS is a 42-item self-report measure that assesses distress about and fear of losing control while experiencing strong affective states such as anxiety, depression, anger, and positive affective states. Responses are scored on a 7-point Likert-type scale ranging from “very strongly disagree” (1) to “very strongly agree” (7). The total score is computed by calculating the mean score of all 42 responses, and subscale scores are derived by computing the means of the items that comprise each subscale; higher scores indicate greater distress of emotional response. Internal consistency for the total scale as well as for subscales indicate moderate to excellent reliability (Williams et al., 1997). Convergent validity has been established in a college analogue sample with measures of neuroticism; further the ACS demonstrated predictive validity in lab induced fear of bodily sensations related to panic among college students while controlling for state and trait anxiety (Berg, Shapiro, Chambless, & Ahrens, 1998).

Procedure

All participants in the GAD group were assessed prior to beginning treatment. Participants in the non-GAD group were seen for one session in which the Mini-ADIS-IV and questionnaires were administered.

Results

Preliminary Analysis

The Kolmogorov-Smirnov (K-S) statistic was used to test for normality. While the GAD group did not violate assumptions of normality, leptokurtosis and positive skew were evident for the non-GAD group on the ACS Depression subscale, DASS-DEP and DASS-ANX subscales, PSWQ and the IUS. Square-root transformation was conducted with the IUS in both the GAD and non-GAD groups, but not with the other measures as the uneven distributions on these other measures were the result of the restricted range and lower instances of self-reporting distress (as was the nature of the sample; Tabachnick & Fidell, 2001). That is, similar to screening procedures in Mennin et al. (2005), individuals from the community were pre-screened and included in the non-GAD sample because they did not report psychological distress resulting from an anxiety or mood disorder.

A series of ANOVAs were conducted to explore baseline differences in study variables using gender and ethnicity (White vs. non-White grouping strategy was used to prevent cell sizes with no cases) as grouping variables. The only significant finding was that within the GAD group only, men reported greater distress about anger than women on the ACS-ANG subscale. Thus, gender was included as a covariate for analyses using this subscale when conducting within-group analyses for the GAD group.

Table 1 presents the ranges, means, standard deviations, alphas, and intercorrelations for the study variables for the entire sample. As expected, intolerance of uncertainty, worry, and depression, were significantly correlated with the measures of experiential avoidance and distress about emotions.

In order to examine the relationship of experiential avoidance, distress about emotions, intolerance of uncertainty, and worry in GAD specifically, we performed a series of partial correlations controlling for negative affect by partialling out self-reported depression using participants in the GAD group. The correlations between experiential avoidance, distress about anxiety, and worry were significant when controlling for self-reported depression while distress about depressive, positive, and angry emotions did not remain significant (see Table 2). However, the correlations between experiential avoidance and distress about anxious, positive, and angry emotions and intolerance of uncertainty remained significant, even while controlling for depression (and for the ACS-ANG subscale, gender), while distress about depressive emotions was not significant.

GAD versus Non-GAD Comparisons on Experiential Avoidance, and Distress about Emotions

In order to test the hypothesis that the GAD group would report increased experiential avoidance and distress about emotions compared to the non-GAD group, a MANCOVA was conducted using the AAQ, and ACS subscales as the dependent variables while controlling for self-reported depression to partially account for negative affect. Box's Test of homogeneity of variance-covariance was significant, thus Pillai's Trace was used as a conservative test to examine the multivariate effect (Tabachnick & Fidell, 2001). As predicted, there was a significant main effect of group [$F(5,58) = 22.80, p < .0005$; Pillai's Trace = .66; $\eta^2_p = .66$]. Univariate tests revealed that individuals with GAD reported higher rates of experiential avoidance ($\eta^2_p = .51$) and greater distress about anxious ($\eta^2_p = .61$), depressive ($\eta^2_p = .25$), angry ($\eta^2_p = .17$), and positive ($\eta^2_p = .11$) emotions.

Following the results of the MANCOVA, we conducted a Discriminant Function Analysis (DFA) to examine the predictive utility of the ACS subscales and the AAQ in classifying GAD status. One function was generated and was significant [Wilk's $\Lambda = .19, \chi^2(5, N = 66) = 101.64$,

$p < .0005$], indicating that the combination of predictors significantly discriminated between individuals with and without GAD, with GAD status accounting for 90% of the function variance. ACS-ANX ($r = .85$), AAQ ($r = .80$), and ACS-DEP ($r = .52$) demonstrated the strongest relationship (determined by r 's $> .5$) to GAD status. Original classification results revealed 98.5% of the total sample was correctly classified (97% of the GAD group and 100% of the non-GAD group) and a cross-validation process where the total sample was randomly split to generate the discriminant function and then tested on the other half of the sample, revealed 98.5% of the total sample was correctly classified (97% of the GAD group and 100% of the non-GAD group).

Discussion

The findings from the present study lend further support for a model that highlights the relevance of experiential avoidance and distress about emotions in understanding GAD. As predicted, participants with a diagnosis of GAD reported significantly greater distress about emotions and experiential avoidance compared to demographically-matched non-anxious controls. Additionally, these measures of distress about emotions and avoidance of internal experiences were able to significantly classify GAD status, consistent with previous research (Mennin et al., 2005; Roemer et al., 2005). Finally, distress about anxiety and experiential avoidance accounted for unique variance in intolerance of uncertainty and worry severity while controlling for self-reported depression. This finding replicates and extends the results from a college analogue sample (Roemer et al., 2005) to a treatment-seeking sample diagnosed with GAD. Taken collectively, these findings suggest that distress and avoidance of internal experiences may be an important feature in understanding GAD. Thus, treatments specifically targeting these mechanisms may enhance client outcomes.

As predicted, experiential avoidance and distress about anxious, positive, and angry emotions were significantly correlated with intolerance of uncertainty even while controlling for depression and gender. Although the focus of intolerance of uncertainty has been on the tendency to react negatively to uncertain situations and events, it may be the internal state elicited by uncertainty that motivates worry and avoidance. That is, if individuals with a low threshold for tolerating uncertainty engage in worry, the function this strategy might serve is as a way to avoid the distress associated with their internal experience.

Individuals with GAD reported significantly more distress about depressive, positive, and angry emotions than those in the comparison group, suggesting a broad intolerance of difficult and painful thoughts, feelings and sensations; however, these variables were not significantly correlated with worry severity within the clinical group. It is possible that the correlational analyses were under-powered given the restricted range of scores on the PSWQ. Roemer and colleagues (Study 2; 2005) found a moderate to large effect size for the association between distress about depressive emotions and worry in a treatment-seeking sample with GAD, although the association was not statistically significant. Future research is needed to further examine these relationships.

Although these findings are promising in advancing our understanding of GAD, several methodological limitations of the current study should be considered. Most importantly, this study relied on self-report methodology to assess experiential avoidance and did not account for response biases and experiences that may be outside of awareness. Self-report methodology can be considered valid to the extent that the individual responding can accurately assess the domain to which she or he is responding. This point is extremely important to consider, as Mennin et al. (2005) have demonstrated that individuals with GAD have difficulty recognizing and describing their internal experiences. Therefore, reports obtained may not accurately reflect the internal experiences of the individuals. Indeed if this is the case, the findings from the

present study may be an underestimation of the degree to which individuals with GAD engage in experiential avoidance. It has been argued the AAQ may not distinguish experiential avoidance from other theoretical constructs such as general negative affectivity (e.g., Zvolensky, Feldner, Leen-Feldner, & Yartz, 2005). Although we attempted to partial out the effects of negative affect by controlling for depressive symptoms, more research into this possibility is needed. Measure development and refinement is needed to guide future research in this area and investigations integrating non-self report methodologies may shed further light on these processes.

Given the co-occurring secondary disorders in the clinical group, it is not clear whether the observed differences were specifically due to GAD, or the secondary diagnosis. Similarly, the lack of a comparison group with another Axis I diagnosis limits conclusions about the specificity of experiential avoidance in predicting GAD. These last two points, however, may be considered a relative strength of the experiential avoidance model. Given theory and research with a wide range of disorders (see Hayes et al., 2006, for a meta-analytic review), it is likely that experiential avoidance is a common factor in the presentation of general psychopathology.

Finally, the characteristics of the sample are a limitation that should be noted. Participants predominantly identified as White. It will be important to determine whether these same relationships emerge among samples of GAD clients from other racial backgrounds. Sampling bias is another limitation that should be considered in light of the findings. The participants in the clinical group were self-selected based on their decision to seek treatment for GAD, while those in the control group were recruited based on predetermined criteria to represent a healthy population. The use of such extreme groups, while providing robust power for statistical analyses, may not accurately reflect the generality of the variables of interest in the general population.

Despite these limitations, the findings from the present study provide partial support that distress and avoidance of internal experiences such as emotion are characteristic of GAD and may contribute to the development and maintenance of the disorder. Thus, treatments that integrate the encouragement of acceptance of internal experiences (Ladouceur et al., 2000; Mennin, 2004; Roemer & Orsillo, 2007) with existing cognitive-behavioral approaches may enhance outcome (Dugas & Koerner, 2005) and improve quality of life among those seeking treatment for GAD.

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References

- American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 4th ed.. Author; Washington, DC: 2000.
- Antony MM, Bieling PJ, Cox BJ, Enns MW, Swinson RP. Psychometric properties of the 42-item and 21-item versions of the depression anxiety stress scales in clinical groups and a community sample. *Psychological Assessment* 1998;10:176–181.
- Berg CZ, Shapiro N, Chambless DL, Ahrens AH. Are emotions frightening? II: An analogue study of fear of emotion, interpersonal conflict, and panic onset. *Behaviour Research and Therapy* 1998;36:3–15. [PubMed: 9613013]
- Borkovec, TD. The nature, functions, and origins of worry. In: Davey, GCL.; Tallis, F., editors. *Worrying: Perspectives on theory, assessment and treatment*. Wiley; New York: 1994. p. 5-34.

- Borkovec, TD.; Alcaine, OM.; Behar, E. Avoidance theory of worry and generalized anxiety disorder. In: Heimberg, RG.; Turk., CL.; Mennin, DS., editors. *Generalized anxiety disorder: Advances in research and practice*. Guilford; New York: 2004. p. 77-108.
- Borkovec TD, Hazlett-Stevens H, Diaz ML. The role of positive beliefs about worry in generalized anxiety disorder and its treatment. *Clinical Psychology and Psychotherapy* 1999;6:126–138.
- Borkovec TD, Hu S. The effect of worry on cardiovascular response to phobic imagery. *Behaviour Research and Therapy* 1990;28:69–73. [PubMed: 2302151]
- Borkovec TD, Roemer L. Perceived functions of worry among generalized anxiety disorder subjects: Distraction from more emotionally distressing topics? *Journal of Behavior Therapy and Experimental Psychiatry* 1995;26:25–30. [PubMed: 7642757]
- Borkovec TD, Ruscio AY. Psychotherapy for generalized anxiety disorder. *Journal of Clinical Psychiatry* 2001;62:37–42. [PubMed: 11414549]
- Brown, TA.; Di Nardo, PA.; Barlow, DH. *Anxiety Disorders Interview Schedule for DSM-IV: Adult and Lifetime Version, Clinician Manual*. Psychological Corporation; San Antonio, TX: 1994.
- 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]
- Buhr K, Dugas MJ. The intolerance of uncertainty scale: Psychometric properties of the English version. *Behaviour Research and Therapy* 2002;40:931–945. [PubMed: 12186356]
- Di Nardo, PA.; Brown, TA.; Barlow, DH. *Anxiety Disorders Interview Schedule for DSM-IV: Lifetime version*. Psychological Corporation; San Antonio, TX: 1994.
- Dugas, MJ.; Buhr, K.; Ladouceur, R. The role of intolerance of uncertainty in etiology and maintenance. In: Heimberg, RG.; Turk., CL.; Mennin, DS., editors. *Generalized anxiety disorder: Advances in research and practice*. Guilford; New York: 2004. p. 143-163.
- Dugas MJ, Freeston MH, Ladouceur R. Intolerance of uncertainty and problem orientation in worry. *Cognitive Therapy and Research* 1997;21:593–606.
- Dugas MJ, Gagnon F, Ladouceur R, Freeston MH. Generalized anxiety disorder: A preliminary test of a conceptual model. *Behaviour Research and Therapy* 1998;36:215–226. [PubMed: 9613027]
- Dugas MJ, Koerner N. Cognitive-behavioral treatments for generalized anxiety disorder: Current status and future directions. *Journal of Cognitive Psychotherapy: An International Quarterly* 2005;19:61–81.
- Dugas MJ, Savard P, Gaudet A, Turcotte J, Laugesen N, Robichaud M, Francis K, Koerner N. Can the components of a cognitive model predict the severity of generalized anxiety disorder? *Behavior Therapy* 2007;38:169–178. [PubMed: 17499083]
- Freeston MH, Rhéaume J, Letarte H, Dugas MJ, Ladouceur R. Why do people worry? *Personality and Individual Differences* 1994;17:791–802.
- Groth-Marnat, G. *Handbook of psychological assessment*. 4th ed.. John Wiley & Sons; Hoboken, NJ: 2003.
- Gould, RA.; Safren, SA.; Washington, DO.; Otto, MW. A Meta-Analytic Review of Cognitive-Behavioral Treatments. In: Heimberg, RG.; Turk., CL.; Mennin, DS., editors. *Generalized anxiety disorder: Advances in research and practice*. Guilford; New York: 2004. p. 248-264.
- Hayes SC, Luoma JB, Bond FW, Masuda A, Lillis J. Acceptance and commitment therapy: Model, process and outcomes. *Behaviour Research and Therapy* 2006;44:1–25. [PubMed: 16300724]
- Hayes SC, Strosahl K, Wilson KG, Bissett RT, Pistorello J, Toarmino D, Polusny MA, Dykstra TA, Batten SV, Bergan J, Stewart SH, Zvolensky MJ, Eifert GH, Bond FW, Forsyth JP, Karekla M, Mccurry SM. Measuring experiential avoidance: A preliminary test of a working model. *The Psychological Record* 2004;54:553–578.
- Hayes SC, Wilson KG, Gifford EV, Follette VM, Strosahl K. Experiential avoidance and behavioral disorders: A functional dimensional approach to diagnosis and treatment. *Journal of Consulting and Clinical Psychology* 1996;64:1152–1168. [PubMed: 8991302]
- Henry JD, Crawford JR. The short-form version of the depression anxiety stress scales (DASS-21): Construct validity and normative data in a large non-clinical sample. *British Journal of Clinical Psychology* 2005;44:227–239. [PubMed: 16004657]

- Kessler, RC.; Walters, EE.; Wittchen, H. Epidemiology. In: Heimberg, RG.; Turk., CL.; Mennin, DS., editors. Generalized anxiety disorder: Advances in research and practice. Guilford; New York: 2004. p. 29-50.
- Ladouceur R, Dugas MJ, Freeston MH, Leger E, Gagnon F, Thibodeau N. Efficacy of a cognitive-behavioral treatment for generalized anxiety disorder: Evaluation in a controlled clinical trial. *Journal of Consulting and Clinical Psychology* 2000;68:957–964. [PubMed: 11142548]
- Ladouceur R, Gosselin P, Dugas MJ. Experimental manipulation of intolerance of uncertainty: A study of a theoretical model of worry. *Behaviour Research and Therapy* 2000;38:933–941. [PubMed: 10957827]
- Lovibond, SH.; Lovibond, PF. Manual for the Depression Anxiety Stress Scales. The Psychology Foundation of Australia; Sydney: 1995.
- Marciniak MD, Lage MJ, Dunayevich E, Russell JM, Bowman L, Landbloom RP, Levine LR. The cost of treating anxiety: The medical and demographic correlated that impact total medical costs. *Depression and Anxiety* 2005;21:178–184. [PubMed: 16075454]
- Mennin DS. Emotion regulation therapy for generalized anxiety disorder. *Clinical Psychology and Psychotherapy* 2004;11:17–29.
- Mennin DS, Heimberg RG, Turk CL, Fresco DM. Preliminary evidence for an emotion dysregulation model of generalized anxiety disorder. *Behaviour Research and Therapy* 2005;43:1281–1310. [PubMed: 16086981]
- 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]
- Moscovitch DA, Hofmann SG. When ambiguity hurts: Social standards moderate self-appraisals in generalized social phobia. *Behaviour Research and Therapy* 2006;45:1039–1052. [PubMed: 16962994]
- Roemer L, Orsillo SM. Expanding our conceptualization of and treatment for generalized anxiety disorder: Integrating mindfulness/acceptance-based approaches with existing cognitive-behavioral models. *Clinical Psychology: Science and Practice* 2002;9:54–68.
- Roemer L, Orsillo SM. An open trial of an acceptance-based behavior therapy for generalized anxiety disorder. *Behavior Therapy* 2007;38:72–85. [PubMed: 17292696]
- Roemer, L.; Orsillo, SM.; Barlow, DH. Generalized anxiety disorder. In: Barlow, DH., editor. *Anxiety and Its Disorders*. 2nd ed.. Guilford; New York: 2002. p. 477-515.
- Roemer L, Orsillo SM, Salters-Pedneault K. Efficacy of an acceptance-based behavior therapy for generalized anxiety disorder: Evaluation in a randomized controlled trial. *Journal of Consulting and Clinical Psychology*. In press.
- Roemer L, Salters K, Raffa S, Orsillo SM. Fear and avoidance of internal experiences in GAD: Preliminary tests of a conceptual model. *Cognitive Therapy and Research* 2005;29:71–88.
- Ruscio AM, Borkovec TD. Experience and appraisal of worry among high worriers with and without generalized anxiety disorder. *Behavior Research and Therapy* 2004;42:1469–1482.
- Tabachnick, BG.; Fidell, LS. Using multivariate statistics. 4th ed.. Allyn & Bacon; Boston, MA: 2001.
- Wells A. Meta-cognition and worry: A cognitive model of generalized anxiety disorder. *Behavioural and Cognitive Psychotherapy* 1995;23:301–320.
- Williams KE, Chambless DL, Ahrens A. Are emotions frightening? An extension of the fear of fear construct. *Behaviour Research and Therapy* 1997;35:239–248. [PubMed: 9125104]
- Wilson, KG.; Murrell, AR. Values work in Acceptance and Commitment Therapy: Setting a course for behavioral treatment. In: Hayes, SC.; Follette, VM.; Linehan, M., editors. *Mindfulness & Acceptance: Expanding the cognitive-behavioral tradition*. Guilford; New York: 2004. p. 120-151.
- Zvolensky, MJ.; Feldner, MT.; Leen-Feldner, EW.; Yartz, AR. Exploring basic processes underlying acceptance and mindfulness. In: Orsillo, SM.; Roemer, L., editors. *Acceptance and Mindfulness-based Approaches to Anxiety: Conceptualization and treatment*. Springer; New York: 2005. p. 325-357.

Table 1
Means, standard deviations, alphas and intercorrelations between study variables for all participants

Factor	GAD Group (n = 33)		Non-GAD Group (n = 33)		1	2	3	4	5	6	7	8	
	M (SD)	Range	M (SD)	Range									α
1. AAQ	76.51 (10.62)	49-92	45.67 (8.44)	26-65	.91	---	.89**	.76**	.62**	.69**	.87**	.87**	.67**
2. ACS-ANX	4.70 (.83)	3.15-6.15	2.13 (.65)	1-3.69	1-	.96	---	.79**	.66**	.76**	.84**	.86**	.62**
3. ACS-DEP	3.84 (1.02)	2.25-6.13	1.94 (.76)	1-4.25	1-	.93	---	---	.60**	.67**	.69**	.75**	.71**
4. ACS-POS	3.11 (.88)	1.38-5.54	2.25 (.64)	1-3.85	1-	.88	---	---	.75**	.57**	.50**	.50**	.46**
5. ACS-ANG	3.72 (1.01)	1.88-5.88	2.49 (.66)	1.13-4.13	1-	.83	---	---	.73**	.64**	.64**	.48**	---
6. IUS	80.29 (20.42)	44-118	43.44 (12.22)	27-72	27-	.97	---	---	---	---	.86**	.86**	.62**
7. PSWQ	68.28 (7.41)	47-80	31.45 (10.61)	16-57	16-	.97	---	---	---	---	---	---	.67**
8. DASS-DEP	14.67 (9.90)	2-42	1.58 (2.95)	0-14	0-14	.93	---	---	---	---	---	---	---

Note. AAQ = Acceptance and Action Questionnaire; ACS-ANX = Affective Control Scale - Anxiety subscale; ACS-DEP = Affective Control Scale - Depression subscale; ACS-POS = Affective Control Scale - Positive Affect subscale; ACS-ANG = Affective Control Scale - Anger subscale; IUS = Intolerance of Uncertainty Scale (untransformed value); PSWQ = Penn State Worry Questionnaire; DASS-DEP = Depression Anxiety Stress Scales - Depression subscale.

**
p < .01.

Table 2

Zero-order correlations and partial correlations controlling for depression for measures of experiential avoidance, distress about emotions, intolerance of uncertainty, and worry for the GAD group (n = 33)

Measure	IUS		PSWQ	
	<i>r</i>	partial <i>r</i>	<i>r</i>	partial <i>r</i>
1. AAQ	.67**	.65**	.40*	.36*
2. ACS-ANX	.71**	.72**	.36*	.37*
3. ACS-DEP	.16	.07	.16	.05
4. ACS-POS	.41*	.39*	.08	.04
5. ACS-ANG ^a	.53**	.48**	.25	.16

Note. Correlation table represents partial correlations for the GAD group while controlling for self-reported depression. AAQ = Acceptance and Action Questionnaire; ACS-ANX = Affective Control Scale - Anxiety subscale; ACS-DEP = Affective Control Scale - Depression subscale; ACS-POS = Affective Control Scale - Positive Affect subscale; ACS-ANG = Affective Control Scale - Anger subscale; IUS = Intolerance of Uncertainty Scale; PSWQ = Penn State Worry Questionnaire.

^a partial correlations controlling for depression and gender.

* $p < .05$.

** $p < .01$.