Mechanisms of change in acceptance and commitment therapy: the role of self-compassion, mindfulness, and anxiety sensitivity in simple and multiple mediation

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MECHANISMS OF CHANGE IN ACCEPTANCE AND COMMITMENT THERAPY:  
THE ROLE OF SELF-COMPASSION, MINDFULNESS, AND ANXIETY SENSITIVITY IN SIMPLE AND MULTIPLE MEDIATION

by

Amanda R. Russo

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MECHANISMS OF CHANGE IN ACCEPTANCE AND COMMITMENT THERAPY:
THE ROLE OF SELF-COMPASSION, MINDFULNESS, AND ANXIETY
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Abstract

Much of psychotherapy research over the past few decades has focused explicitly on outcomes and neglected examining mediators or mechanisms of change. Not surprisingly, an abundance of outcome research focuses on Acceptance and Commitment Therapy (ACT). Nevertheless, very few studies have examined ACT processes in formal mediation analyses. Three potential mediators of outcomes in ACT include self-compassion, mindfulness, and anxiety sensitivity. The current experiment extends an original evaluation of the effectiveness of two self-help workbooks (traditional Cognitive Behavioral Therapy—CBT—and ACT) for the treatment of anxious suffering in a randomized clinical trial, examining potential simple and multiple mediators responsible for the change in posttraumatic stress disorder- (PTSD) and depression-related symptoms. Participants included an online sample of individuals who self-reported suffering from anxiety. Participants \((n = 208)\) were randomized to one of the two treatment groups and instructed to work through (with no therapeutic guidance) their respective workbooks over the three-month treatment period. Only participants who completed both the pre- and post-treatment assessment batteries \((n = 67)\) were included in the mediation analyses. Each of the three processes (self-compassion, mindfulness, and anxiety sensitivity) singly (simple mediation) mediated the relation between treatment group (CBT or ACT workbook condition) and outcomes (PTSD- and depression-related symptoms). For both PTSD- and depression-related symptoms, the group of mediators as a whole (multiple mediation) mediated the relation between treatment group and outcome. The ACT workbook condition led to better outcomes via the proposed mediators in both the simple and multiple mediation models. In the multiple mediation
model of PTSD-related symptoms, anxiety sensitivity emerged as a specific indirect effect, whereas in the multiple mediation model of depression-related symptoms, self-compassion (most important) and anxiety sensitivity (second most important) emerged as specific indirect effects. Self-compassion, mindfulness, and anxiety sensitivity appear to be important mediators of the ACT workbook relative to the CBT workbook. In particular, anxiety sensitivity and self-compassion appear to hold special importance among processes presented in the ACT workbook.
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Introduction

The majority of psychotherapy treatment research over the past few decades has focused heavily on outcomes (e.g., depression, anxiety) in randomized clinical trials, which has provided the psychological community with important information regarding the effectiveness of various interventions (Nathan & Gorman, 2002). Nevertheless, to date there exists very little process research to explain how and why these treatments are effective. In fact, only recently has process research received increased attention. In particular, an abundance of research has been conducted on the effectiveness of Acceptance and Commitment Therapy (ACT) for a wide range of psychopathology, yet formal mediation analyses with potential ACT mechanisms are more limited.

To evaluate how change occurs, researchers often look at mediators and mechanisms. Mediators are constructs that show statistical relations between interventions and outcomes (Kazdin, 2007). In other words, a mediator accounts for the relation between the predictor and the criterion (Baron & Kenny, 1986). Mechanisms, on the other hand, explain more precisely the steps through which an intervention leads to an outcome (Kazdin, 2007). Despite only recently becoming more widely studied, it is important for researchers to examine mediators and mechanisms for a variety of reasons. For example, there are an exorbitant number of treatments in use and most likely they produce change for similar reasons. Therefore, understanding the mechanisms of change can allow researchers to determine which treatment components are active, use them as central intervention targets, and optimize therapeutic change (Kazdin, 2007).

The current study proposes, via simple and multiple mediation, to examine processes potentially responsible for improvements in PTSD- and depression-related
symptoms after a three month self-help treatment period. In the original comparative
effectiveness trial (Russo, Earleywine, & Forsyth, manuscript in preparation), all assessed
outcomes improved significantly from pre- to post-treatment, regardless of workbook
condition (ACT or CBT), demonstrating the effectiveness of both workbooks. However,
the limitations of that study included that no formal mediation analyses were conducted.
In other words, it is unknown why and how participants improved from pre- to post-
treatment. The current study will examine potential simple and multiple mediators for
the ACT workbook, as there existed significant between group differences for PTSD- and
depression-related symptoms. The ACT workbook condition outperformed the CBT
workbook condition for both of these outcomes.

**Literature Review**

**Acceptance and Commitment Therapy (ACT)**

Acceptance and Commitment Therapy (ACT), a newer version of CBT, has
received empirical support as a therapist led treatment for a wide range of behavioral
disorders (see Hayes, Luoma, Bond, Masuda, & Lillis, 2006; Öst, 2008; Ruiz, 2010),
including anxiety disorders (Dalrymple & Herbert, 2007; Forman, Herbert, Moitra,
Yeomans, & Geller, 2007; Roemer, Orsillo, & Salters-Pedneault, 2008; Twohig, Hayes,
& Masuda, 2006; Twohig & Whittall, 2009), with such changes often being mediated by
ACT processes (e.g., defusion, psychological flexibility). ACT is one of a growing
number of newer third-generation behavior therapies, which seeks to balance mindfulness
and acceptance processes with commitment and behavior change processes (Hayes,
Strosahl, & Wilson, 1999). As an approach, ACT is part of the CBT family of therapies,
particularly regarding its commitment to pragmatism, evidence-based practice, learning
principles, and direct behavior change technologies (Hayes, 2004, 2008). ACT also differs from CBT in a number of ways.

ACT emerged from a post-Skinnerian account of language and cognition known as Relational Frame Theory (RFT; see Hayes, Barnes-Holmes, & Roche, 2001). This account suggests that cognition is fundamentally built on a basic process of relating events relationally. This process of relating is itself operant behavior and yields products that we normally think of as cognition and language. RFT has helped to explain how and why normal language processes can be both helpful and at the same time self-defeating. As relational processes expand to involve painful private events, human beings will tend to act to avoid, minimize, or get away from them, even when doing so is not useful or helpful.

ACT also differs from mainstream CBTs in terms of its treatment targets. Most CBTs emphasize changing the form, frequency, or intensity of problematic or difficult private events (i.e., thoughts and feelings). ACT, by contrast, focuses on changing a client’s relationship with private experiences, not necessarily the presence or form of those experiences. Using metaphors, experiential exercises, and mindful-acceptance strategies, ACT teaches skills that allow clients to acknowledge their history and what the situation may afford, and to persist in actions that are in the service of their values.

ACT is based on the radically different assumptions about psychological health and what is needed to alleviate human suffering. At the core, ACT flows from the very simple idea that psychological pain and discomfort are both ubiquitous and inevitable facets of life, and thus cannot be completely avoided or eliminated. Yet, people do struggle to change, control, minimize, or avoid painful private events (e.g., thoughts,
feelings, and memories), and this struggle is greatly supported by culture and the mainstream psychological community. Thus, private events, particularly when they are painful, are seen as barriers to life lived well.

Thus, ACT attempts to undermine this struggle and control agenda itself by teaching people how to live with painful aspects of their histories and unpleasant emotional experiences and live in the service of their values. Because ACT is more interested in acceptance and commitment to values, as opposed to symptom alleviation, it has led to an expanded view of treatment targets and acceptable outcomes in therapy.

**ACT intervention targets and psychological inflexibility.** Psychological inflexibility is established and maintained by six interrelated core processes: cognitive fusion, attachment to the conceptualized self, experiential avoidance, disconnection from the present moment, unclear values, and inaction with respect to values. The top portion of Figure 1 illustrates each of the six ACT processes that are thought to contribute to pathology, and on the bottom lies each of the six corresponding ACT intervention targets (Luoma, Hayes, & Walser, 2007). While a detailed description of the six processes and their intervention targets is beyond the scope of this paper, a brief synopsis of each process and its associated intervention target is presented in Table 1.

There is a growing body of research supporting each of the six components of the ACT model of psychopathology and behavior change. Overall, researchers have found that the use of ACT intervention targets (defusion, acceptance, the present moment, self-as-context, values, and committed action) results in lower reported distress (e.g., Gutiérrez, Luciano, Rodríguez, & Fink, 2004), increased task persistence (e.g., Páez-Blarrina et al., 2008), and increased willingness to engage in difficult tasks (e.g., Levitt,
Brown, Orsillo, & Barlow, 2004). The behavior change components have specifically been examined in studies which have found methods within ACT to be helpful (e.g., acceptance), compared to methods without ACT elements (e.g., control; Eifert & Heffner, 2003; Levitt et al., 2004). Furthermore, mediation studies to date have yielded consistent results in favor of ACT process components (e.g. acceptance, psychological flexibility) across a wide range of problems (e.g., mathematic anxiety, anxiety and depression, work-related stress, diabetes self-management) when measured prior to and concurrently with outcomes (Flaxman & Bond, 2010; Gregg, Callaghan, Hayes, & Glenn-Lawson, 2007; Hayes et al., 2006). In addition, Lundgren, Dahl, and Hayes (2008) provide support for ACT processes in multiple mediator models for the treatment of epilepsy.

**CBT-ACT Debate**

There exists an ongoing debate regarding ACT’s existence as a separate therapy than CBT or rather as part of the larger family of CBT. Many researchers view ACT and CBT as more similar than distinct (Arch & Craske, 2008; Hofmann & Asmundson, 2008). For example, Arch and Craske (2008) state that both cognitive restructuring and cognitive defusion may serve to reduce experiential avoidance. Additionally, CBT may inherently contain elements of acceptance (e.g., emotional processing therapy). Paradoxically an acceptance stance to managing anxiety may lead to increased perceptions of control (Arch & Craske, 2008). Furthermore, although different in their endorsement of valued living versus symptom reduction, it seems likely that both therapies facilitate living a fulfilling life (Arch & Craske, 2008).

Only six studies have directly compared CBT and ACT processes of change (Block, 2002; Branstetter, Wilson, Hildebrandt, & Mutch, 2004; Forman et al., 2007;
Lappalainen et al., 2007; Zettle & Hayes, 1986; Zettle & Rains, 1989), all of which suggest that traditional CBT and ACT may impact change processes distinctly, and that ACT may outperform CBT on outcomes (Hayes et al., 2006).

Furthermore, mediation research conducted on ACT and CBT for anxiety disorders is limited. To the best of our knowledge, only three published, peer-reviewed ACT treatment studies (Bond & Bunce, 2000; Forman et al., 2007; Zettle, 2003) have attempted to answer questions regarding mechanisms of change, yet failed to produce true, formal mediation analyses (Arch & Craske, 2008). Despite this fact, each of the studies’ findings provide promising results for ACT process variables, including acceptance and mindfulness, for varied problems such as math, test, and trait anxiety (Zettle, 2003), anxiety and depression (Forman et al., 2007), and work-related stress (Bond & Bunce, 2000). Similarly, Kashdan, Barrios, Forsyth, and Steger (2006) suggest the importance of experiential avoidance in mediating the effects of emotional response styles on anxiety-related distress. Specifically in their study, cognitive reappraisal (a primary process of traditional CBT) was much less predictive than experiential avoidance (a primary process of ACT) of quality of psychological experiences in everyday life.

Likewise, Russo et al. (manuscript in preparation) attempted to answer questions regarding mechanisms of two self-help workbooks for the treatment of anxiety (one based in ACT and the other based in traditional CBT). Russo et al. (manuscript in preparation) conducted a randomized clinical trial examining the effectiveness of these two self-help workbooks: *The Mindfulness and Acceptance Workbook for Anxiety* (ACT workbook; Forsyth & Eifert, 2007) and *The Cognitive Behavioral Workbook for Anxiety* (traditional CBT workbook; Knaus, 2008). Participants were randomized to one of the
two workbooks and engaged in unguided self-help for a period of 12 weeks. Results revealed that regardless of treatment condition, participants significantly improved on both outcome and process measures from pre- to post-treatment. Interestingly, on two of the outcome measures (posttraumatic stress disorder- (PTSD) and depression-related symptoms) participants in the ACT workbook condition significantly outperformed those in the CBT workbook condition, although it is unclear why given the lack of formal mediation analyses conducted.

Proposed Mediators

Self-compassion and mindfulness. There exists substantial research to date examining certain process variables associated with ACT, such as experiential avoidance. However, there exists much less research examining a variety of other potentially important variables, including self-compassion and mindfulness. Self-compassion has been defined as by Neff (2003a) as involving “being touched by and open to one’s own suffering, not avoiding or disconnecting from it, generating the desire to alleviate one’s suffering and to heal oneself with kindness. Self-compassion also involves offering nonjudgmental understanding to one’s pain, inadequacies and failures, so that one’s experience is seen as part of the larger human experience” (Neff, 2003a, p. 87). In other words, self-compassion consists of three basic components: self-kindness, common humanity, and mindfulness (Neff, 2003a).

There is some conceptual overlap between the constructs of mindfulness and self-compassion, in that both involve an attitude of nonjudgment toward one’s experiences (Keng, Smoski, Robins, Ekblad, & Brantley, 2012). Mindfulness can be described as “a form of nonjudgmental, nonreactive attention to experiences occurring in the present
moment, including cognitions, emotions, and bodily sensations as well as sights, sounds, smells, and other environmental stimuli” (Baer, 2009, p. 15). Baer (2009) goes on to write that, “Mindfulness involves close observation of all experiences that arise, with an attitude of acceptance, openness, and willingness and without impulsive attempts to change or escape them, even if they are unpleasant or unwanted” (p. 15). Six scales for measuring mindfulness have been developed including the Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003), the Freiburg Mindfulness Inventory (FMI; Buchheld, Grossman, & Walach, 2001), the Kentucky Inventory of Mindfulness Skills (KIMS; Baer, Smith, & Allen, 2004), the Cognitive and Affective Mindfulness Scale (CAMS; Hayes & Feldman, 2004), The Mindfulness Questionnaire (MQ; Chadwick, Hember, Mead, Lilley, & Dagnan, 2005), and the Five Facet Mindfulness Questionnaire (FFMQ; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006), which appear to measure different constructs of what we call “mindfulness” (Rosch, 2007).

Although limited compared to other ACT-related processes (e.g., experiential avoidance), there does exist empirical support for both self-compassion and mindfulness as important mediators and predictors of outcomes. For example, Thompson and Waltz (2008) explored the relationship between self-compassion and posttraumatic stress symptoms in a sample of introductory psychology students. Results demonstrated that avoidance symptoms significantly correlated with self-compassion, but reexperiencing and hyperarousal symptoms did not, suggesting trauma survivors, and particularly those with PTSD-related symptoms, may benefit from incorporating self-compassion elements into their treatment. In another study, Van Dam, Sheppard, Forsyth, and Earleywine (2011) compared self-compassion (as measured by the Self-Compassion Scale-SCS;
Neff, 2003b) and mindfulness (as measured by the MAAS; Brown & Ryan, 2003) for their ability to predict anxiety, depression, worry, and quality of life in a large community sample seeking self-help for anxious suffering. Results demonstrated self-compassion to be a more robust predictor of depressive and anxious symptoms, as well as quality of life, than mindfulness. In particular, their analyses revealed the self-judgment and isolation subscales of the SCS to be especially important in predictive value, and that the mindfulness subscale of the SCS may measure a different construct from that of the MAAS (Van Dam et al., 2011). Likewise, Keng et al. (2012) examined mindfulness (as measured by the FFMQ; Baer et al., 2006) and self-compassion (as measured by the SCS; Neff, 2003b) as potential mediators of Mindfulness-Based Stress Reduction (MBSR) in a randomized trial of MBSR versus waitlist in a nonclinical sample (mean age was 46 years). Results revealed that changes in mindfulness independently mediated the effects of MBSR on difficulties in emotion regulation, controlling for changes in self-compassion. Additionally, self-compassion mediated the effects of MBSR on worry, controlling for changes in mindfulness. Lastly, both mindfulness and self-compassion mediated the effects of MBSR on fear of emotion (Keng et al., 2012). Finally, in a study conducted by Kuyken et al. (2010), the mechanisms of Mindfulness Based Cognitive Therapy (MBCT) were examined in a randomized controlled trial of recurrently depressed patients. It was found that the effects of MBCT on depressive symptoms were mediated by changes in both mindfulness (as measured by the KIMS; Baer et al., 2004) and self-compassion (as measured by the SCS; Neff, 2003b) (Kuyken et al., 2010).

There have also been studies solely examining mindfulness a potential mediator of outcomes. For example, Nyklicek and Kuijpers (2008) examined the effects of
mindfulness, as measured by the MAAS (Brown & Ryan, 2003) and two subscales of the KIMS (Baer et al., 2004), as a mediator in MBSR compared to a waiting list control condition in a randomized controlled trial among a sample of community participants with symptoms of distress. Support was found for at least a partial mediation effect by mindfulness; general mindfulness was found to be a mediator for perceived stress, quality of life, and partially on vital exhaustion (Nyklicek & Kuijpers, 2008). In another study conducted by Thompson and Waltz (2010), it was found that among a sample of introductory psychology students, mindfulness and experiential avoidance together significantly contributed to predicting the variance in PTSD symptom severity above and beyond experiential avoidance alone. Of particular note was that the nonjudgment subscale of the mindfulness scale used (FFMQ; Baer et al., 2006) accounted for a unique portion of the variance in PTSD avoidance symptoms (Thompson & Waltz, 2010).

Moreover, in a sample of veterans who participated in a VA MBSR course offering, enhanced mindfulness skills mediated the relationship between participation in MBSR and improvement in measures of PTSD, depression, and quality of life (Kearney, McDermott, Malte, Martinez, & Simpson, 2012). Finally, mindfulness has also been shown as a mediator of the relationship between disordered eating-related cognitions and psychological distress (Masuda & Wendell, 2010), as well as between an eight-week mindfulness training course and perceived stress, posttraumatic avoidance symptoms, and positive states of mind among cancer patients (Bränström, Kvillemo, Brandberg, & Moskowitz, 2010).

**Anxiety sensitivity.** Anxiety sensitivity (AS) can be defined as the tendency to fear bodily symptoms associated with anxious arousal (e.g., increased heart rate,
shortness of breath) due to beliefs that the sensations will be harmful in some way (e.g., negative consequences) (Reiss, 1991). Historically anxiety sensitivity has been viewed in relation to panic disorder, with studies showing high levels of anxiety sensitivity among individuals with panic disorder (Cox, Borger, & Enns, 1999). Additionally, higher levels of anxiety sensitivity have been found among individuals with major depression (Tull & Gratz, 2008). In particular, studies have shown that a specific dimension of anxiety sensitivity, fear of cognitive dyscontrol, is associated with more severe depression (Cox, Borger et al., 1999; Cox, Taylor, & Enns, 1999). Thus, anxiety sensitivity has been examined as both a predicting and mediating variable. For the purposes of the current paper, the literature examining anxiety sensitivity as a mediator, and specifically in relation to PTSD- and depression-related symptoms, will be focused upon. For example, in a study conducted by Jakupcak et al. (2006), it was found that among male veterans seeking inpatient treatment for PTSD, anxiety sensitivity and depression severity accounted for the relationship between PTSD and somatic complaints, suggesting that anxiety sensitivity and depression may represent mechanisms that account for the relationship between PTSD and somatic complaints. In another study, Ho et al. (2011) found that among Chinese university students, higher levels of anxiety sensitivity mediated the relationship between higher levels of neuroticism and anxious symptoms, as well as between higher levels of neuroticism and higher levels of general distress symptoms. Anxiety sensitivity, however, did not mediate the relationship between higher levels of neuroticism and depressive symptoms (Ho et al., 2011). Finally, in a study of sixth and seventh graders in New Orleans five to eight months following Hurricane Katrina, it was found that anxiety sensitivity explained 6% more variance in PTSD
symptoms than exposure and trait anxiety (Hensley & Varela, 2008). In particular, through using the Children’s Anxiety Sensitivity Index (CASI; Silverman, Fleisig, Rabian, & Peterson, 1991) it was found that the social concerns, unsteady concerns, and disease concerns subscales uniquely explained PTSD symptoms (Hensley & Varela, 2008). While no formal mediation analyses were conducted, the results demonstrated important relationships with anxiety sensitivity, including moderation analyses. It was found that anxiety sensitivity social concerns moderated the relationship between trait anxiety and PTSD symptoms. Likewise, anxiety sensitivity social concerns moderated the relationship between trait anxiety and somatic symptoms (Hensley & Varela, 2008).

Internet-Based Treatment Engagement

Research on Internet-based treatments is rapidly growing, and a number of studies have demonstrated that Internet-based treatments are effective for a wide range of psychopathology (Melville, Casey, & Kavanagh, 2010; Strom, 2003). Often Internet-based interventions take the form of web-based treatment programs delivered by structured web pages that participants work through with varying levels of independence (Melville et al., 2010). Despite its demonstrated effectiveness, Internet-based treatment has also displayed high participant dropout rates, with varying definitions of dropout. Most commonly, dropout can be defined as non-completion of one or more assessment or treatment components (Melville et al., 2010). Understanding participant dropout is critical in the creation of successful web-based interventions that keep participants involved through all treatment and assessment phases, including follow-up.

In a recent review of minimal therapist contact (meaning some minor contact with a therapist) Internet-based interventions for psychological disorders, it was found that
among nineteen studies that met inclusion criteria, dropout rates ranged from 2 to 83% with a weighted average of 31% (Melville et al., 2010). Dropout also varied, among ten studies, according to when it occurred during the treatment process. Dropouts occurring prior to beginning treatment ranged from 4 to 52% (with a weighted average of 21%), dropouts during treatment ranged from 0 to 78% (with a weighted average of 21%), and dropouts during follow-up periods ranged from 0 to 18% (with a weighted average of 8%) (Melville et al., 2010). Thirteen studies reported on variables associated with dropout. Three broad categories of predictors were identified (socio-demographic and contextual variables, psychological problems, and treatment-related variables), yet produced primarily nonsignificant and inconclusive results (Melville et al., 2010).

Similar to the uncertainty regarding the aforementioned predictors of participant dropout, there is also mixed research regarding the importance of financial incentives. Older research has not supported that financial incentives increase response rates (Church, 1993; Hopkins & Gullickson, 1993). Likewise, some studies have showed that donations to charity and lotteries do not affect response rates (e.g., Hubbard & Little, 1988; O’Neil & Penrod, 2001; Roberts, Roberts, Sibbald, & Torgerson, 2000). Other studies, however, have supported that using financial incentives in Internet-based studies decreases dropout rates (e.g., 45% versus 14%, Musch & Reips, 2000; by 10.4%, O’Neil, Penrod, & Bornstein, 2003). Likewise, Frick, Bächtiger, and Reips (1999) found that offering a lottery resulted in reduced dropout; dropout was twice as large in the non-lottery information condition compared to the lottery information condition (18.5% versus 9.5%). According to Frick et al. (1999), it is also important to note that overall dropout in their study was low, suggesting that with a proper design, even a study with no
financial incentives can achieve a low dropout rate. O’Neil and Penrod (2001) acknowledged that their results conflicted with Frick et al. (1999), and offered the length of their study as an important difference. Perhaps shorter assessments (e.g., Frick et al., 1999) require less monetary compensation than lengthier, more reading intensive assessments (O’Neil & Penrod, 2001). In both of the aforementioned studies the financial incentives were roughly equivalent (Frick et al., 1999; O’Neil & Penrod, 2001). Finally, two meta-analyses reviewed the effectiveness of material incentives (primarily nonmonetary) in Internet-based studies and found that they promote increased responding and decreased dropout rates (Göritz, 2006). Therefore, researchers can still seemingly benefit from using incentives, even without a high study budget.

Another important issue to be examined regarding participant dropout in future studies is privacy concerns. Research shows that being asked to provide personal information at the beginning of a study may negatively influence dropout temporarily, but ultimately reduces dropout rates (Frick et al., 1999; O’Neil & Penrod, 2001). In addition to privacy concerns, O’Neil et al. (2003) found that using undergraduates and nonstudents (and offering financial incentives to nonstudents) reduced dropout rates. Finally, O’Neil et al. (2003) also revealed important issues in reducing dropout which warrant future investigation, such as subject matter, organization of tables, and combining several variables in order to achieve greater effects.

**The Present Study**

To the best of our knowledge, to date there have been no studies examining all three of the proposed mediators described (self-compassion, mindfulness, and anxiety sensitivity) in both single and multiple mediation models for PTSD- and depression-
related symptoms. The central aim of the present study was to examine the relations between treatment group (CBT or ACT workbook condition) and outcomes (PTSD- and depression-related symptoms), separately. In particular, we examined three process variables previously associated with the ACT workbook (Russo et al., manuscript in preparation): self-compassion (as measured by the Self-Compassion Scale), mindfulness (as measured by the Mindful Attention Awareness Scale), and anxiety sensitivity (as measured by the Anxiety Sensitivity Index) in both simple and multiple mediation models. The current study examined a few hypotheses: (a) treatment group is related to PTSD- and depression-related symptoms in participants who have self-reported anxiety problems; (b) self-compassion, mindfulness, and anxiety sensitivity mediate, separately, the relation between treatment group and PTSD-related symptoms; (c) self-compassion, mindfulness, and anxiety sensitivity mediate, together as a group, the relation between treatment group and PTSD-related symptoms; (d) self-compassion, mindfulness, and anxiety sensitivity mediate, separately, the relation between treatment group and depression-related symptoms; (e) self-compassion, mindfulness, and anxiety sensitivity mediate, together as a group, the relation between treatment group and depression-related symptoms; (f) the ACT workbook leads to better outcomes via each of the proposed mediators separately (and together as a group of mediators) than does the CBT workbook.

**Methods**

**Participants and Recruitment of Original Study**

Our intent was to reach a large international community sample of individuals suffering from anxiety disorders. To accomplish such aims, we established a study
website and undertook an aggressive email and web-based dissemination campaign to promote the study and direct traffic to the study website. Participants were recruited via online advertisements posted on websites offering support for individuals struggling with anxiety-related concerns. The online advertisements directed possible participants to a website where the study was described. The website outlined the purpose of the study, which was said to examine the effectiveness of two self-help workbooks for individuals suffering from anxiety. The website provided information about assessments, incentives for participation, the research team, ethical issues, and sign-up procedures. The website also offered links to various educational sites describing CBT, ACT, anxiety and its disorders, and referrals for additional help. Participants were informed that they would be randomly assigned to read either *The Cognitive Behavioral Workbook for Anxiety* (Knaus, 2008) or *The Mindfulness and Acceptance Workbook for Anxiety* (Forsyth & Eifert, 2007).

To be eligible, participants had to be at least 18 years of age, with access to the internet, and have self-reported proficiency in reading English (eighth grade or higher). In addition, participants were required to provide a positive endorsement of one of the following four questions, “Do you believe that anxiety is a problem for you?”, “Does your anxiety and fear interfere with your life and what you want to do?”, “Do you find yourself consumed with concerns about anxiety and how to control it?”, and “Do you see your anxieties, fears, and worries as barriers to the life you want to lead?”. Participants were excluded if they indicated suicidal or homicidal ideation or intent, or responded positively to our question regarding prior exposure to, or use of, either of the two workbooks under investigation. There were no other exclusionary criteria. The study
was approved by the University at Albany, State University of New York, Institutional Review Board, and all participants provided electronic informed consent prior to participation.

Approximately 208 individuals (157 females; \( \text{Mage} = 37.45 \), range 18-71) met eligibility criteria for the study and consented to participate. As can be seen in Table 2, the majority of the sample was Caucasian (84.6%) and seventy-six percent reported residing in the United States, followed by Canada, Australia, and the United Kingdom. Additionally, approximately 57.3% of the sample reported having received a previous diagnosis of an anxiety disorder, and 10.6% of the sample a diagnosis of a mood disorder (i.e., major depression or dysthymia). Thirteen percent of participants did not provide information about their diagnostic history and 19.2% reported never having been diagnosed with an anxiety-related disorder. The sample appeared highly educated (i.e., 85.4% reporting some college or advanced degree work), with most also being married or single (84.1%; see Table 2). Interestingly, approximately 41% of the sample reported currently receiving mental health treatment for psychological difficulties and approximately 50% reported currently taking medication for psychological difficulties.

**Workbooks**

Two self-help workbooks used in the present study are described below. Both New Harbinger publications are roughly equivalent in length, reading level, and focused on a transdiagnostic approach to treat a range of anxiety-related problems, rather than specific anxiety disorders.

*The Cognitive Behavioral Workbook for Anxiety* (Knaus, 2008) consists of 18 chapters divided into two major parts. Part I is designed to help the reader develop
greater perspective about fears and anxiety, to set goals, and to begin basic techniques for changing irrational beliefs, such as identifying anxiety self-talk and substituting challenges for threats. It provides brief psychoeducation on anxiety and fear as well as cognitive, emotional, and behavioral interventions used to treat them. Part II provides more advanced cognitive behavioral techniques to help the reader change and eliminate his negative cognitions, including a focus on techniques used within Rational Emotive Behavior Therapy (REBT; David, Szentagotai, Eva, & Macavei, 2005). At its core, REBT posits that the beliefs individuals hold, rather than actual life events, cause them to become anxious and depressed (Ellis, 1958, 1962, 2002; Padesky & Beck, 2003). Thus, a significant portion of the book emphasized techniques and strategies to identify and change irrational beliefs. Part II also focuses on building and sustaining emotional tolerance, and includes information and exercises to break procrastination-fear connections, controlling worry and fear, and defeating panic. While the book does not mention exposure explicitly, it provides behavioral methods in order to alleviate fear and change negative cognitions and behaviors. The book does address depression in the context of anxiety-related concerns, although depression is not explicitly targeted. The book encourages mastery and control of anxiety and fear-related symptoms, and discusses acceptance only briefly to illustrate that one cannot control every aspect of his life and to encourage acknowledgment of these situations. The workbook includes numerous exercises and worksheets.

*The Mindfulness and Acceptance Workbook for Anxiety* (Forsyth & Eifert, 2007) covers the application of ACT for all anxiety disorders and consists of 19 chapters divided into three main parts. Part I includes psychoeducation about each anxiety
disorder and related concerns (e.g., depression, substance abuse), outlines myths about anxiety (e.g., anxiety is abnormal or a sign of weakness), and covers the consequences of anxiety management, avoidance, and control. Part II addresses the short and long-term costs and benefits associated with struggle and avoidance (e.g., damaged or lost relationships, career problems, negative health effects, and decreased energy) and introduces mindful acceptance of anxiety and fear as an alternative to control-based strategies that have not worked in the past. Part III guides the reader into values clarification and the barriers that often stand in the way of taking steps in directions that matter. The barriers (i.e., anxious thoughts, feelings, images, physical sensations, and behavioral tendencies) are clarified and the reader is taught how to move with these barriers using a variety of acceptance-based strategies (e.g., mindfulness, defusion, kindness and compassion building exercises). Readers are given concrete guidance on how to apply such strategies to internal and external anxiety-inducing events using exposure-like ACT exercises (e.g., being willingly out of breath). Such willingness exercises capitalize on exposure-based strategies, but differ in that anxiety reduction is not an explicit goal. In fact, symptom reduction is not a goal of the text, and anxiety and depression reduction are not explicit targets. Instead, the focus is acceptance of one’s anxiety and fear (and emotional pain more generally) so as to move forward and make behavioral commitments in the service of valued ends. As with the previously described CBT workbook, depression is not explicitly targeted. The Mindfulness and Acceptance Workbook for Anxiety includes numerous experiential exercises which utilize imagery and metaphor, and these exercises are available on an audio CD that accompanies the book.
Measurement Procedures and Devices

All participants completed a large battery assessment (pre- and post- intervention) that included well-established measures assessing PTSD- and depression-related symptoms, as well as various processes. Assessment measures were delivered online via Survey Monkey (www.surveymonkey.com), with SSL encryption of the links and response pages during transmission. Each participant was assigned a unique Study ID number, which was used to track completion of all study assessments. To date, emerging work supports the utility of online self-report for anxiety-related concerns (e.g., social anxiety, trauma; Hedman et al., 2010; Read, Farrow, Jaanimägi, & Ouimette, 2009). The following measures were both included in the assessment batteries and analyzed in the subsequent simple and multiple mediation analyses.

**Outcome/emotional distress indices.** *Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996).* The BDI-II is a well-established 21-item self-report measure of cognitive, affective, and somatic symptoms of depression. Individual items are scored from 0 to 3, and total scores range from 0 to 63. Clinical cut-off scores have been established to aid in the interpretation of BDI-II scores. For instance, scores ranging from 0 to 9 suggest that a person is not depressed, 10 to 18 suggest mild-to-moderate depressive symptomatology, 19 to 29 suggest moderate-to-severe depressive symptomatology, and 30 to 63 suggest severe depressive symptomatology. The BDI-II has demonstrated excellent internal consistency ($\alpha = .92$ among outpatients; Beck et al., 1996) as well as content and factorial validity (Dozois, Dobson, & Ahnberg, 1998). In the present sample, the internal consistency was equivalent to that seen among outpatients, $\alpha = .92$. 
PTSD Checklist-Civilian (PCL-C; Blanchard, Jones-Alexander, Buckley, & Forneris, 1996; Weathers, Litz, Herman, Huska, & Keane, 1993). The PCL-C is a well-established 17-item self-report measure that assesses PTSD symptom severity not linked to a specific stressful event. Respondents report how much they have been bothered by various PTSD-related symptoms over the past month on a five-point Likert-type scale (1 = not at all to 5 = extremely). The total summated score determines PTSD symptom severity. Cutoff scores have been established to indicate the possibility of PTSD-related symptoms in military (i.e., PCL-C total > 50) and civilian (PCL-C total > 44) samples (Blanchard et al., 1996; Weathers et al., 1993). The PCL-C has excellent internal consistency in veterans, motor vehicle accident survivors, and victims of sexual assault (rs ranging from .94 to .97; Blanchard et al., 1996; Weathers et al., 1993) as well as good construct validity (Weathers et al., 1993). In the present sample, the internal consistency was comparable to published reports, $\alpha = .92$.

Process indices. Self-Compassion Scale (SCS; Neff, 2003b). The SCS is a 26-item self-report measure of self-compassion. Sample statements include “I try to be loving towards myself when I’m feeling emotional pain” and “When I fail at something important to me I become consumed by feelings of inadequacy.” Items are rated on a 5-point Likert type scale (1 = almost never to 5 = almost always), and average total scores range from 1 to 6, with higher scores indicating greater self-compassion. Scores for six subscales may also be computed, however for the purposes of the present study we focused on the overall total SCS score. The SCS has good internal consistency ($\alpha = .77$ to .81) and 3-week test-retest reliability ($r = .91$). Moreover, the scale has demonstrated positive correlations with many measures of emotional well-being, and negative
correlations with various measures of psychopathology (Neff, 2003b). In the present sample, the internal consistency was $\alpha = .94$, equivalent to that found in published reports.

*Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003).* The MAAS is a 15-item self report measure of the attentional component of mindfulness. Sample items include statements such as “I find it difficult to stay focused on what’s happening in the present” and “I rush through activities without being really attentive to them.” Items are rated on a 6-point Likert type scale (1 = *almost always* to 6 = *almost never*) and average total scores range from 1-6, with higher scores indicating more mindfulness. The MAAS has demonstrated good internal consistency ($\alpha = .80$ to .87), 4-week test-retest reliability ($r = .81$), and excellent construct validity (Brown & Ryan, 2003). In the present sample, the internal consistency was comparable to published reports, $\alpha = .88$.

*Anxiety Sensitivity Index (ASI; Peterson & Reiss, 1993; Reiss, Peterson, Gursky, & McNally, 1986).* The ASI is a widely used 16-item self-report measure of fear of anxiety-related symptoms (i.e., fear of fear). Items are rated on a five-point Likert-type scale (0 = *very little* to 4 = *very much*). Possible scores range from 0-64, with greater scores indicating more anxiety sensitivity (AS). The ASI has demonstrated good-to-excellent internal consistency ($\alpha = .82$ to .91) as well as adequate test-retest reliability ($rs = .71$ to .75; Peterson & Reiss, 1993). Moreover, support exists for adequate criterion and construct validity of the ASI (Peterson & Reiss, 1993). In the present sample, the internal consistency was $\alpha = .90$, equivalent to that found in published reports.

In addition, Fetzner, Collimore, Carleton, and Asmundson (2012) found that AS somatic concerns (as measured by the ASI -3—18 items) are the most robust predictor of
variance relative to other AS dimensions within the relationship between AS and PTSD (as measured by the PCL-C). AS cognitive dyscontrol, however, was only a significant predictor of the PCL-C hyperarousal symptom cluster. Finally, the AS fear of socially observable symptoms subscale did not contribute significant variance to the PCL-C total or subscale scores (Fetzner et al., 2012).

In another study conducted by Taylor, Koch, and McNally (1992), it was found that AS (as measured by the ASI) associated with PTSD ($M = 31.6, SD = 12.8$) was nearly as high as that found in panic disorder (PD) ($M = 36.6, SD = 12.3$). ASI item analyses were performed on a sample split into three groups: one of participants suffering from PD, one of participants suffering from PTSD, and one of participants suffering from other anxiety disorders. The PD group scored significantly higher ($p < .05$) than the PTSD group on 7 out of 16 items (e.g., cardiopulmonary symptoms, unusual body sensations, subjective experience of anxiety), but did not differ on items assessing fears of concentration difficulties or trembling. Results showed that the groups were most likely to differ on items that were more central to the construct of AS (Taylor et al., 1992).

**Procedure**

A randomized comparative treatment design was used, with participants randomized to one of two workbook conditions (CBT or ACT). Participants were assessed pre-intervention (baseline) and post-workbook intervention (after 12 weeks with the assigned workbook).

After participants completed an electronic informed consent form and eligibility/demographic questions, research personnel identified participants who were
eligible for participation. All participants were emailed an invitation link to complete the pre-treatment assessment battery. The only incentive participants had for completing the assessment was the promise of a free workbook in the coming weeks.

Following the initial assessment, participants were randomly assigned to one of the two workbook conditions (CBT, N = 105, female = 79; ACT, N = 103, female = 78) using a random number table. The research team remained blind to the identity of participants and their baseline scores at the time of randomization. Participants were then mailed a free paper copy of either *The Cognitive Behavioral Workbook for Anxiety* (CBT workbook; Knaus, 2008) or *The Mindfulness and Acceptance Workbook for Anxiety* (ACT workbook; Forsyth & Eifert, 2007) and were instructed to work with the material in their workbook for a 12 week period. The start time of the 12 week intervention period was set for each new enrollment approximately two weeks after the date of mailing. Participants were instructed to read and complete exercises at their own pace and were provided with a proposed 12-week timeline to assist with their pacing over the 3 month active intervention period.

At the 12 week mark, participants received another email invitation from researchers with a link to complete the post-intervention assessment battery. The battery was identical to the pre-intervention assessment, with the exception of additional questions tapping perceptions of the helpfulness and readability of the workbook, along with psychotherapy and medication use over the trial period. Participants who completed the post-intervention assessment were entered into a lottery drawing for one $25 Amazon gift card. Individuals who failed to complete the post-intervention assessment at the 12-week point received three subsequent email reminders, each spaced one-week apart.
Participants were classified as non-completers when they failed to complete the post-intervention assessment after receiving three follow-up emails. Non-completers then received a final email as well as a paper mailing inquiring about the status of their study participation.

Throughout the trial, participants had no coaching or therapeutic consultation with study personnel. Planned forms of communication between participants and research personnel included email reminders for participants to complete the required assessments. When participants chose to contact research personnel about other issues, all information exchanged related to logistics of study participation and not about questions or concerns with the content of the workbooks. Participants were made aware of two optional online message board forums (one for each treatment condition), each accessible by password, in which they could post messages to other participants. Yet, very few participants used this option judging by the infrequency of posts.

**Data Reduction and Statistical Analyses**

**The original study.** The first series of analyses focused on equivalence between the workbook conditions at pre-treatment, both in terms of demographic variables and primary outcomes. This was followed by univariate analyses of variance (ANOVAs) to examine group equivalence on pre-treatment outcome variables.

Second, to assess the change within and between groups over time, repeated measures analyses of variance (ANOVAs) were conducted on pre- and post-intervention scores for each measure. Given the small sample size of study completers and the exploratory nature of the study, we were more concerned about the possibility of Type II error and therefore chose not to modify significance values (Rothman, 1990). Partial eta
squared statistics were calculated for pre-post within-groups differences and reported as an index of effect size where: small effects = .01, medium effects = .06, and large effects $\geq .14$ (Cohen, 1988). Cohen’s $d$ was computed as an index of effect size for all measures at post-treatment (small effects = .20, medium effects = .50, and large effects $\geq .80$; Cohen, 1977).

**The present study.** In the present study, both simple and multiple mediation analyses were conducted on the sample of 67 treatment completers to assess for the relations between treatment group and outcomes (PTSD- and depression-related symptoms). All mediation analyses were conducted through the use of an SPSS macro (Preacher & Hayes, 2004, 2008). In order to test the total (group of mediators as a whole) and specific (each mediator’s unique ability) indirect effects through multiple mediation, Preacher and Hayes’ Indirect macro (2008) relies upon a non-parametric resampling procedure, known as bootstrapping. Bootstrapping procedures have been recommended over other approaches to mediation analyses given their ability to improve power and model parsimony and reduce the probability of Type I errors (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002; Preacher & Hayes, 2004, 2008). Bootstrapping with five thousand iterations was used in the current study. The cross product of the coefficients (ab path) was used to determine if the indirect effects were significant. The bias corrected and accelerated 95% confidence intervals were then examined. A point estimate was considered significant at the level indicated so long as the confidence intervals did not contain zero (Preacher & Hayes, 2004, 2008).
Results

A series of analyses were initially conducted to determine whether our random assignment procedure was effective in yielding equivalence between the two workbook conditions ($N = 67$; CBT condition = 30; ACT condition = 37) on demographic variables and assessed outcome and process variables. Of the 208 individuals who met eligibility, completed the pre-treatment assessment, and received a workbook, 141 failed to complete the post-intervention assessment. Thus, the primary analyses are restricted to those who completed both assessments.

Evaluation of Group Equivalence at Pre-Treatment

As expected, assessed demographic variables (e.g., diagnosis, education) did not discriminate between groups (all $\chi^2 > .05$). Additionally, the CBT ($M = 40.43$, $SD = 11.89$) and the ACT ($M = 42.62$, $SD = 13.63$) workbook conditions did not differ by age, $t(65) = -.69$, $p > .05$ (Cohen’s $d = -0.171$). Moreover, readiness to change did not reliably discriminate between the CBT ($M = 5.03$, $SD = 3.50$) and the ACT ($M = 5.35$, $SD = 3.31$) workbook conditions, $t(65) = -0.38$, $p > .05$ (Cohen’s $d = -0.093$). Likewise, the CBT ($M = 3.66$, $SD = 2.14$) and ACT ($M = 4.19$, $SD = 1.85$) workbook conditions did not differ at pre-treatment in terms of their current relationship with anxious suffering (e.g., feelings of being stuck with anxiety), $t(64) = -1.09$, $p > .05$ (Cohen’s $d = -.264$).

Our intent was to evaluate the workbooks in a manner consistent with the way in which they were most likely to be used, and inevitably a portion of participants would be concurrently involved in another form of treatment. Given our interest in providing a naturalistic evaluation of self-help, we were explicitly liberal in terms of exclusion criteria, and particularly with regard to current psychotherapy or medication use. We did,
however, assess both domains. Not surprisingly, approximately 30% of participants in
the CBT workbook condition \((n = 9)\) and 46% of the ACT workbook condition \((n = 17)\)
reported seeing a mental health professional for anxiety concurrently with study
participation. In addition, approximately 50% of the CBT workbook condition \((n = 15)\)
and 46% of the ACT workbook condition \((n = 17)\) reported taking medication for anxiety
concurrently with study participation. Yet, the CBT and ACT workbook conditions did
not differ in current psychotherapy \((\chi^2[1] = 1.77, p > .05, OR = .50)\), or with medication
usage \((\chi^2[1] = .11, p > .05, OR=1.18)\). These findings further support the effectiveness
of our randomization procedures, as well as the effectiveness of each book outside of
typical treatment settings.

Additionally, a series of univariate analysis of variance (ANOVAs) were
carried out in order to determine if outcomes (PTSD- and depression-related symptoms)
differed at post-treatment depending upon whether participants were concurrently taking
medication for anxiety and/or were in current psychotherapy. Pre-treatment scores for
each outcome were entered as covariates. Results indicated that concurrent anxiety
medication and/or psychotherapy did not significantly impact PTSD-related symptoms
scores at post-treatment, \(F(1,66) = .491, p = .486, \eta^2 = .008\); and \(F(1,66) = .069, p =
.794, \eta^2 = .001\), respectively. Likewise, no significant differences in depression-related
symptoms were revealed at post-treatment for participants receiving concurrent
medication and/or psychotherapy, \(F(1,66) = .653, p = .422, \eta^2 = .010\); and \(F(1,66) =
.249, p = .620, \eta^2 = .004\), respectively.

Next, a series of univariate analysis of variance (ANOVAs) were conducted in
order to determine if both the CBT and ACT workbook conditions were equivalent at
pre-intervention across the assessed outcome and process domains. Tables 3 and 4 illustrate the means and standard deviations for each of the outcome and process domains assessed, respectively. As expected, none of the outcome or process variables reliably discriminated between workbook conditions prior to treatment.

The Original Study: Post-Treatment Analyses of Outcomes and Processes

For each of the two outcome measures (PCL and BDI) and for each of the proposed mediators (SCS, MAAS, and ASI) a repeated measures analysis of variance (ANOVA) was conducted with group (CBT or ACT workbook condition) serving as the between group factor and time serving as the within group factor with two levels (pre- and post-intervention). Analyses were conducted for participants who completed both the pre- and post-intervention assessment batteries, totaling 67 participants.

Outcomes. As can be seen in Table 3, participants reported moderate-to-severe levels of depressive symptomatology (BDI-II) prior to treatment and this improved significantly over time: $F(1, 66) = 50.71, p < .001, \eta^2 = .44$ (large effect size). Moreover, pre to post-intervention improvements in depressive symptomatology were greater in the ACT workbook condition relative to the CBT workbook condition, as supported by a significant Group x Time interaction, $F(1,66) = 8.71, p = .004$, Cohen’s $d = .61$ (medium-to-large effect at post-treatment). The impact on depression-related symptoms in the ACT workbook condition also appeared meaningful based on existing cut-offs (i.e., movement from moderate-to-severe to mild-to-moderate depression-related symptoms). As can also be seen in Table 3, participants reported high levels of PTSD symptomatology (PCL-C), which improved significantly over time: $F(1, 66) = 41.76, p < .001, \eta^2 = .39$ (large effect size). Moreover, pre-to post-intervention improvements in
PTSD symptomatology were greater in the ACT workbook condition relative to the CBT workbook condition, as supported by a significant Group x Time interaction, $F(1,66) = 5.70, p = .02$, Cohen’s $d = .44$ (small-to-medium effect at post-treatment).

**Processes.** As can be seen in Table 4, participants reported low levels of mindfulness and self-compassion at pre-intervention and scores improved significantly over time: mindfulness (MAAS), $F(1, 66) = 55.39, p < .001, \eta^2 = .46$ (large effect size); and self-compassion (SCS), $F(1, 64) = 36.47, p < .001, \eta^2 = .37$ (large effect size), respectively. Furthermore, pre to post-intervention improvements in both mindfulness and self-compassion were greater in the ACT workbook condition relative to the CBT workbook condition, as supported by significant Group x Time interactions: mindfulness (MAAS), $F(1, 66) = 8.02, p = .006$, Cohen’s $d = .60$ (medium-to-large effect at post-treatment); and self-compassion (SCS), $F(1, 64) = 13.53, p < .001$, Cohen’s $d = .59$ (medium-to-large effect at post-treatment), respectively. As can also be seen in Table 4, participants at pre-treatment reported high levels of anxiety sensitivity (ASI), which improved significantly over time: $F(1, 66) = 80.55, p < .001, \eta^2 = .55$ (large effect size). Moreover, pre to post-intervention improvements in ASI scores were greater in the ACT workbook condition relative to the CBT workbook condition, as supported by a significant Group x Time interaction, $F(1, 66) = 6.36, p = .01$, Cohen’s $d = .56$ (medium effect at post-treatment).

**The Present Study**

**Data cleaning.** Data with skewness of .6 or greater (standard error = .29) were transformed and the square root transformations were included in the analyses below. In
addition, as can be seen in Table 5, correlations among treatment group, outcomes, and proposed mediators were calculated, demonstrating relatedness but not multicollinearity.

**Simple mediation.** The main question under investigation was whether the link between treatment group and reduction in PTSD-related symptoms (and the link between treatment group and reduction in depression-related symptoms) was mediated by self-compassion, mindfulness, and anxiety sensitivity, each separately in its own model. It was first investigated whether treatment group (ACT or CBT workbook condition) was associated with: (a) the dependent variables, PTSD- and depression-related symptoms, separately, and (b) the mediators, self-compassion, mindfulness, and anxiety sensitivity, separately, from pre- to post-treatment for participants in both the ACT and CBT workbook conditions. Using Preacher and Hayes’ Indirect mediation macro (2008), each post-treatment mediator and post-treatment dependent variable was put in its own model, with the same pre-treatment mediator and pre-treatment dependent variable entered as covariates. It was hypothesized that each of the potential mediators (in its own simple model) would mediate the relation between treatment group and outcome, demonstrated by bootstrapped bias corrected and accelerated 95% confidence intervals which did not contain zero (ab path) (Preacher & Hayes, 2004).

**PTSD-related symptoms.**

*SCS.* As can be seen in Figure 2, as hypothesized, treatment group was significantly associated with change in PTSD-related symptoms (B = -7.5838, p < .01). In addition, treatment group was significantly associated with self-compassion. Participants in the ACT workbook condition experienced greater increases in self-compassion than did participants in the CBT workbook condition (B = .4877, p < .01).
Additionally, changes in self-compassion were associated with changes in PTSD-related symptoms ($B = -6.0179, p < .01$). Finally, entering both treatment group and self-compassion into the model led to a significant decrease in the effect of treatment group on changes in PTSD-related symptoms. Bootstrapped bias corrected and accelerated 95% confidence intervals with 5,000 iterations were $-5.7480 – -1.0424$ (Preacher & Hayes, 2004, 2008).

**MAAS.** As can be seen in Figure 3, as hypothesized, treatment group was significantly associated with change in PTSD-related symptoms ($B = -6.4820, p < .01$). In addition, treatment group was significantly associated with mindfulness. Participants in the ACT workbook condition experienced greater increases in mindfulness than did participants in the CBT workbook condition ($B = .5156, p < .01$). Additionally, changes in mindfulness were associated with changes in PTSD-related symptoms ($B = -6.3539, p < .01$). Finally, entering both treatment group and mindfulness into the model led to a significant decrease in the effect of treatment group on changes in PTSD-related symptoms. Bootstrapped bias corrected and accelerated 95% confidence intervals with 5,000 iterations were $-6.4647 – -1.1890$ (Preacher & Hayes, 2004, 2008).

**ASI.** As can be seen in Figure 4, as hypothesized, treatment group was significantly associated with change in PTSD-related symptoms ($B = -6.4560, p < .01$). In addition, treatment group was significantly associated with anxiety sensitivity. Participants in the ACT workbook condition experienced greater decreases in anxiety sensitivity than did participants in the CBT workbook condition ($B = -.7431, p < .01$). Additionally, changes in anxiety sensitivity were associated with changes in PTSD-related symptoms ($B = 5.1489, p < .01$). Finally, entering both treatment group and
anxiety sensitivity into the model led to a significant decrease in the effect of treatment group on changes in PTSD-related symptoms. Bootstrapped bias corrected and accelerated 95% confidence intervals with 5,000 iterations were -7.0188 – -1.5276 (Preacher & Hayes, 2004, 2008).

**Depression-related symptoms.**

**SCS.** As can be seen in Figure 5, as hypothesized, treatment group was significantly associated with change in depression-related symptoms ($B = -1.1378, p < .01$). In addition, treatment group was significantly associated with self-compassion. Participants in the ACT workbook condition experienced greater increases in self-compassion than did participants in the CBT workbook condition ($B = .4894, p < .01$). Additionally, changes in self-compassion were associated with changes in depression-related symptoms ($B = -1.0496, p < .01$). Finally, entering both treatment group and self-compassion into the model led to a significant decrease in the effect of treatment group on changes in depression-related symptoms. Bootstrapped bias corrected and accelerated 95% confidence intervals with 5,000 iterations were -.9284 – -.2007 (Preacher & Hayes, 2004, 2008).

**MAAS.** As can be seen in Figure 6, as hypothesized, treatment group was significantly associated with change in depression-related symptoms ($B = -1.0748, p < .01$). In addition, treatment group was significantly associated with mindfulness. Participants in the ACT workbook condition experienced greater increases in mindfulness than did participants in the CBT workbook condition ($B = .5110, p < .01$). Additionally, changes in mindfulness were associated with changes in depression-related symptoms ($B = -.5258, p < .01$). Finally, entering both treatment group and mindfulness into the model
led to a significant decrease in the effect of treatment group on changes in depression-related symptoms. Bootstrapped bias corrected and accelerated 95% confidence intervals with 5,000 iterations were -.6417–-.0288 (Preacher & Hayes, 2004, 2008).

ASI. As can be seen in Figure 7, as hypothesized, treatment group was significantly associated with change in depression-related symptoms (B = -1.0807, p < .01). In addition, treatment group was significantly associated with anxiety sensitivity. Participants in the ACT workbook condition experienced greater decreases in anxiety sensitivity than did participants in the CBT workbook condition (B = -.7445, p < .01). Additionally, changes in anxiety sensitivity were associated with changes in depression-related symptoms (B = .4910, p < .01). Finally, entering both treatment group and anxiety sensitivity into the model led to a significant decrease in the effect of treatment group on changes in depression-related symptoms. Bootstrapped bias corrected and accelerated 95% confidence intervals with 5,000 iterations were -.7352–-.1068 (Preacher & Hayes, 2004, 2008).

Multiple mediation. Using Preacher and Hayes Indirect macro (2008), multiple mediation was conducted using the same three mediators: self-compassion, mindfulness, and anxiety sensitivity. All three post-treatment mediators and the post-treatment dependent variable were put into their own model, with the same pre-treatment mediators and pre-treatment dependent variable entered as covariates.

PTSD-related symptoms. As can be seen in Figure 8, as hypothesized, treatment group was significantly associated with change in PTSD-related symptoms (B = -7.3943, p < .01). In addition, treatment group was significantly associated with each of the mediators. Participants in the ACT workbook condition experienced greater increases in
self-compassion (B = .4968, p < .01), greater increases in mindfulness (B = .5797, p < .01), and greater decreases in anxiety sensitivity (B = -.7640, p < .01) than did participants in the CBT workbook condition. Only changes in anxiety sensitivity were associated with changes in PTSD-related symptoms (B = 3.9584, p < .01). Finally, as can be seen in Table 6, entering both treatment group and all three mediators into the model led to a significant decrease in the effect of treatment group on changes in PTSD-related symptoms. Bootstrapped bias corrected and accelerated 95% confidence intervals with 5,000 iterations were -9.8414– -2.3698 for the total group. Only anxiety sensitivity emerged as a unique individual mediator (specific indirect effect) among the total group with bootstrapped bias corrected and accelerated 95% confidence intervals (5,000 iterations) of -6.2432– -.9771 (Preacher & Hayes, 2008).

**Depression-related symptoms.** As can be seen in Figure 9, as hypothesized, treatment group was significantly associated with change in depression-related symptoms (B = -1.1439, p < .01). In addition, treatment group was significantly associated with each of the mediators. Participants in the ACT workbook condition experienced greater increases in self-compassion (B = .4912, p < .01), greater increases in mindfulness (B = .5609, p < .01), and greater decreases in anxiety sensitivity (B = -.7743, p < .01) than did participants in the CBT workbook condition. Only changes in self-compassion and anxiety sensitivity were associated with changes in depression-related symptoms (B = -.7511, p < .01; B = .2720, p < .05, respectively). Finally, as can be seen in Table 7, entering both treatment group and all three mediators into the model led to a significant decrease in the effect of treatment group on changes in depression-related symptoms. Bootstrapped bias corrected and accelerated 95% confidence intervals with 5,000
iterations were -1.1823–-.2328 for the total group. Both self-compassion (most important) and anxiety sensitivity (second most important) emerged as unique individual mediators (specific indirect effects) among the total group with bootstrapped bias corrected and accelerated 95% confidence intervals (5,000 iterations) of -.8099–-.0962 and -.5408–-.0142, respectively (Preacher & Hayes, 2008).

**Discussion**

The central aim of the present study was to examine the relations between treatment group (CBT or ACT workbook condition) and outcomes (PTSD- and depression-related symptoms), separately. In particular, we examined three process variables previously associated with the ACT workbook (Russo et al., manuscript in preparation): self-compassion (as measured by the SCS), mindfulness (as measured by the MAAS), and anxiety sensitivity (as measured by the ASI) in both simple and multiple mediation models. For both outcomes (PTSD- and depression-related symptoms), each of the three process variables individually mediated the relation between treatment group and outcome. The ACT workbook condition led to better outcomes via each of these mediators individually. In the multiple mediation models, all three process variables were entered into the model together as a group. We found that the total group of mediators mediated the relations between treatment group and outcomes (PTSD- and depression-related symptoms). Again, the ACT workbook condition led to better outcomes via the total group of mediators. Interestingly, anxiety sensitivity emerged as a unique individual mediator (specific indirect effect) among the group of total mediators in the model of PTSD-related symptoms. In the model of depression-related symptoms, both self-compassion (most important) and anxiety sensitivity (second most important) emerged as specific indirect effects among the total group of mediators.
Summary of Results

Evaluation of group equivalence at pre-treatment. In summary, our random assignment procedure was effective in yielding equivalence between the two workbook conditions ($N = 67$; CBT condition = 30; ACT condition = 37) on demographic variables (e.g., diagnosis, education, age), readiness to change, current relationship with anxious suffering, and assessed outcome and process variables. We were quite liberal in our exclusionary criteria and allowed individuals to participate even if they reported current psychotherapy treatment and/or medication usage, as we were most interested in evaluating the effectiveness of each workbook under naturalistic conditions. Not surprisingly, approximately 30% of participants in the CBT workbook condition and 46% of participants in the ACT workbook condition reported seeing a mental health professional for anxiety concurrently with study participation. In addition, approximately 50% of the CBT workbook condition and 46% of the ACT workbook condition reported taking medication for anxiety concurrently with study participation. Yet, CBT and ACT workbook conditions did not differ in current psychotherapy or with medication usage. Additionally, a series of ANOVAs were conducted in order to determine if outcomes (PTSD- and depression-related symptoms) differed at post-treatment depending upon whether participants were concurrently taking medication for anxiety and/or were in current psychotherapy. Results indicated that concurrent anxiety medication and/or psychotherapy did not significantly impact PTSD- or depression-related symptom scores at post-treatment. Next, a series of ANOVAs were conducted in order to determine if both the CBT and ACT workbook conditions were equivalent at pre-intervention across
the assessed outcome and process domains. As expected, none of the outcome or process variables reliably discriminated between workbook conditions prior to treatment.

The original study. In the original study, repeated measures ANOVAs were conducted for depression- (BDI-II) and PTSD- (PCL-C) related symptoms, mindfulness (MAAS), self-compassion (SCS), and anxiety sensitivity (ASI), each with group (CBT or ACT workbook condition) serving as the between group factor and time serving as the within group factor with two levels (pre-and post-intervention) for those participants (N = 67) who completed both pre-and post-intervention assessment batteries. Consistent with previous meta-analyses supporting the effectiveness of self-help interventions for anxiety (Glasgow & Rosen, 1978; Hirai & Clum, 2006; Marrs, 1995; Menchola, Arkowitz, & Burke, 2007), participants in both workbook conditions demonstrated improvements with large effect sizes from pre-to-post treatment for PTSD-and depression-related symptoms ($\eta^2_p = .39$ and $\eta^2_p = .44$, respectively). There also existed significant Group x Time interactions for both PTSD- and depression-related symptoms, with pre- to post-intervention improvements being greater in the ACT workbook condition relative to the CBT workbook condition (Cohen’s $d = .44$—small-to-medium effect size, Cohen’s $d = .61$—medium-to-large effect size, respectively). In terms of the process variables (self-compassion, mindfulness, and anxiety sensitivity), we hypothesized that the two workbooks would influence the measures differentially over the three month period, as has been suggested by previous research (Block, 2002; Branstetter et al., 2004; Forman et al., 2007; Hayes et al., 2006; Lappalainen et al., 2007; Zettle & Hayes, 1986; Zettle & Rains, 1989). Not surprisingly, participants reported low levels of both self-compassion and mindfulness at pre-intervention and scores improved significantly over time, with
large effect sizes ($\eta^2_p = .37$, $\eta^2_p = .46$, respectively). Significant Group x Time interactions were also present for self-compassion and mindfulness with medium-to-large effect sizes (Cohen’s $d = .59$, Cohen’s $d = .60$, respectively), with greater improvements being made for the ACT workbook condition compared to the CBT workbook condition. Furthermore, in terms of anxiety sensitivity, participants at pre-treatment reported high levels of anxiety sensitivity, which improved significantly over time ($\eta^2_p = .55$—large effect size). Finally, pre- to post-intervention improvements in anxiety sensitivity scores were greater in the ACT workbook condition relative to the CBT workbook condition, as supported by a significant Group x Time interaction (Cohen’s $d = .56$—medium effect size).

The present study. In the present study, we were most interested in examining whether three process variables mediated the relations between treatment group (CBT or ACT workbook condition) and two outcomes (PTSD- and depression-related symptoms). Both simple and multiple mediation were conducted, and we hypothesized that the ACT workbook condition would lead to better outcomes via the proposed mediators. The three process variables included self-compassion (as measured by the SCS), mindfulness (as measured by the MAAS), and anxiety sensitivity (as measured by the ASI). They were chosen given their previous association with the ACT workbook in the original study described above (Russo et al., manuscript in preparation). In addition, the variables were chosen given their relatedness to one another, but lack of multicollinearity. Pearson correlations were conducted among the three variables, and as expected, all three were correlated ($p < .01$) with one another. The correlation between mindfulness and self-compassion was .43, the correlation between mindfulness and anxiety sensitivity was -
.343, and the correlation between self-compassion and anxiety sensitivity was -.398 (see Table 5). In terms of the three simple mediation models for PTSD-related symptoms, self-compassion, mindfulness, and anxiety sensitivity mediated the relationship between treatment group and PTSD-related symptoms with significant paths from treatment group to each mediator (ACT workbook led to better outcomes) and from each mediator to PTSD-related symptoms. The relation between treatment group and PTSD-related symptoms decreased significantly when each mediator was entered into the model. With regard to the three simple mediation models for depression-related symptoms, self-compassion, mindfulness, and anxiety sensitivity mediated the relationship between treatment group and depression-related symptoms with significant paths from treatment group to each mediator (ACT workbook led to better outcomes) and from each mediator to depression-related symptoms. The relation between treatment group and depression-related symptoms decreased significantly when each mediator was entered into the model.

The current study also examined both outcomes (PTSD- and depression-related symptoms) in their own multiple mediation models with self-compassion, mindfulness, and anxiety sensitivity entered as a total group of mediators. It was hypothesized that the total group of mediators would mediate the relations between treatment group and both outcomes (PTSD- and depression-related symptoms). In addition, it was hypothesized that the ACT workbook condition would lead to better outcomes via the total group of mediators. Given the mediators’ correlations with one another, we felt confident that results could be attributed to true relations, rather than simply multicollinearity. Results supported these hypotheses. For the model of PTSD-related symptoms, participants in
the ACT workbook condition experienced greater increases in self-compassion, greater increases in mindfulness, and greater decreases in anxiety sensitivity than did participants in the CBT workbook condition. Only changes in anxiety sensitivity were associated with changes in PTSD-related symptoms (b path). In addition to the total group of mediators significantly decreasing the effect of treatment group on changes in PTSD-related symptoms, anxiety sensitivity emerged as a unique individual mediator (specific indirect effect) among the total group, suggesting that anxiety sensitivity is especially important in this relation. Perhaps the ACT workbook was more effective in teaching about and targeting anxiety sensitivity for individuals suffering from PTSD-related symptoms. Likewise, for the model of depression-related symptoms, participants in the ACT workbook condition experienced greater increases in self-compassion, greater increases in mindfulness, and greater decreases in anxiety sensitivity than did participants in the CBT workbook condition. Only changes in self-compassion and anxiety sensitivity were associated with changes in depression-related symptoms (b paths). In addition to the total group of mediators significantly decreasing the effect of treatment group on changes in depression-related symptoms, both self-compassion (most important) and anxiety sensitivity (second most important) emerged as unique individual mediators (specific indirect effects) among the total group. These results suggest that there may be something special about self-compassion and anxiety sensitivity as mediators in the relation between treatment group and depression-related symptoms. It appears that the ACT workbook more effectively taught about and targeted self-compassion and anxiety sensitivity for readers suffering from depression-related
symptoms. Alternatively, it may be that something about the ACT workbook resonated more with readers suffering from depression-related symptoms.

**CBT and ACT Workbooks**

Given the unanimous simple and multiple mediation results in favor of the ACT workbook condition, our discussion would not be complete without a deeper look at both the CBT and ACT workbooks used in the original study. *The Cognitive Behavioral Workbook for Anxiety* (Knaus, 2008), the CBT workbook, encourages mastery and control of anxiety and fear-related symptoms. It does so through the use of cognitive behavioral techniques to help readers change and eliminate their negative cognitions, including a focus on techniques used within REBT. The book does not include any mindful acceptance strategies, such as self-compassion or mindfulness, and discusses acceptance only briefly to illustrate that individuals cannot control every aspect of their lives. There is no mention of anxiety sensitivity as a concept, however, Knaus discusses “parasitic anxieties and fears” (2008, p. 1) as those which are “needless and largely psychological” (2008, p. 1).

On the other hand, the ACT workbook, *The Mindfulness and Acceptance Workbook for Anxiety* (Forsyth & Eifert, 2007), explicitly teaches readers how to move with their barriers through acceptance-based strategies, including self-compassion and mindfulness. In fact, readers receive concrete guidance on how to apply self-compassion and mindfulness in both internal and external anxiety-inducing situations using a variety of exercises. Moreover, the ACT workbook includes an audio CD, consisting primarily of mindfulness exercises, whereas the CBT workbook lacks a multimedia companion. Additionally, similar to the CBT workbook, there is no explicit mention of anxiety
sensitivity in the ACT workbook. However, the ACT workbook provides psychoeducation about various anxiety disorders, and discusses the idea that sufferers of panic disorder are typically afraid of fear itself, the essence of anxiety sensitivity.

Therefore, the fact that *The Mindfulness and Acceptance Workbook for Anxiety* (Forsyth & Eifert, 2007) explicitly teaches self-compassion and mindfulness strategies to readers likely contributes, at least in part, to both self-compassion and mindfulness mediating the relations between treatment group and outcomes (PTSD- and depression-related symptoms), separately, with greater improvements in the ACT workbook condition relative to the CBT workbook condition. In addition, in both multiple mediation models, participants’ self-compassion and mindfulness scores showed greater improvements for the ACT workbook condition relative to the CBT workbook condition, and self-compassion emerged as a specific indirect effect in the model of depression-related symptoms. It seems likely that the ACT workbook targeting self-compassion explicitly influenced its emergence as an important mediator. Additionally, the fact that anxiety sensitivity is more directly discussed in the ACT workbook than it is in the CBT workbook may contribute to anxiety sensitivity mediating the relations between treatment group and outcomes (PTSD- and depression-related symptoms), separately, with greater improvements for the ACT workbook condition relative to the CBT workbook condition. In addition, in both multiple mediation models, participants’ anxiety sensitivity scores showed greater improvements for the ACT workbook condition relative to CBT workbook condition, and anxiety sensitivity emerged as a specific indirect effect in both models. It seems unlikely that anxiety sensitivity emerged as an important mediator in both models due to the brief description of fear of fear in the ACT workbook. What
seems more probable is that there was something about the presentation of the ACT workbook which resonated with participants regarding anxiety sensitivity, which the CBT workbook failed to complete as effectively.

Finally, it is unclear whether mindfulness is truly not as important a mediator compared to self-compassion and anxiety sensitivity when all three are entered as a total group of mediators into multiple mediation models for PTSD- and depression-related symptoms, separately. Previous research has demonstrated that mindfulness is an important mediator of outcomes (e.g., Keng et al., 2012; Kuyken et al., 2010; Nyklicek & Kuijpers, 2008; Thompson & Waltz, 2010), however some research also shows mindfulness to be a less robust predictor of depressive and anxious symptoms than self-compassion (Van Dam et al., 2011). Perhaps the measure of mindfulness used in the current study (MAAS) was not as effective in assessing the construct targeted by the ACT workbook as another measure might have been. As stated by Rosch (2007), there currently exist six measures examining “mindfulness,” none of which seem to measure the same construct. Baer et al. (2006) conducted factor analyses of the combined pool of items from the MAAS, FMI, KIMS, CAMS, and MQ and found that they collectively contain five clear, interpretable facets of mindfulness. These facets include (1) nonreactivity to inner experience, (2) observing/noticing/attending to sensations/perceptions/thought/feelings, (3) acting with awareness/automatic pilot/concentration/nondistraction, (4) describing/labeling with words, and (5) nonjudging of experience. It appears that some of these facets of mindfulness may be more important than others for individuals suffering from PTSD- or depression-related symptoms. For example, individuals suffering from PTSD- or depression-related
symptoms may be less aware of and focused on their own thoughts, feelings, and experiences, and instead choose to function on “auto pilot.” In addition, it may be especially difficult for them to remain nonreactive or nonjudgmental to an experience, especially if they blame themselves or feel worthless. Therefore, these facets may be the more helpful ones to test in future studies examining the importance of mindfulness as a potential mediator of treatment group and outcome. According to Baer et al. (2006), the MAAS only assesses the general tendency to be attentive to and aware of present-moment experience in daily life, which addresses only two of the five facets identified as interpretable by Baer et al. (2006). Therefore, perhaps results of the current study would be different had we included a measure of mindfulness which assessed for all five facets.

**Limitations**

Similar to the importance of the above discussion regarding workbook content, it is important to note a number of limitations of the current study. First, as mentioned previously, the two workbooks were chosen given their approximate equivalence in length, reading level, and because they both focused on a transdiagnostic approach to treat a range of anxiety-related problems. Nevertheless, the ACT workbook explicitly taught self-compassion and mindfulness skills, whereas the CBT workbook did not, creating a potential confound given that both the simple and multiple mediation analyses showed greater improvements for the ACT workbook relative to the CBT workbook. Additionally, the ACT workbook included a CD of experiential exercises, whereas the CBT workbook lacked a multimedia companion. Similarly, the lack of process measures previously associated with the CBT workbook is somewhat problematic. Although the goal of the current study was to focus on the three potential mediators (self-compassion,
mindfulness, and anxiety sensitivity) previously associated with the ACT workbook (Russo et. al., manuscript in preparation), perhaps additional examination of potential mediators previously associated with the CBT workbook may have allowed for a richer, more persuasive argument in that each workbook is mediated by different processes (and not by processes associated with the other workbook).

Secondly, the low sample size in each workbook condition (ACT: \(N = 37\); CBT: \(N = 30\)) may have impacted results. It may have allowed the two workbook conditions in the original study to appear more similar in outcome and process measures at post-treatment (within-group analyses) than would be the case in other, more rigorously controlled randomized clinical trials. On the other hand, it is also possible in the current study that other mediators may have emerged as specific indirect effects among the total group (in the multiple mediation models), had there been a larger sample size. Likewise, perhaps we would have found a greater number of significant paths in the multiple mediation models with a larger sample. Finally, although inconsistent with studies examining ACT and CBT (Block, 2002; Branstetter et al., 2004; Forman et al., 2007; Hayes et al., 2006; Lappalainen et al., 2007; Zettle & Hayes, 1986; Zettle & Rains, 1989), perhaps with a larger sample size the two workbook conditions would have produced more equivalent between-group results in the original study, providing an argument for more similarities rather than differences between the two workbooks.

Likewise, attrition was a serious problem in our original study. Inconsistent with the most recent meta-analysis of self-help interventions for anxiety disorders, which yielded low attrition rates for all included studies (12.3%, \(SD = 12.10\); Hirai & Clum, 2006), the original study found a 68% attrition rate from pre- to post-intervention. Yet, it
is important to note that the previous meta-analysis examined minimal therapist contact interventions, whereas our original study used a purely self-administered methodology. In other words, the low dropout rates typically reported apply primarily to self-help interventions with more therapist contact than our study used. We attempted to offer the purest self-administered treatment possible, which included correspondence with participants, via email only, to send assessment links and/or reminders to complete online assessments, in the hope of finding support for a cost-effective alternative to a lack of therapist access. Researcher responses to participant emails provided no therapeutic content, encouragement, or clarification of workbook material. The high attrition rate we found may be related to the lack of therapist contact (Bower, Richards, & Lovell, 2001; Hirai & Clum, 2006; Newman, Erickson, Przeworski, & Dzus, 2003), possibly suggesting that we were, in fact, successful in our attempted creation of a more purely self-administered treatment design.

We simply cannot assume that the behavior of buying a self-help book will translate into actually reading it, let alone working with the material. Though speculative, it seems likely that books may be bought without any intention to actually read them. In the present study, individuals may have enrolled in order to receive a free copy of a self-help workbook, with no intent of participating in the study. It is also possible that participants may have worked with their book, but not been committed to completing the online assessments. Additionally, attrition in our original study did not vary by condition, suggesting that it is unlikely that individuals chose to discontinue participation because they were randomized to a workbook that they did not prefer or find promising. Moreover, a further limitation includes the report and use of only pre-and
post-treatment data, accounting for the change in participants’ ratings over a three-month time period. Therefore, the generalization from acute treatment response to longer follow-up periods should be made with caution.

Finally, the limited process literature makes it difficult to compare CBT and ACT self-help workbooks for anxiety in randomized clinical trials of any sort. There exists a lack of development and operationalization of concepts, specifically for ACT, which results in mechanisms of change not being measured in ways that are fully consistent with the ACT model (Hayes et al., 2006). For example, there exist six measures examining “mindfulness,” none of which seem to measure the same construct (Rosch, 2007). Likewise, researchers would be wise to consider and use a broader range of treatment outcome measures in process-related research (e.g., values and quality of life; Arch & Craske, 2008) for the most accurate and informative data regarding potential treatment mechanisms.

**Self-Help and Mechanisms**

In addition to there being a dearth of general process literature compared to outcome literature, there is also very little research examining self-help and mediators or mechanisms of change. There are a number of meta-analyses examining self-help literature for various disorders, including anxiety and depression, but these do not include mediation analyses (e.g., Gould & Clum, 1993; Hirai & Clum, 2006; Marrs, 1995; Menchola et al., 2007). The studies that have been conducted on self-help and mediators have demonstrated mixed results. Menchola et al. (2007) wrote that some studies have found significant changes on cognitive variables in cognitive self-help groups when compared with controls (e.g., Bowman, Scogin, & Lyrene, 1995; Jamison & Scogin,
1995; Parry & Killick, 1998), but that the changes may not be unique to cognitive groups (e.g., Bowman et al., 1995). In addition, studies have failed to demonstrate cognitive or behavioral variables as mediators of depression (Floyd, Scogin, McKendree-Smith, Floyd, & Rokke, 2004; McKendree-Smith, 1998; Rohen, 2002). Given this paucity of mediation research related to self-help, it is not surprising that there is no evidence to date of any self-help studies altering anxiety sensitivity, one of the two mechanisms found to be a specific indirect effect (multiple mediation) in the present study.

There are, however, two studies that altered constructs related to self-compassion, the other mechanism found to be a specific indirect effect (multiple mediation) in the current study. In the first study, Gilbert and Irons (2004) examined self-criticism and the use of compassionate imagery to help reduce it. Participants included eight individuals from a self-help depression group who viewed themselves as self-critical. Participants were instructed to record their critical thinking (self-attacking and self-soothing thoughts and images) daily (for two weeks) and then weekly. Researchers also met with participants for four evening sessions, in which the nature of self-criticism was discussed, participants handed in their diaries, discussed previous weeks, discussed self-compassion, conducted compassionate mind imagery exercises and relaxation processes, and discussed the experiences of using these exercises. Although not a purely self-administered design, the study showed a significant improvement in participants’ reported ability to self-soothe, seemingly through the use of self-compassion strategies. The success cannot be entirely attributed to the compassionate mind imagery work, however, as participants also reported that working as a group had been helpful (Gilbert & Irons, 2004). The second study conducted by Kelly, Zuroff, and Shapira (2009)
investigated whether two self-help interventions designed to improve either self-soothing or resistance to self-attacks would be effective at decreasing depression among self-critical acne sufferers. Participants receiving the self-soothing intervention engaged in compassionate imagery and self-talk, whereas those in the attack-resisting intervention engaged in strong, resilient, retaliating imagery and self-talk. A third control condition also existed. Results showed that the self-soothing intervention lowered shame and skin complaints, but not depression. In contrast, the attack-resisting intervention lowered depression, shame, and skin complaints, and was especially effective at lowering depression for those high in self-criticism (Kelly et al., 2009).

Together, these two articles demonstrate the importance of self-compassion and related constructs in our current understanding of self-help interventions for depression-related symptoms. It is unclear whether self-compassion, as defined by Neff (2003a), is most useful for particular types of negative affect (e.g., shame) whereas a stronger form of protecting oneself may be more effective for other forms of negative affect (e.g., depression-related symptoms). Because mediation analyses were not conducted for either of the two studies, we cannot know for sure that any of the proposed self-compassion-related constructs would truly serve as mechanisms of change. More research is sorely needed regarding both self-compassion and anxiety sensitivity as potential mechanisms of change in self-help studies. In the current study, it appears that the ACT workbook, with its explicit focus on self-compassion, was able to improve both PTSD- and depression-related symptoms through utilization of that mechanism. It is unclear whether the ACT workbook’s minimal focus on anxiety sensitivity (fairly equivalent to that of the CBT workbook) can be fully responsible for anxiety sensitivity’s
importance as a mechanism of change for participants in the ACT workbook condition more so than for participants in the CBT workbook condition.

Conclusion and Future Directions

Future research may seek to examine the question of who is most likely to benefit from a self-help book, which is of paramount importance in terms of the dissemination and application of self-help in and outside the mental health care context. For instance, within a stepped care model, it would be useful to identify those who may benefit from self-help initially before more time-intensive and costly forms of intervention are offered. To the best of our knowledge, such decisions are made somewhat arbitrarily based on diagnosis or anecdotal clinical impressions. Another variable which is often neglected in the current literature is assessment of participant compliance in terms of completion of assignments and application of learned skills (Hirai & Clum, 2006). Newman et al. (2003) also noted the challenge in determining the variables at play in final results due to the heterogeneity of self-help tools themselves (e.g., bibliotherapy manual, computer program, videotape) as well as how the tools were used. Future research may wish to monitor the amount of time participants report reading a book or practicing exercises, as well as the types of media being used (e.g., worksheets, audiotapes). Likewise, future research may wish to test participants continuously throughout their use of a self-help workbook (rather than simply pre- and post-treatment), in an effort to determine which processes may be responsible for changes they undergo during specific points in time.

It will also be of paramount importance to conduct more research examining various processes related to self-help, and specifically self-compassion, mindfulness, and anxiety sensitivity. The current study demonstrated something unique about self-
compassion and anxiety sensitivity as mechanisms of the ACT workbook, which are not otherwise being evaluated in the existing literature. We were only able to find two studies to date which altered self-compassion-related constructs through the use of self-help interventions, but neither included mediation analyses. In addition, it appears that anxiety sensitivity is commonly measured as an outcome variable, rather than as a mediator. Finally, as mentioned previously, it is unclear whether mindfulness may also serve as a unique individual mediator (specific indirect effect) in future multiple mediation models, if another measure of mindfulness (different definition) is tested.

Thus, more mediation analyses, and specifically multiple mediation, are necessary in order to truly understand which mechanisms are most important in a treatment. As mentioned previously, mediation research conducted on ACT and CBT for anxiety disorders is limited. To the best of our knowledge, only three published, peer-reviewed ACT treatment studies (Bond & Bunce, 2000; Forman et al., 2007; Zettle, 2003) have attempted to answer questions regarding mechanisms of change, but failed to produce true, formal mediation analyses (Arch & Craske, 2008). According to Preacher and Hayes (2008), there exists less attention in both methodological and applied literature for multiple mediation compared to simple mediation. In fact, there are many advantages to conducting multiple mediation in lieu of separate simple mediation models, including that if mediation is found it can be concluded that the set of variables mediates the effect of X on Y, the possibility to determine which specific variables mediate the X ➔ Y effect, conditional on the presence of the other mediators in the model, and the possibility to determine the relative magnitudes of the specific indirect effects associated with all mediators (Preacher & Hayes, 2008). Future multiple mediation research focused on
processes common and unique to various therapeutic approaches in anxiety interventions will be important in the creation and implementation of new treatment options.

Overall, the results of the current study demonstrated that self-compassion, mindfulness, and anxiety sensitivity are single and multiple mediators for the relations between treatment group (CBT or ACT workbook condition) and outcomes (PTSD- and depression-related symptoms). The ACT workbook led to better outcomes via the proposed mediators in both simple and multiple mediation models. Of particular note is that anxiety sensitivity emerged as a specific indirect effect for the multiple mediation models of both PTSD- and depression-related symptoms, whereas self-compassion emerged as a specific indirect effect only for the multiple mediation model of depression-related symptoms. We hope that the present study is but the first step in a series of studies that will be undertaken to further explore the effectiveness of various self-help interventions for anxiety, as well as to engage in formal mediation analyses (and particularly multiple mediation) to better understand a treatment’s mechanisms of change. In addition, we hope that future research examines the potential benefits of a purely self-administered design, while addressing the limitations noted above. Taken together, the original and current studies help us to understand how these ACT and CBT workbooks differ, and how to use this information to create other effective self-help interventions for anxiety in the future.
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Table 1. Description of each ACT process and its associated intervention target.

<table>
<thead>
<tr>
<th>ACT Process</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>Defusion vs. Cognitive Fusion</td>
<td>Clients are taught to observe the process and products of their thinking, and to notice a distinction between that activity and the self or observer. In other words, defusion helps create space between the person and the mental chatter, and experientially clients learn that they are not their thoughts.</td>
</tr>
<tr>
<td>Self as Context vs. Attachment to the Conceptualized Self</td>
<td>Learning to detach from the conceptualized self is fundamentally about fostering a self-as-observer perspective.</td>
</tr>
<tr>
<td>Contact with the Present Moment vs. Dominance of the Conceptualized Past and Future</td>
<td>Because the present moment is the only place where people can act to make a difference in their lives, ACT teaches clients to approach the present moment by learning to pay attention, on purpose, right where they are, and without buying into judgment. In other words, learning to be present counteracts tendencies to avoid or pull back, both from painful thoughts and feelings and from life circumstances and contexts, some of which may be part of valued activities.</td>
</tr>
</tbody>
</table>
Table 1 (continued). *Description of each ACT process and its associated intervention target.*

<table>
<thead>
<tr>
<th>ACT Process</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>Acceptance vs. Experiential Avoidance</strong></td>
<td>Experiential avoidance describes inflexible efforts to escape or avoid unpleasant private events (i.e., thoughts, feelings, and physiological events) and the situations that might occasion them. Acceptance literally means to “take what is offered,” and involves fully embracing one’s experience at the moment just as it is, without attempting to alter its form or frequency and persisting in behavior in the service of valued ends.</td>
</tr>
<tr>
<td><strong>Values vs. Lack of Values Clarity</strong></td>
<td>In ACT, values are defined as directions for purposive action. Acting in the service of one’s values underlies all of the ACT processes (e.g., mindfulness is not an end in itself, but a way to foster value-guided action). Value-guided action is what clients and therapists are working toward, and all human beings will differ in terms of core values that matter to them.</td>
</tr>
<tr>
<td><strong>Committed Action vs. Avoidant Persistence</strong></td>
<td>This domain refers to movement forward with great reluctance, or no movement at all. ACT teaches clients value-guided action, as well as commitment to act, which is different from clients’ attempts to act. ACT promotes the use of concrete goals, which, unlike values, can be achieved.</td>
</tr>
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</table>
Table 2. *Demographic characteristics of the three groups of study participants.*

<table>
<thead>
<tr>
<th>Assessed Variables</th>
<th>Entire Sample (N = 208)</th>
<th>Non-Completers (N = 141)</th>
<th>Treatment Completers (N = 67)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>37.45</td>
<td>35.45</td>
<td>41.64</td>
</tr>
<tr>
<td>SD</td>
<td>12.16</td>
<td>11.34</td>
<td>12.83</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
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<tr>
<td>Female</td>
<td>157</td>
<td>105</td>
<td>52</td>
</tr>
<tr>
<td>Male</td>
<td>51</td>
<td>36</td>
<td>15</td>
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<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Caucasian</td>
<td>176</td>
<td>120</td>
<td>56</td>
</tr>
<tr>
<td>Other</td>
<td>32</td>
<td>21</td>
<td>11</td>
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<tr>
<td>Residency</td>
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<td>United States</td>
<td>158</td>
<td>111</td>
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<tr>
<td>International</td>
<td>50</td>
<td>30</td>
<td>20</td>
</tr>
<tr>
<td>Diagnosis</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Anxiety disorder</td>
<td>119</td>
<td>83</td>
<td>36</td>
</tr>
<tr>
<td>Mood disorder</td>
<td>22</td>
<td>14</td>
<td>8</td>
</tr>
<tr>
<td>Never been diagnosed</td>
<td>40</td>
<td>26</td>
<td>14</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some college or beyond</td>
<td>177</td>
<td>119</td>
<td>58</td>
</tr>
<tr>
<td>High school, GED, or less</td>
<td>31</td>
<td>22</td>
<td>9</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>86</td>
<td>64</td>
<td>22</td>
</tr>
<tr>
<td>Married</td>
<td>89</td>
<td>54</td>
<td>35</td>
</tr>
<tr>
<td>Other</td>
<td>33</td>
<td>23</td>
<td>10</td>
</tr>
<tr>
<td>Mental Health Treatment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>86</td>
<td>60</td>
<td>26</td>
</tr>
<tr>
<td>No</td>
<td>122</td>
<td>81</td>
<td>41</td>
</tr>
<tr>
<td>Medication Use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>103</td>
<td>71</td>
<td>32</td>
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<tr>
<td>No</td>
<td>105</td>
<td>70</td>
<td>35</td>
</tr>
</tbody>
</table>
Table 3. Pre- and post-intervention means and standard deviations of outcome indices for the CBT and ACT workbook conditions.

<table>
<thead>
<tr>
<th>Assessed Outcomes</th>
<th>CBT</th>
<th>ACT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td>BDI</td>
<td>24.0ₐ(13.6)</td>
<td>19.0ₛ(b10.9)</td>
</tr>
<tr>
<td>PCL</td>
<td>48.7ₐ(16.7)</td>
<td>42.9ₛ(b15.1)</td>
</tr>
</tbody>
</table>

*Note: Standard deviations appear in parentheses; Means in the same row that do not share subscripts differ at p < .05 at post-intervention; BDI (Beck Depression Inventory), PCL (PTSD Checklist)*
Table 4. **Pre- and post-intervention means and standard deviations of process variables for the CBT and ACT workbook conditions.**

<table>
<thead>
<tr>
<th>Assessed Processes</th>
<th>CBT</th>
<th>ACT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td>ASI</td>
<td>35.8&lt;sub&gt;a&lt;/sub&gt;(14.1)</td>
<td>27.3&lt;sub&gt;b&lt;/sub&gt;(15.3)</td>
</tr>
<tr>
<td>MAAS</td>
<td>3.0&lt;sub&gt;a&lt;/sub&gt;(.9)</td>
<td>3.4&lt;sub&gt;b&lt;/sub&gt;(.7)</td>
</tr>
<tr>
<td>SCS</td>
<td>2.3&lt;sub&gt;a&lt;/sub&gt;(.6)</td>
<td>2.5&lt;sub&gt;b&lt;/sub&gt;(.5)</td>
</tr>
</tbody>
</table>

*Note:* Standard deviations appear in parentheses; Means in the same row that do not share subscripts differ at p < .05 at post-intervention; ASI (Anxiety Sensitivity Index), MAAS (Mindful Attention Awareness Scale), SCS (Self-Compassion Scale)
Table 5. *Pearson correlations of treatment group, outcomes, and proposed mediators at post-treatment.*

<table>
<thead>
<tr>
<th></th>
<th>Group</th>
<th>PCL</th>
<th>BDI</th>
<th>MAAS</th>
<th>SCS</th>
<th>ASI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
<td>1</td>
<td>-.220</td>
<td>-.293*</td>
<td>.287*</td>
<td>.277*</td>
<td>-.273*</td>
</tr>
<tr>
<td>PCL</td>
<td>-.220</td>
<td>1</td>
<td>.714**</td>
<td>-.636**</td>
<td>-.560**</td>
<td>.612**</td>
</tr>
<tr>
<td>BDI</td>
<td>-.293*</td>
<td>.714**</td>
<td>1</td>
<td>-.418**</td>
<td>-.553**</td>
<td>.413**</td>
</tr>
<tr>
<td>MAAS</td>
<td>.287*</td>
<td>-.636**</td>
<td>-.418**</td>
<td>1</td>
<td>.430**</td>
<td>-.343**</td>
</tr>
<tr>
<td>SCS</td>
<td>.277*</td>
<td>-.560**</td>
<td>-.553**</td>
<td>.430**</td>
<td>1</td>
<td>-.398**</td>
</tr>
<tr>
<td>ASI</td>
<td>-.273*</td>
<td>.612**</td>
<td>.413**</td>
<td>-.343**</td>
<td>-.398**</td>
<td>1</td>
</tr>
</tbody>
</table>

*Note.* * = Correlation is significant at the 0.05 level (2-tailed). ** = Correlation is significant at the 0.01 level (2-tailed).
Table 6. Total and specific indirect effects of proposed mediators in the relation between treatment group and PTSD-related symptoms.

<table>
<thead>
<tr>
<th></th>
<th>Point Estimate</th>
<th>SE</th>
<th>BCa 95% CI Lower</th>
<th>BCa 95% CI Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Indirect Effect</td>
<td>-5.6330</td>
<td>1.8702</td>
<td>-9.8414</td>
<td>-2.3698</td>
</tr>
<tr>
<td>Mindfulness</td>
<td>-1.5436</td>
<td>1.3928</td>
<td>-5.0624</td>
<td>.6620</td>
</tr>
<tr>
<td>Self-Compassion</td>
<td>-1.0653</td>
<td>.9938</td>
<td>-3.3605</td>
<td>.5833</td>
</tr>
<tr>
<td>Anxiety Sensitivity</td>
<td>-3.0241</td>
<td>1.3043</td>
<td>-6.2432</td>
<td>-.9771</td>
</tr>
</tbody>
</table>
Table 7. Total and specific indirect effects of proposed mediators in the relation between treatment group and depression-related symptoms.

<table>
<thead>
<tr>
<th></th>
<th>Point Estimate</th>
<th>SE</th>
<th>BCa 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lower</td>
</tr>
<tr>
<td>Total Indirect Effect</td>
<td>-.6603</td>
<td>.2413</td>
<td>-1.1823</td>
</tr>
<tr>
<td>Mindfulness</td>
<td>-.0807</td>
<td>.1496</td>
<td>-.4701</td>
</tr>
<tr>
<td>Self-Compassion</td>
<td>-.3690</td>
<td>.1768</td>
<td>-.8099</td>
</tr>
<tr>
<td>Anxiety Sensitivity</td>
<td>-.2106</td>
<td>.1326</td>
<td>-.5408</td>
</tr>
</tbody>
</table>
Figure 1. The ACT hexaflex model.

Note. Top diagram represents the ACT model of psychopathology, whereas the bottom diagram represents the ACT targets of intervention.
Indirect Effects: Point Estimate = -2.9351, SE = 1.1719
Confidence Intervals: -5.7480—-1.0424

Figure 2. Self-compassion as a mediator of the relation between treatment group and PTSD-related symptoms.

Note. * = significant at p < .01.
Indirect Effects: Point Estimate = -3.2759, SE = 1.3210
Confidence Intervals: -6.4647 — -1.1890

Figure 3. Mindfulness as a mediator of the relation between treatment group and PTSD-related symptoms.

Note. * = significant at p < .01.
Indirect Effects: Point Estimate = -3.8259, SE = 1.3774
Confidence Intervals: -7.0188 — 1.5276

Figure 4. Anxiety sensitivity as a mediator of the relation between treatment group and PTSD-related symptoms.

Note. * = significant at p < .01.
Indirect Effects: Point Estimate = -.5137, SE = .1881
Confidence Intervals: -.9284—-.2007

Figure 5. Self-compassion as a mediator of the relation between treatment group and depression-related symptoms.

Note. * = significant at p < .01.
Indirect Effects: Point Estimate = -0.2687, SE = 0.1556
Confidence Intervals: -0.6417—-0.0288

Figure 6. Mindfulness as a mediator of the relation between treatment group and depression-related symptoms.

Note. * = significant at p < .01.
Indirect Effects: Point Estimate = -.3655, SE = .1570
Confidence Intervals: -.7352 — -.1068

Figure 7. Anxiety sensitivity as a mediator of the relation between treatment group and depression-related symptoms.

Note. * = significant at p < .01.
Figure 8. Multiple mediation model of the relation between treatment group and PTSD-related symptoms.

Note. * = significant at p < .01.
Figure 9. Multiple mediation model of the relation between treatment group and depression-related symptoms.

Note. * = significant at p < .01, ** = significant at p < .05.
Appendix A:

Self-Report Questionnaires
Beck Depression Inventory (BDI-II)

Please read each group of statements carefully, then pick out the one statement in each group which best describes the way you have been feeling during the **past 2 weeks including today**. Circle the number beside the statement you have picked. **Do not** leave any statements blank. If several statements in the group seem to apply equally well, circle each one. Be sure to read all the statements in each group before making your choice.

1. **Sadness**
   0  I do not feel sad.
   1  I feel sad much of the time.
   2  I am sad all the time.
   3  I am so sad or unhappy that I can’t stand it.

2. **Pessimism**
   0  I am not discouraged about my future.
   1  I feel more discouraged about my future than I used to be.
   2  I do not expect things to work out for me.
   3  I feel my future is hopeless and will only get worse.

3. **Past Failure**
   0  I do not feel like a failure.
   1  I have failed more than I should have.
   2  As I look back, I see a lot of failures.
   3  I feel that I am a total failure as a person.

4. **Loss of Pleasure**
   0  I get as much pleasure as I ever did from the things I enjoy.
   1  I don’t enjoy things as much as I used to.
   2  I get very little pleasure from the things I used to enjoy.
   3  I can’t get any pleasure from the things I used to enjoy.

5. **Guilty Feelings**
   0  I don’t feel particularly guilty.
   1  I feel guilty over many things I have done or should have done.
   2  I feel quite guilty most of the time.
   3  I feel guilty all of the time.

6. **Punishment Feelings**
   0  I don’t feel I am being punished.
   1  I feel I may be punished.
   2  I expect to be punished.
   3  I feel I am being punished.

7. **Self Dislike**
   0  I feel the same about myself as ever.
   1  I have lost confidence in myself.
   2  I am disappointed in myself.
   3  I dislike myself.
8. Self Criticism
0 I don’t criticize or blame myself more than usual.
1 I am more critical of myself than I used to be.
2 I criticize myself for all my faults.
3 I blame myself for everything bad that happens.

9. Suicidal Thoughts and Dying
0 I don’t have any thoughts of killing myself.
1 I have thoughts of killing myself, but I would not carry them out.
2 I would like to kill myself.
3 I would kill myself if I had the chance.

10. Crying
0 I don’t cry any more than I used to.
1 I cry more than I used to.
2 I cry over every little thing.
3 I feel like crying but I can’t.

11. Agitation
0 I am no more restless or wound up than usual.
1 I feel more restless or wound up than usual.
2 I am so restless or agitated that it’s hard to stay still.
3 I am so restless or agitated I have to keep moving or doing something.

12. Loss of Interest
0 I have not lost interest in other people or activities.
1 I am less interested in other people or things than before.
2 I have lost most of my interest in other people or things.
3 It’s hard to get interested in anything.

13. Indecisiveness
0 I make decisions about as well as ever.
1 I find it more difficult to make decisions than usual.
2 I have much greater difficulty in making decisions than I used to.
3 I have trouble making any decisions.

14. Worthlessness
0 I do not feel I am worthless.
1 I don’t consider myself as worthwhile or useful as I used to.
2 I feel more worthless compared to other people.
3 I feel utterly worthless.

15. Loss of energy
0 I have as much energy as ever.
1 I have less energy than I used to have.
2 I don’t have enough energy to do very much.
3 I don’t have enough energy to do anything.
16. Change in Sleeping Pattern
0 I have not experienced any change in my sleeping pattern.
1a I sleep somewhat more than usual.
1b I sleep somewhat less than usual.
2a I sleep a lot more than usual.
2b I sleep a lot less than usual.
3a I sleep most of the day.
3b I wake up 1-2 hours early and can’t get back to sleep.

17. Irritability
0 I am no more irritable than usual.
1 I am more irritable than usual.
2 I am much more irritable than usual.
3 I am irritable all the time.

18. Changes in Appetite
0 I have not experienced any changes in my appetite.
1a My appetite is somewhat less than usual.
1b My appetite is somewhat greater than usual.
2a My appetite is much less than before.
2b My appetite is much greater than usual.
3a I have no appetite at all.
3b I crave food all the time.

19. Concentration difficulty.
0 I can concentrate as well as ever.
1 I can’t concentrate as well as usual.
2 It’s hard to keep my mind on anything for very long.
3 I find I can’t concentrate on anything.

20. Tiredness or Fatigue
0 I am no more tired or fatigued than usual.
1 I get more tired or fatigued more easily than usual.
2 I am too tired or fatigued to do a lot of the things I used to do.
3 I am too tired or fatigued to do most of the things I used to do.

21. Loss of interest in Sex
0 I have not noticed any recent changes in my interest in sex.
1 I am less interested in sex than I used to be.
2 I am much less interested in sex now.
3 I have lost interest in sex completely.
PTSD Checklist-Civilian (PCL-C)

Below is a list of problems and complaints that people sometimes have in response to stressful experiences. Please read each one carefully, put an X in the box to indicate how much you have been bothered by that problem in the past month.

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Not at all</th>
<th>A little bit</th>
<th>Moderately</th>
<th>Quite a bit</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Repeated, disturbing <em>memories, thoughts, or images</em> of a stressful experience?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>Repeated, disturbing <em>dreams</em> of a stressful experience?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>Suddenly <em>acting or feeling</em> as if a stressful experience were happening again (as if you were reliving it)?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>Feeling <em>very upset</em> when something reminded you of a stressful experience?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>Having physical reactions (e.g., heart pounding, trouble breathing, sweating) when something reminded you of a stressful experience?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>Avoiding <em>thinking about</em> or talking about a stressful experience or avoiding having feelings related to it?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7</td>
<td>Avoiding <em>activities or situations</em> because they reminded you of a stressful experience?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8</td>
<td>Trouble remembering important parts of a stressful experience?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9</td>
<td><em>Loss of interest</em> in activities that you used to enjoy?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10</td>
<td>Feeling <em>distant or cut off</em> from other people?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11</td>
<td>Feeling <em>emotionally numb</em> or being unable to have loving feelings for those close to you?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12</td>
<td>Feeling as if your <em>future</em> will somehow be <em>cut short</em>?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>13</td>
<td>Trouble <em>falling or staying asleep</em>?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>14</td>
<td>Feeling <em>irritable</em> or having angry outbursts?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>15</td>
<td>Having <em>difficulty concentrating</em>?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Being &quot;super-alert&quot; or watchful or on guard?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>---</td>
<td>---------------------------------------------</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>16</td>
<td>Feeling <em>jumpy</em> or easily startled?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
**Self-Compassion Scale (SCS)**

Items are rated on a 5-point Likert scale (1 = almost never to 5 = almost always)

1. I try to be understanding and patient towards those aspects of my personality I don’t like.
2. I’m kind to myself when I’m experiencing suffering.
3. When I’m going through a very hard time, I give myself the caring and tenderness I need.
4. I’m tolerant of my own flaws and inadequacies.
5. I try to be loving towards myself when I’m feeling emotional pain.
6. When I see aspects of myself that I don’t like, I get down on myself.
7. When times are really difficult, I tend to be tough on myself.
8. I can be a bit cold-hearted towards myself when I’m experiencing suffering.
9. I’m disapproving and judgmental about my own flaws and inadequacies.
10. I’m intolerant and impatient towards those aspects of my personality I don’t like.
11. When I feel inadequate in some way, I try to remind myself that feelings of inadequacy are shared by most people.
12. I try to see my failings as part of the human condition.
13. When I’m down and out, I remind myself that there are lots of other people in the world feeling like I am.
14. When things are going badly for me, I see the difficulties as part of life that everyone goes through.
15. When I fail at something that’s important to me I tend to feel alone in my failure.
16. When I think about my inadequacies it tends to make me feel more separate and cut off from the rest of the world.
17. When I’m feeling down I tend to feel like most other people are probably happier than I am.
18. When I’m really struggling I tend to feel like other people must be having an easier time of it.
19. When something upsets me I try to keep my emotions in balance.
20. When I’m feeling down I try to approach my feelings with curiosity and openness.
21. When something painful happens I try to take a balanced view of the situation.
22. When I fail at something important to me I try to keep things in perspective.
23. When something upsets me I get carried away with my feelings.
24. When I’m feeling down I tend to obsess and fixate on everything that’s wrong.
25. When something painful happens I tend to blow the incident out of proportion.
26. When I fail at something important to me I become consumed by feelings of inadequacy.
Mindful Attention Awareness Scale (MAAS)

Below is a collection of statements about your everyday experience. Using the 1–6 scale below, please indicate how frequently or infrequently you currently have each experience. Please answer according to what *really reflects* your experience rather than what you think your experience should be.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Almost always</td>
<td>Very frequently</td>
<td>Somewhat frequently</td>
<td>Somewhat infrequently</td>
<td>Very infrequently</td>
<td>Almost never</td>
</tr>
</tbody>
</table>

1. _____I could be experiencing some emotion and not be conscious of it until some time later.
2. _____I break or spill things because of carelessness, not paying attention, or thinking of something else.
3. _____I find it difficult to stay focused on what’s happening in the present.
4. _____I tend to walk quickly to get where I’m going without paying attention to what I experience along the way.
5. _____I tend not to notice feelings of physical tension or discomfort until they really grab my attention.
6. _____I forget a person’s name almost as soon as I’ve been told it for the first time.
7. _____It seems I am “running on automatic” without much awareness of what I’m doing.
8. _____I rush through activities without being really attentive to them.
9. _____I get so focused on the goal I want to achieve that I lose touch with what I am doing right now to get there.
10. _____I do jobs or tasks automatically, without being aware of what I’m doing.
11. _____I find myself listening to someone with one ear, doing something else at the same time.
12. _____I drive places on “automatic pilot” and then wonder why I went there.
13. _____I find myself preoccupied with the future or the past.
14. _____I find myself doing things without paying attention.
15. _____I snack without being aware that I’m eating.
Anxiety Sensitivity Index (ASI)

Please rate each item by selecting one of the five answers for each question. Please answer each statement by circling the number that best applies to you.

0 = Very Little
1 = A little
2 = Some
3 = Much
4 = Very Much

1. It is important not to appear nervous
2. When I cannot keep my mind on a task, I worry that I might be going crazy
3. It scares me when I feel shaky
4. It scares me when I feel faint
5. It is important to me to stay in control of my emotions
6. It scares me when my heart beats rapidly
7. It embarrasses me when my stomach growls
8. It scares me when I am nauseous (sick in the stomach)
9. When I notice my heart beats rapidly, I worry that I might have a heart attack
10. It scares me when I become short of breath
11. When my stomach is upset, I worry that I might be seriously ill
12. It scares me when I am unable to keep my mind on a task
13. Other people notice when I feel shaky
14. Unusual body sensations scare me
15. When I am nervous, I worry that I might be mentally ill
16. It scares me when I am nervous