TRAUMA EXPOSURE, POSTTRAUMATIC STRESS, AND MINDFULNESS

by

KIRSTEN TRABBIC GABRIEL

(Under the Direction of Karen S. Calhoun, Ph.D.)

ABSTRACT

The purpose of this study was to examine the relationships among trauma exposure, posttraumatic stress symptoms, and dispositional mindfulness. Traumatic life events are no longer considered outside the range of normal human experience and can often exert long-term, deleterious changes in individual functioning. Exposure to trauma with an intense emotional response frequently leads to posttraumatic stress disorder (PTSD). Although there is growing empirical support for the effectiveness of mindfulness-based interventions to a range of psychological disorders, little basic research exists to explore relationships among trauma exposure, post-trauma symptomology, and mindfulness. The hypothesis that dispositional mindfulness would moderate the relationships between trauma exposure and PTSD was not supported. However, mindfulness was found to significantly mediate the relationship between trauma exposure and PTSD. These findings lend support to the application of mindfulness-based applications for trauma related symptoms.

INDEX WORDS: Trauma, Traumatic Life Events, Posttraumatic Stress Disorder, PTSD, Mindfulness

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DEDICATION

This project is dedicated to Herman and Patricia Trabbic, whose loving kindness, compassion, generosity, and wisdom makes it possible for this service to continue.

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CHAPTER 1

INTRODUCTION

Experiencing or witnessing events that involve serious injury, threats to physical integrity, or death can lead to acute and ongoing distress. Psychological trauma can be measured as a function of self-reported emotional response to an event with fear, helplessness, or horror. Dispositional mindfulness has been proposed to play a role in adjusting to traumatic experiences (Follette, Palm, & Pearson, 2006). The current study aimed to empirically examine the nature of these theorized relationships.

Traumatic life events can often exert long-term, deleterious changes in individual functioning. Over the past several decades, the number of people seeking psychological services for trauma-related syndromes has steadily increased. There has been a parallel increase in the development of Empirically Supported Treatments designed to alleviate psychological suffering (Barlow, 2001; Chambless & Hollon, 1998; Linehan, Armstrong, Suarez, Allmon, & Heard, 1991; Robinson, Berman, & Neimeyer, 1990). Mindfulness and acceptance based interventions are being investigated and included in psychotherapy protocols to compliment traditional treatments. The current study was designed to measure the role of mindfulness as it relates to traumatic life events and PTSD symptoms.

Trauma Exposure

Traumatic life events are no longer considered outside the range of normal human experience. Rather, research has now demonstrated that a majority of people will

experience at least one traumatic event in their lifetime (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). In a national sample of 4000 women in the U.S., 69% reported exposure to one or more traumatic life events (Resnick, Kilpatrick, Dansky, Saunders, & Best, 1993). These experiences include motor vehicle accidents, natural disasters, combat, and interpersonal violence.

While spontaneous recovery from physical and psychological distress related to a traumatic event is generally expected, 15-20% of a trauma exposed population manifested subsequent long term symptoms of psychological distress such as depression and anxiety (King, King, Foy, Keane, & Fairbank, 1999). Anxiety-related symptoms of posttraumatic stress disorder (PTSD) include re-experiencing the trauma during nightmares and flashbacks, avoidance of trauma-related stimuli, and physiological hyperarousal. Prevalence rates of PTSD provided by the National Co-Morbidity Study suggested that approximately 5% of men and 10% of women exposed to any traumatic life event developed PSTD symptoms (Kessler et al., 1995). Among combat veterans, PTSD rates are estimated at 15-30% (Kulka et al., 1990). Kilpatrick and colleagues (1992) reported that the lifetime prevalence rates of PTSD among rape victims are 60-65%. These rates identify post-trauma adjustment as an important area for clinical research.

Research has established several risk factors for developing PTSD such as severity of assault and lack of social support (Breslau, Kessler, Chilcoat, Schultz, Davis & Andreski, 1998). Persistent dissociation has also been identified as a significant risk factor for PTSD following interpersonal violence (Calhoun, Gidycz, Michels, Van Wynsberghe, & Hammond, 2003; Ehlers, 2006; Halligan, Michael, Clark, & Ehlers,

2003; Kisiel & Lyons, 2001; Ozer, Best, Lipsey, & Weiss, 2003). Dissociation is generally defined by memory impairments, depersonalization, and derealization and has been characterized as a possible coping mechanism with a variety of potentially traumatic events (Putnam, Carlson, & Ross, 1996; Spiegel & Cardena, 1991).

Clinical scientists are searching for resiliency factors that may contribute to improved post-trauma adjustment. Mindfulness, or non-judgmental attention to the present moment, is being increasingly examined for its role in mitigating psychological distress (Baer, 2003; Follette, Palm, & Pearson, 2006; Teasdale et al., 2000). Mindfulness has been described as the self-regulation of attention and awareness that immerses the individual into a psychophysiological state in which one can regulate arousal with "detached awareness" (Tacon, Caldera, & Ronaghan, 2004). Researchers are even suggesting that dissociation be regarded as the opposite of mindfulness on an attentional continuum (Becker & Zayfert, 2001). Consequently, there is speculation that people who are inherently more mindful may be at decreased risk for developing PTSD due to the potential for increased awareness of, and ability to appropriately respond to, trauma-related triggers.

Posttraumatic Stress Disorder (PTSD)

A large body of literature has established direct relationships between trauma exposure and multiple psychiatric difficulties including depressive disorders, substance abuse, eating disorders, and most notably, PTSD (Kessler et al., 1995; Resnick et al., 1993). PTSD is classified as an anxiety disorder in the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-IV-TR;* APA, 2000). Criterion A of the syndrome includes exposure to a traumatic event in which "the person experienced, witnessed, or was

confronted with an event or events that involved actual or threatened death or serious injury, or threat to the physical integrity of self or others." For diagnostic purposes, a "trauma" is defined as both the event and an emotional response that involved intense fear, helplessness, or horror. Three clusters of symptoms that characterize PTSD are intrusive re-experiencing, emotional numbing or avoidance, and associated symptoms of hyperarousal. Significant interference in social and/or occupational functioning is also required for a formal diagnosis.

PTSD is now considered a public health concern, in part due to mounting evidence that it can develop into a chronic and disabling condition, often associated with long-term physical health problems as well (Koss & Figueredo, 2004; Sachs-Ericsson, Blazer, Plant, & Arnow, 2005). The course of post-trauma syndromes can vary. Some survivors report no or few acute symptoms and spontaneous recovery for the long term. However, a percentage of trauma-exposed adults report symptoms persisting more than three months with some evidence of maladaptive psychosocial functioning. Untreated, long term symptoms of posttraumatic stress may worsen and become increasingly debilitating both psychologically and physically. Complex PTSD syndromes are recognized in the clinical literature, described as dissociative disorders, borderline personality disorder, and associated medical complications (Messman-Moore, Long, & Siegfried, 2000).

Mindfulness

The construct of mindfulness has been described in different ways in the psychological literature (Langer, 1989). Within clinically-oriented publications, mindfulness is generally considered paying attention in a particular way: on purpose, in

the present moment, and non-judgmentally (Kabat-Zinn, 1990; Kabat-Zinn, 1994). In this approach to mindfulness, also known as Insight Meditation and *vipassana* from a Buddhist tradition, participants are encouraged to attend to internal experiences (thoughts, feelings, and physical sensations) and external phenomena (smells, sights, sounds) without attachment to meaning or outcome.

Bishop and an international team of clinical researchers (2004) proposed an operational definition of mindfulness. An objective of consensus on the language of mindfulness was intended to provide the conceptual basis on which to develop measurement instruments and mindfulness-based treatment programs (Bishop et al., 2004). This definition has two primary elements, self-regulation of attention and taking a particular stance toward one's present moment experiences. For clinical purposes, this is a useful definition as it lends itself to assessment and generalization. Non-judgmental observing may help attenuate the negative emotional valence often associated with intrusive thoughts of traumatic episodes. Based on this language, it stands to reason that by practicing intentional attention and a non-judgmental approach to distressing traumatic memories and other posttraumatic symptoms, these symptoms may occur less frequently, less intensely, and in shorter durations.

There is a growing consensus in the clinical and social psychology literature regarding the construct of mindfulness (Bishop et al., 2004). Brown and Ryan (2003), social psychologists, reported "mindfulness is thought to create a witnessing or observant stance toward ongoing emotional and other psychological experiences, the result of which appears, from the present results, to promote a balanced or even-keeled emotional life." (p. 839). Mindfulness is conceptualized as being trait-like whereby every individual

is, to some extent, more or less mindful. Naturally occurring states, or dispositional mindfulness, are of interest in this study as it is necessary to establish its baseline relationship with PTSD symptoms in order to more accurately measure change.

Theoretical Formulation: Trauma, PTSD, and Mindfulness

Clinical researchers have described psychological correlates of trauma exposure and psychopathology in terms of dysregulation in multiple domains, including behavioral, cognitive, interpersonal, and of the Self. Mindfulness training has been applied to improve coping skills in a traumatized population including distress tolerance, affect regulation, and interpersonal skills (Linehan, 1993a; Linehan, 1993b). Ostensibly, individuals experiencing posttraumatic symptoms may benefit from an intentional shift in to a non-judgmental approach to their present-moment experiences.

However, there are only modest data to support the direct relationships among exposure to traumatic events, posttraumatic stress, and mindfulness (Becker & Zayfert, 2001). The rationale for the current study is to extend the psychological literature as it relates to trauma exposure and mindfulness. Theoretically, continued practice of specific mindful activities could alter the dispositional tendency of a person to think and act in mindful ways (Brown & Ryan, 2004). Mindfulness practices and increased awareness of present moment phenomena may serve as a protective factor promoting healthy post-trauma adjustment.

In a recent review, Shapiro, Carlson, Astin, and Freedman (2006) raised questions about the mechanisms underlying mindfulness. They discuss possible explanations for explaining how mindfulness affects positive change. In contrast to the tendency to dissociate that could contribute to emotional maladjustment, the tendency to be mindful

could allow for experiential learning that negative emotions need not be avoided, but rather could naturally diminish without intervention. The present study explores the role of mindfulness in the acquisition and maintenance of posttraumatic stress symptoms. The purpose of this project was to empirically examine and quantify the construct of mindfulness as it relates to trauma exposure and symptoms of posttraumatic stress.

Follette, Palm, and Rasmussen Hall (2004) outlined future research directions for scientists studying mindfulness as a psychological construct related to trauma and recovery. The authors first discussed the need for operational definitions of mindfulness. Second, improved measurement strategies need to be developed and employed. Finally, studies are needed to examine whether and how mindfulness is associated with improved mental health outcomes.

Follette, Palm, and Pearson (2006) further addressed the role mindfulness could play in treating trauma-related syndromes. They described a theoretical conceptualization of clinical problems related to long-term correlates of trauma and how applications of mindfulness for trauma survivors could be incorporated into traditional exposure treatments. Avoidance strategies to cope with aversive internal stimuli are often adopted, frequently resulting in increased panic, emotional numbing, and impairments in interpersonal functioning. Efforts toward "thought suppression" tend to have a paradoxical effect of increasing the frequency of material intended to be avoided to manage fear and anxiety related to intrusive and unpleasant thoughts and memories (Clark, Ball, & Pape, 1991; Hayes et al., 1996).

An essential quality of mindfulness is the non-judgmental attention to present-moment experiences. As such, Follette and colleagues (2006) suggested that mindfulness

skills, as part of a comprehensive behavioral intervention program, could be particularly useful in decreasing avoidance of painful memories, feelings, and thoughts by encouraging adoption of a non-judgmental stance toward private experiences. In a traumatized population, mindfulness strategies are intended to increase awareness and cognitive flexibility to assist in responding to intense emotional experiences that might otherwise be avoided. Quantifying the mitigating role of dispositional mindfulness could provide additional understanding of how a non-judgmental stance toward the present might contribute to positive adjustment in a traumatized sample. Thus, the question of how mindfulness is related to trauma is central to the aim of this study.

Third Wave Behavior Therapy

The field of clinical psychology has been depicted as entering the Third Wave of Behavior Therapy (Cordaciotto, 2005; Hayes, 2005). The First Wave was described as "clinical applications" of the experimental analyses of behavior, or scientifically derived theory and clinical methods. The Second Wave included an expanded emphasis on cognition and a renewed interest in internal experiences of thoughts and feelings. Cognitive Behavioral Therapies became the predominant orientation in research-based clinical training programs. The Third Wave is being described as empirically valid, behaviorally-based interventions that now include core concepts such as mindfulness and acceptance. A brief review of these Third Wave interventions may contextualize the importance of examining mindfulness as it relates to trauma. Particular attention will be given to how components of these programs may be useful for trauma survivors in order to prevent the development of or ameliorate already existing post-traumatic symptoms.

Mindfulness Based Stress Reduction (MBSR).

Kabat-Zinn, Lipworth, & Burney (1985) published debut data on the efficacy of Mindfulness Based Stress Reduction (MBSR) programs that were designed to improve coping with medical and psychological problems. Kabat-Zinn led the field in recognizing the possibility that mindfulness practices may be of value in complementing traditional mental health and medical interventions. Researchers were encouraged to submit the programs to scientific scrutiny (Kabat-Zinn, 1988; Kabat-Zinn, 2005; Kabat-Zinn, Lipworth, & Burney, 1985; Kabat-Zinn et al., 1992).

Kabat-Zinn and colleagues developed MBSR programs (Kabat-Zinn et al., 1992) an eight-week program that consisted of weekly two-hour group sessions and one all-day session. A prominent component to the program was teaching participants to notice their breathing and use breathing as an anchor to the present moment. When attention wanders, participants were consistently invited to bring their attention back to the breath, rather than following the "story" of their private experiences. Participants were taught sitting and walking mindfulness meditations as well as mindful yoga. Participants were also instructed to practice formal mindfulness meditations on a daily basis. Teachers suggested that the present moment is the only moment in which individuals can make conscious decisions, not in the past or the future. Individuals were trained in multiple formal and informal meditation practices in an effort to broaden the possibilities of experiencing a moment of mindful awareness (Hahn, 1975; Hahn, 1990; Suzuki, 1973).

One of the earliest publications on mindfulness-based interventions was on the clinical use of mindfulness meditation for the self-regulation of chronic pain (Kabat-Zinn, Lipworth, & Burney, 1985). The authors reported significant improvements on measures

of medical symptoms, mood states, and coping with pain. It was in this article that Kabat-Zinn and colleagues first articulated the origins and lineages of mindfulness or Insight meditation. They also suggested that these programs were intended to compliment "treatment-as-usual" or other traditional medical and psychological interventions. An effectiveness study of the MBSR programs was published (Kabat-Zinn et al., 1992). The authors found that scores on multiple measures of anxiety and depression improved pre-post treatment, as well as at three-month follow-up. They conceded that random assignment and control groups were lacking and thus findings from this pilot study were considered preliminary.

Nonetheless, a three-year follow-up of the aforementioned MBSR programs (Miller, Fletcher, & Kabat-Zinn, 1995) found that many of the positive outcomes were sustained for three years. Additional research was published regarding the effectiveness of mindfulness programs and their beneficial effects on Breast and Prostate Cancer (Massion, Teas, Herbert, Wertheimer, & Kabat-Zinn, 1995; Ott, Norris, & Bauer-Wu, 2006). These findings suggested that practicing mindfulness could have long-term benefits for improving trait-like coping styles. Psychologists observed the positive outcomes in these mindfulness-based programs and invited other research clinicians to develop the theory (Becker & Zayfert, 2001). Researchers are beginning to identify other applications of Third Wave Behavior Therapies.

Dialectical Behavior Therapy (DBT).

PTSD often develops secondary to interpersonal violence. A history of physical and/or sexual abuse as a child can contribute to multiple problems, including PTSD, substance abuse, depression, and personality disorders. Borderline Personality Disorder

(BPD) is characterized by emotional instability and significant interpersonal difficulties and is often associated with childhood sexual abuse and other traumatic life events. Generally, Linehan (1993a) described individuals with BPD as having a combination of biological hypersensitivity and a history of "pervasive invalidating environments" that can contribute to emotional dysregulation and a lack of coping skills acquisition. Linehan and colleagues applied mindfulness as a skill to improve mental health and quality of life for patients with BPD. Dialectical Behavior Therapy (DBT) will be discussed in detail as it most directly relates to clinical applications of observed relationships among trauma exposure, PTSD, dissociation, and mindfulness (Linehan, Armstrong, Suarez, Allmon, & Heard, 1991; Shapiro et al., 2006).

Theoretically, the persistent inability to maintain awareness is characteristic of "impulsive and mood-dependent behaviors" that are often associated with posttraumatic adjustment. Linehan and her colleagues taught core coping skills to their clients and provided manualized support for clinicians to practice DBT (Linehan, 1993a, 1993b). Other researchers using similar techniques found support for improving affect management for women with PTSD related to childhood sexual abuse (Wolfsdorf & Zlotnick, 2001).

DBT treatment consisted of weekly group and individual therapy for one year. Linehan emphasized learning emotion regulation, distress tolerance, interpersonal effectiveness, and self-management skills through application of mindfulness practices. Following mastery of these primary skills, treatment can advance to decrease behaviors related to posttraumatic stress, still recognition that trauma-focused therapy can be

stressful. Strong self-soothing skills are required to tolerate the treatment without a relapse of self-defeating behaviors.

Linehan developed the "Core Mindfulness Skills" of DBT which included learning to observe, describe, and participate in the present moment. These skills were developed through the effective practice of taking a non-judgmental stance toward private experiences. DBT depicts mindfulness as what one can do (observe) and how one can do it (non-judgmentally). The ability to implement these proficiencies and adopt this approach can serve to significantly decrease psychological distress and improve quality of life (Linehan, 1993a; Linehan, 1993b).

Rather than focusing on formal meditation practices as in Kabat-Zinn's (1990) Mindfulness Based Stress Reduction programs, DBT emphasized the informal mindfulness practices that could be integrated into everyday life. For example, participants were instructed to mindfully eat, brush their teeth, wash dishes, and fold clothes. These mindful behaviors were expected to serve as alternative ways to cope with intrusive thoughts, avoidance tendencies, and hyperarousal. Practicing formal and informal mindfulness meditations was intended to provide the means by which to tolerate intense affective dysregulation and severe suicidal ideation.

Prior to publishing the DBT text and workbook (Linehan, 1993a; Linehan, 1993b), these researchers studied the behaviors of chronically suicidal patients. In one study (Linehan, Armstrong, Suarez, Allmon, & Heard, 1991), 44 women diagnosed with BPD were randomly assigned to either DBT or a treatment-as-usual (TAU) group. The authors reported significantly fewer and less severe episodes of parasuicidal behavior in those women assigned to the DBT group. Of those women hospitalized for suicidal

intent, fewer days of hospitalization were required compared to women in the TAU group. These findings, in addition to the significantly lower attrition rate (16.7% for DBT vs. 58.3% for TAU), suggested that there are viable components in DBT that can improve the quality of life for individuals with BPD (Shapiro et al., 2006).

Prolonged exposure and desensitization to trauma-related stimuli are well-established as effective interventions for anxiety (Calhoun & Atkeson, 1991; Foa & Rothbaum, 1998; Follette & Ruzek, 2006; Orsillo, Roemer, & Holowka, 2005; Resick, 2001). Theoretically, exposure to trauma cues decreases PTSD symptoms through the process of systematic desensitization. Cultivating the capacity to pay attention to present moment experiences can serve as an *in vivo* exposure to distressing thoughts, feelings, and images. The practice of mindfulness is conceptualized an as exposure in DBT. Linehan (1993a) articulates how mindfulness can be useful for trauma-related symptoms most readily:

> "In mindfulness practice…patients are instructed to 'experience' exactly what is happening in the moment, without either pushing any of it away or grabbing onto it. They are also instructed to 'step back from' and observe judgmental responses to their own behaviors. Mindfulness practice may be particularly helpful for individuals who are afraid or ashamed of their own thoughts and emotions. The idea is to let thoughts, feelings, and sensations come and go, rise and fall away, without attempting to exert control (although it is important to point out that, in reality, the individual is in control and can stop the process at any point). In its entirety, mindfulness is an instance of exposure to naturally arising thoughts, feelings, and sensations. It may be particularly useful as a way to encourage exposure to somatic cues associated with emotions. The reconditioning lies in the fact that if a person does pull back, so to speak, and simply observes sensations, thoughts, and feelings, they will do just that – come and go. For many borderline individuals, this is an entirely new experience and is important in reducing their fears of emotions." (p. 354).

Linehan integrated mindfulness into a treatment program that allowed clinicians to work more effectively with a challenging population of severely disturbed psychiatric patients, many of whom presented with complex PTSD syndromes. The clinicians practiced the skills as well in order to have both integrity in the teaching and a healthy way to cope with the demands of serving individuals with BPD.

Dissociation appears to be one approach traumatized individuals use to manage painful and overwhelming emotions and memories (Briere, Weathers, & Runtz, 2005). Perhaps this dissociative defense is immediately adaptive with long term adverse consequences. Thus, interventions designed to improve emotion regulation skills, such as the mindfulness components of DBT, would likely be useful to address this dynamic (Finucane & Stewart, 2006; Wells, 2006). Still, it is necessary to quantify the roles of dissociation and mindfulness in such multi-faceted treatment programs.

Relapse Prevention (RP).

As a researcher in the addictions field, Marlatt (1998) included mindfulness components in the Relapse Prevention and Harm Reduction programs with an incarcerated population (Bowen et al., 2006; Marlatt & Donovan, 2005; Witkiewitz, Marlatt, & Walker, 2005). They introduced the term *urge surfing* to describe a skill that can be used for coping with cravings for drugs and alcohol. The attentional skill of observing an urge to use substances increase in intensity, peak, and subside without indulging the craving can be a powerful tool in the face of relapse triggers. Clients are taught to "ride the wave" of a craving, and mindful attention is one tool in teaching this basic behavioral principle (Marlatt & Donovan, 2005). Marlatt and colleagues (2004) reported positive outcomes in decreasing recidivism rates among incarcerated men who

attended a 10-day meditation retreat. They found that post-course participants reported significant improvements in motivation to change, depression and somatization, interpersonal skills, and self-regulation.

Marlatt et al. (2004) hypothesized that clients with co-morbid anxiety and substance disorders could benefit from similar mindfulness practices. Substance abuse has been described as a form of experiential avoidance, similar to dissociation. Given that PTSD is classified as an anxiety disorder, and there is evidence of high co-morbidity between PTSD and substance abuse, it stands to reason that components of this Relapse Prevention program could be applied to trauma-related symptoms.

Acceptance and Commitment Therapy (ACT).

Follette, Palm, and Rasmussen Hall (2004) published a review of the mindfulness and trauma literature. They drew on the Acceptance and Commitment Therapy (ACT) theory and described the relationships between experiential avoidance and mindfulness. Experiential avoidance is considered to be attempts to change the form or frequency of internal events such as memories, feelings, thoughts, and bodily sensations (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). Mindful awareness, and then acceptance, of those private experiences is central to this theoretical orientation.

ACT was developed by Hayes, Strosahl, and Wilson (1999) and has a mindfulness component, although the essence of the treatment lies in Relational Frame Theory (RFT). RFT emphasizes the role of language in the acquisition of both effective and ineffective coping. Proponents of RFT postulated that the "bidirectional nature" of language describes and informs how humans conceptualize both the external world and internal private experiences. Skillful use of language is a core "technology" that is used

to treat mental illness. Increased awareness of how one uses language to describe experiences is considered an important aspect of cognitive restructuring and acceptance of present moment experiences (Hayes et al., 1996).

A core tenet of ACT is derived from behavioral analyses principles and proposes that attempts to avoid disturbing internal and external experiences only perpetuate distress. It has been suggested that dissociation may be a primary form of avoidant coping that is chronically maladaptive (Ozer, Best, Lipsey, & Weiss, 2003). Two early studies on the effectiveness of ACT were conducted. The first was a randomized clinical trial in which 18 depressed women were assigned to either ACT or cognitive therapy (Zettle & Hayes, 1986). They reported that ACT produced greater decreases in depression than cognitive therapy at both post-treatment and 3-month follow-up. In the second study, 31 depressed women were randomly assigned to one of three treatment conditions (ACT, CBT, or wait-list control; Zettle & Raines, 1989). The authors reported decreases in depression in both the cognitive therapy and ACT groups; however, they speculated that underlying mechanism of change appeared different. They speculated that in CBT, the core component of change is recognizing and actively changing maladaptive beliefs. In contrast, in ACT the change in how individuals *relate* to their thoughts is emphasized without necessarily changing them, which is a primary component of mindfulness.

The effectiveness of ACT was further examined by Strosahl, Hayes, Bergan, and Romano (1998) and the intervention was found to promote improvements in depression and anxiety by means of a shift in “meta-cognitive awareness.” They purported that the

changes made as part of the ACT approach are fundamental in nature and therefore likely to be long-lasting.

Mindfulness Based Cognitive Therapy (MBCT).

Teasdale, Segal, and Williams (1995) posed the question: why should attentional control (mindfulness) training combined with cognitive therapy be useful in preventing depressive relapse? This international team of researchers built upon the MBSR program and developed the Mindfulness Based Cognitive Therapy for Depression (MBCT; Segal, Williams, & Teasdale, 2002; Teasdale, Segal, & Williams, 2003). Teasdale and colleagues (2000) presented empirical evidence for the rationale underlying the role of mindfulness in prevention of relapse in depression. They suggested that "decentering" and "disidentification" with thoughts were vital components of mindfulness practice that allowed depressed patients to change how they related to their thoughts and emotions. For example, feelings of worthlessness often associated with depressive cognitions could be *observed* without ruminating about explanations for the present moment experience (Nolen-Hoeksema, 2000).

Teasdale and colleagues (2003) further developed their theories about how mindfulness training related to case conceptualization and intervention. They addressed potential drawbacks and recommended caution when working with vulnerable populations such as patients with active psychosis and/or severe developmental disabilities. The authors also recognized that integrating these practices into existing psychotherapeutic interventions demanded nothing short of a paradigmatic shift. Well-designed treatment outcome studies supported the efficacy of their mindfulness-based interventions (Ma & Teasdale, 2004). These programs have demonstrated utility in

preventing depressive relapse in patients with a history of three or more depressive episodes. This research is controversial due to its only recently developing empirical validation and the lack of mindfulness measures are notable drawbacks. The current project was designed to contribute to the literature documenting a scientific understanding of the role mindfulness plays in chronic psychiatric conditions, particularly PTSD.

Additional Mindfulness-Based Interventions.

In the past decade, several specialized mindfulness-based interventions have been developed. Although yet to be exposed to rigorous scientific scrutiny, an introduction of these interventions was warranted to underscore the broadening applications of mindfulness as a therapeutic tool. Carson, Carson, Gil, and Baucom (2004) introduced Mindfulness Based Relationship Enhancement. The authors drew upon the MBSR programs and emphasized application of mindfulness skills, including compassion and loving kindness, to primary relationships. They used a randomized wait-list controlled design. They also used diary measures to demonstrate how higher levels of mindfulness predicted consecutive days of improved relationship happiness and decreased relational stress.

Psychologists have written specifically about mindful eating to create a balanced relationship with food (Albers, 2003; Kristeller & Hallett, 1999; Wiser & Telch, 1999). Baer (2004) provided clinicians and researchers with an eight-week protocol for Mindfulness Based Cognitive Therapy for Binge Eating. This manualized treatment included standardized research instruments employed as part of the intervention. This team recently published preliminary results of the 10-week programs reporting positive

outcomes for eating disordered related behaviors and depression (Baer, 2004; Baer, Fischer, & Huss, 2006).

Recently, a protocol was published regarding MBCT for prevention of suicidal behavior (Williams, Duggan, Crane, & Fennell, 2006). Harris and Laskin (2004) described Mindfulness Based Trauma Counseling in a brief report; however, they did not provide a protocol or other evidence of efficacy. Nonetheless, these variations on the standardized MBSR/MBCT protocols are developing.

Meta-analysis of Mindfulness-Based Interventions.

Mindfulness-based interventions are increasingly used in clinical practice and examined in empirical studies (Ma & Teasdale, 2004; Roemer & Orsillo, 2002). In a meta-analysis, Baer (2003) provided a comprehensive review of clinical interventions that used mindfulness as a core component of the treatment. Twenty-one studies meeting established criteria were included in the study. Moderate to large effect sizes (d = .5 - .8) were consistently related to improved outcomes on variables of clinical interest. Based on these findings, Baer (2003) concluded that MBSR now meets criteria for the "probably efficacious" designation as defined by the APA Division 12 Task Force on Promotion and Dissemination of Psychological Procedures (1995; Chambless & Hollon, 1998).

Problematically, there were no measures of mindfulness used in any of the treatment outcome studies included in the meta-analysis (Baer, 2003). Published measures of mindfulness have been introduced only within the past five years (Baer, Smith, Jopkins, Krietemeyer, & Toney, 2006). Mindfulness measures were not yet available at the time of the outcome studies; therefore, results could not be directly attributed to changes in mindfulness. Currently, there are several instruments developed

to measure mindfulness (see Cardaciotto, 2005, for a review). Inclusion of such measures in outcome studies can increase researchers' ability to draw causal relationships between mindfulness and treatment outcomes (Gabriel et al., 2006). While there is developing debate on the best measure of mindfulness, there is widespread agreement that there is a need to include mindfulness measures in basic research on trauma (Follette et al., 2006).

Summary and Study Rationale

As described, there are a growing number of mindfulness-based interventions developed for a variety of psychological maladies. However, there are no published studies establishing the direct relationships among trauma exposure, PTSD, and mindfulness. The non-judgmental, present moment focus of mindfulness practices has the potential to mitigate posttraumatic symptoms (Gabriel et al., 2007). Specifically, re-experiencing symptoms can be witnessed from an observing, non-reactive stance. Avoidance symptoms can be addressed through the exposures intrinsic to mindfulness practices. Hyperarousal symptoms can also be non-judgmentally observed and potentially regulated through these practices as well. This study addresses a notable absence in the literature regarding the role of mindfulness related to trauma exposure and posttraumatic symptoms.

Hypotheses

The first hypothesis was that higher levels of mindfulness (Time 1) would predict lower trauma exposure assessed at a three-month follow-up (Time 2). The second hypothesis was that the direct relationship between trauma exposure and PTSD symptoms at Time 2 would be moderated by Time 1 mindfulness. The nature or strength

of the relationship between exposure and trauma-related symptoms was expected to be weaker among individuals with higher levels of dispositional mindfulness.

CHAPTER 2

METHOD

Participants

The participants in this study were 236 undergraduate students enrolled in introductory psychology courses at a large Southeastern university who completed questionnaires at two testing occasions three months apart. The sample was 67.8% female and 32.2% male. Ages ranged between 18 and 47 (mean=19.21, sd=1.95**)**. Eighty-two percent of participants self-identified as Caucasian, 7% African-America, 7% Asian, 2% Hispanic/Latino, 1% American Indian, and 1% Pacific Islander, which represented the demographics of the general university population. Independent samples t-test analyses did not reveal any significant gender or age differences in frequency of trauma exposure, total PTSD symptoms, or dispositional mindfulness, reported in further detail below.

Measures

Demographics.

A nine-item demographic form was used to assess core descriptive variables of interest. Time 1 and Time 2 data were matched based on a unique identifier that each participant generated. The instructions, as specified in the Institutional Review Board approval for this study, read, *"Please create a unique identification code that you can remember in order to match your questionnaire packet at Time 2. We suggest that you use the first letter of your mother's maiden name followed by the day and month of her birth (e.g., W1204 for mother's maiden name "Wozny" born on December 4th)."*

Although there was a 97% return rate at Time 2, data from 123 of 496 (24.7%) participants were unusable due to an inability to match their cases based on this unique identification code, despite considerable efforts made to match cases based on date of birth and other descriptive variables.

Trauma Exposure.

The Traumatic Life Events Questionnaire (TLEQ; Kubany, Leisen, Kaplan, Watson, & Hughes, 2000) was used to measure exposure and emotional reactions to traumatic events. This instrument was selected due to the manner in which it captures a wide range of potentially traumatic events. This measure contained multiple-item queries of exposure to 23 categories of events, including natural disasters, motor vehicle accidents, warfare or combat, sudden death, illness, or injury of loved one or self, adult physical or sexual assault, and childhood physical or sexual abuse. For the TLEQ in the current study, internal consistency reliability value of Cronbach's alpha was .83.

Trauma exposure was calculated in several ways in an effort to capture a range of ways individuals describe their life experiences. A composite score was calculated to determine the frequency of all different types of traumas participants experienced, based on responses to queries such as, "have you ever experienced a natural disaster (flood, hurricane, earthquake, etc.)?" and "were you involved in a motor vehicle accident for which you received medical attention or that badly injured or killed someone?" Then, a composite score was calculated that represented the frequency the participant indicated that they "experienced intense fear, helplessness, or horror" in response to the situation. Only participants who endorsed one or more experiences to which they reacted with

intense fear, helplessness, or horror were included in the analyses. Sixty-five percent of the entire sample was included based on these criteria.

Posttraumatic Stress Disorder (PTSD).

PTSD was measured using the PTSD Screening and Diagnostic Scale (PSDS; Kubany, Leisen, Kaplan, & Kelly, 2000). The PSDS is a 38-item self-report inventory with scores ranging from 0-120, which includes frequency and severity of symptoms. This instrument has well-established reliability and validity from a series of four studies (Kubany et al., 2000). Samples of combat veterans and women with trauma histories were used in their analyses. Internal consistency for the measure is reported as Cohen's alpha coefficient. Alphas for the total score, re-experiencing, avoidance, hyperarousal were .93, .91, .88, and .91, respectively. PTSD scores were calculated a composite of all Criterion B, C, and D symptoms, not only those meeting full criteria for PTSD. Posttraumatic stress was considered a continuous variable, with higher scores reflecting greater symptomatology. For the PSDS in the current study, internal consistency reliability value of Cronbach's alpha was .96.

Mindfulness.

The Mindfulness Attention and Awareness Scale (MAAS) is a 15-item instrument developed to assess the role of mindfulness in psychological well-being (Brown & Ryan, 2003; Carlson & Brown, 2005). The MAAS measures attention to and awareness of present-moment experience in daily life. Items were generated and examined by experts. The items were then exposed to both exploratory factor analyses (EFA) and confirmatory factor analyses (CFA) on two different samples of university students. Both EFA and CFA showed a strong single-factor solution for the items, accounting for 95% of the total

variation (Factor 1 eigenvalue = 7.95; Factor 2 eigenvalue = .66). All items were reverse coded and included statements such as, “I find it difficult to stay focused on what’s happening in the present moment,” and “I find myself preoccupied with the future or the past.” Scores on the MAAS range from 15-90, with higher scores indicating higher levels of mindfulness. The MAAS was considered to be measuring naturally occurring states of dispositional mindfulness with higher scores reflecting increased tendency toward adopting a non-judgmental present moment stance. For the MAAS in the current study, internal consistency reliability value of Cronbach’s alpha was .84.

Procedure

Participants were recruited from the Psychology Research Participant (RP) Pool. This sample was composed of undergraduates who received partial course credit for their participation. The testing sessions (two hours each) were conducted approximately 12 weeks apart. A standard informed consent was provided for all participants in compliance with University Institutional Review Board standards. Participants were provided with modified written debriefing information following Time 1 and full debriefing following Time 2 administrations.

At Time 1, study packets were administered in a large group testing environment by two Research Assistants (RAs). Following a standardized script, the RAs explained the requirements of participation and distributed the packets of measures. The study packets were composed of the described measures. Following completion of the packet, the RAs requested that all participants sign-up for the second session. Participants chose from a variety of testing occasions within approximately 12 weeks of their Time 1 session. Participants provided a current email address in order to receive a reminder to

attend the second session and gain their entire four hours of research credit. Rescheduling was permitted; however, the importance of attendance at the second session was strongly emphasized. Participant names and email addresses were stored separately from self-report measures.

The RAs emailed reminders to participants both one week prior to their Time 2 session and one day prior to their second session. These reminders allowed students time to reschedule their second session, if necessary. At Time 2, participants repeated the questionnaires unmodified from Time 1. Following completion of the packet, they were provided with documentation of their participation. They were also given a debriefing statement compliant with IRB standards. These efforts resulted in a 97% return rate among participants.

CHAPTER 3

RESULTS

Power Analysis and Data Preparation

An algorithm is described by Cohen, Cohen, Aiken and West (2003) in order to calculate sample size. According to this method, 143 participants were needed in order to obtain adequate power, or the probability of detecting an existing effect of mindfulness on the trauma exposure and PTSD relationship. Data collection over two semesters resulted in 236 participants in the current study. The observed *post hoc* power was η^2 =.72 and the observed effect sizes of mindfulness were small, Cohen's *d*=.2.

Descriptive Statistics

Participants used in the reported analyses were selected from the sample based on having endorsed experiencing one or more traumatic life events during which they "experienced intense fear, helplessness, or horror," referred to here as "trauma-exposed." A total of 65% (N=236, 160 female; 76 male) participants were thus selected from the original sample of 367 individuals for use in the current analyses. When asked specifically about traumatic responses involving intense fear, helplessness, or horror, trauma-exposed participants reported an average of 2.28 (range=1-10, *SD*=1.62) such experiences. Trauma exposed participants reported significantly more traumas at Time 1 (M=8.06, *SD*=6.95) than at Time 2 (M=5.17, *SD*=5.39; *t*=7.361, *p*=.00).

PTSD scores, a composite of all Criterion B, C, and D symptoms from the PSDS, ranged from 0-70. As expected, participants endorsing a trauma response including

intense fear, helplessness, or horror reported significantly higher Time 1 PTSD symptoms (M=14.70, *SD*=15.36) than non-trauma-exposed participants (M=3.69, *SD*=6.34; *t*=*-5.96*, *p*=.00). Trauma exposed participants reported significantly higher PTSD at Time 1 (M=14.45, *SD*=14.72) than at Time 2 (M=10.27, *SD*=15.15; *t*=4.453, *p*=.00). Although cut-off scores for diagnosing PTSD vary, scores above 18 on the PSDS generally indicate the presence of clinical levels of PTSD in samples of adults who have been physically or sexually assaulted. Thus, the average score of 15 on the PSDS likely reflects sub-diagnostic levels of PTSD in most of this trauma-exposed sample.

Mindfulness scores on the MAAS were stable over Time 1 and Time 2 (*t*=1.916, *p*=.06*)*. Scores ranged from 28-84 with a Time 1 mean of 55.55 (*SD*=10.42) and Time 2 mean of 54.48 (*SD*=10.24), consistent with other published studies using the MAAS with non-clinical samples (Cardaciotto, 2005). There were no systematic differences among trauma-exposed and non-exposed participants on Time 1 mindfulness scores (*t*=1.60, *p*=.11) or age (*t*=*-.90*, *p*=.37).

Gender Differences

There were no gender differences in self-reported frequency of exposure to traumatic life events at Time 1 or Time 2 (*t*=1.173, *p*=.24). In contrast, significantly more women (67%) than men (61%) endorsed a trauma response including intense fear, helplessness, or horror at Time 1 (*t*=-2.655, *p*=.008) and at Time 2 (*t*=-2.204, *p*=.03). Men were more likely to report exposure to accidents involving severe injury or death (*t*=3.965, *p*=.00), having a life threatening illness (*t*=2.563, *p*=.00), and physical assault (*t*=4.319, *p*=.00). Women were more likely to report a history of childhood or adult sexual abuse (*t*=-3.594, *p*=.00). There were no significant gender differences at Time 1

or Time 2 on scores of total PTSD symptoms (t=.121, p=.73; t=-.227, p=.85), in symptoms of avoidance (t=-.291, p=.56; t=-1.19, p=.36) or hyperarousal (t=.141, p=.41; t=-.88, p=.53). However, women reported higher reexperiencing symptoms than men at Time 1 (t=-2.017, p=.05) and Time 2 (t=-1.901, p=.05). There were no gender differences in dispositional mindfulness at Time 1 or Time 2 (t=1.044, p=.31).

Pearson correlation coefficients were computed among gender, trauma exposure, PTSD symptom clusters, and mindfulness at Time 1 and Time 2 and are summarized in Table 1. As expected, trauma frequency, trauma response, and PTSD symptoms (both total and subscale scores at Time 1 and Time 2) were all positively and significantly correlated (p<.05). Notably, mindfulness at Time 1 was negatively correlated with both trauma response (r=-.17, p<.05) and PTSD (r=-.24, p<.05) at Time 1. Mindfulness at Time 1 was also negatively correlated with each of the subscales of PTSD, reexperiencing (r=-.20, p<.05), avoidance (r=-.21, p<.05), and hyperarousal (r=-.24, p<.05) at Time 1. However, mindfulness at Time 1 was not significantly correlated with any Time 2 trauma or PTSD variables (p>.05)

As reported above, gender was significantly correlated with trauma response at Time 1 (r=.17, p<.05), with women reporting higher rates of trauma responses than men. Additionally, gender was significantly correlated with reexperiencing symptoms at both Time 1 (r=13, p<.05) and Time 2 (r=13, p<.05), with women reporting higher rates of reexperiencing symptoms than men.

Mindfulness as a moderator

All reported analyses include only participants reporting at least one trauma response. The first hypothesis predicted that higher dispositional mindfulness would predict subsequently lower trauma exposure (frequency or trauma response) over the 3-month interim. A regression analysis was utilized to test this hypothesis; however, these relationships were not supported by the data (β=-.07, p=*.36* and β=-.07, p=*.36,* respectively).

The second hypothesis predicted that the direct relationship between frequency of trauma exposure (as measured at Time 2) and PTSD symptoms (as measured at Time 2) would be moderated by Time 1 levels of mindfulness. Multiple regression analyses were conducted to test this hypothesis. Following recommendations by Cohen, Cohen, Aiken, and West (2003) the independent variables and proposed moderator variables were centered to reduce multicollinearity between interaction terms and their lower-order terms, as well as to account for scale invariance. Standardizing scores also allows for regression coefficients to be interpreted within the same metric.

Scores for trauma exposure and mindfulness were centered and interaction terms were calculated by obtaining the cross-products of the first order variable scores. PTSD was simultaneously regressed on mindfulness (Time 1), trauma exposure (Time 2), and the mindfulness X exposure product term (see Baron & Kenny, 1986). The standardized regression coefficient associated with the product term was non-significant (β=.05, p=.50), failing to support the moderation hypothesis. As further examination of the nature of the predicted prospective moderation was not indicated, no subsequent analyses of simple slopes were conducted. This analysis was repeated using each of the PTSD

subscales as the criterion variable with similar results. None were supported as moderator variables.

Mindfulness as a Mediator: Post-hoc Analyses

Based on the moderation analysis, mindfulness may not account for the *strength* of the relationship between trauma exposure and subsequent PTSD symptoms (as measured at the 3-month follow-up). However, given that there were significant correlations in the predicted directions among trauma exposure, PTSD symptoms, and mindfulness at Time 1 and since recent research suggests that mindfulness may instead be a mechanism mediating psychological problems (Follette, Palm, & Pearson, 2006), mediation was tested post-hoc. More specifically, it is possible that mindfulness is an intervening variable by which trauma exposure exerts influence on symptom development. Because mindfulness at Time 1 was not significantly correlated with trauma and PTSD at Time 2, all tests of mediation are on cross-sectional data. Correlations among trauma response and mindfulness are consistent across the total PTSD score and subscales of reexperiencing, avoidance, and hyperarousal symptoms for Time 1. Therefore, only total PTSD scores were used in the following analyses.

The mediating role of mindfulness in explaining the direct relationship between traumatic life experiences and total PTSD symptoms was tested using regression analyses (Cohen, Cohen, Aiken, & West, 2003). Following the four-step algorithm for testing mediation proposed by Kenny, Kashy, and Bolger (1998), in Step 1, the direct relationship between the predictor variable (trauma response) and the outcome variable (total PTSD symptoms; β=.40, p<.00) was confirmed. Next, the relationship between trauma response and the mediator (mindfulness) was established (β=-.17, p<.01). In Step

3, the relationship between the mindfulness and PTSD was tested (β=-.24, p<.00). Because gender was identified to be significantly related to trauma response, gender was included as a variable in the final step of the regression sequence. The final step was accomplished utilizing one regression analysis, such that PTSD served as the dependent variable and trauma response, mindfulness, and gender were entered simultaneously as independent variables. (Figure 2).

Partial mediation was found when, in the presence of mindfulness, the regression coefficient between trauma response and PTSD was reduced (β=.41, p<.00 to β=.37 p<.01). The significance of this reduction was confirmed using the Sobel test (t=-3.26, p=.00; Preacher & Leondardelli, 2001). There was a non-significant regression coefficient associated with the gender variable β=-.01, p<.96) Regression analyses supported the hypothesis that dispositional mindfulness partially mediates the relationship between trauma exposure and PTSD symptoms, even when controlling for gender. (Figure 2).

CHAPTER 4

DISCUSSION

Primary Hypotheses

The purpose of this study was to examine the role of mindfulness in the development of PTSD symptoms among men and women following exposure to traumatic life events. The initial set of analyses addressed the first hypothesis that mindfulness would predict trauma exposure assessed at the three-month follow-up. The data from this prospective study do not support the first hypothesis based on analyses of general trauma exposure and response. These results, however, do support the well-established relationship between trauma exposure and PTSD symptoms, in both cross-sectional and longitudinal analyses. The finding that mindfulness was negatively related to trauma exposure at Time 1 but not Time 2 warrants further consideration.

It was further expected that mindfulness would serve a moderating role in the relationship between trauma exposure and posttraumatic stress that occurred during the three months between Time 1 and Time 2 assessments. This hypothesis was also not supported by the data. It appears that different levels of mindfulness do not exert a direct influence on the acute trauma exposure-PTSD symptom relationship. However, several limitations should be noted. At Time 2, participants were expected to report traumas occurring in the three months since Time 1. Based on the high correlation (r=.69, p<.05) between Time 1 and Time 2 exposures, participants appeared to respond inconsistently to queries of trauma experienced in the previous three months. Instructions may have lacked

clarity as some participants seemed to interpret the Time 2 trauma exposure questions to mean a cumulative number of lifetime traumas while others seemed to interpret the question to mean the number of traumas since Time 1. This inconsistency constrains the interpretation of these results.

Gender Differences

Men and women reported similar cumulative frequencies of exposure to traumatic life events. However, women reported significantly higher rates of events that provoked strong emotional responses including intense fear, helplessness, or horror. These findings could be related to gender differences in types of trauma or in cognitive appraisal in which women are more likely to report higher perceived distress in terms of loss of personal control (see Olff, Langeland, Draijer, & Gersons, 2007 for review). Men reported higher rates of serious accidents, illnesses, and physical assaults, while women reported higher rates of sexual assault, which is consistent with previous research (Kubany et al., 2000).

Reports of gender differences in PTSD vary across a range of traumas (Kessler et al., 1995; Olff et al., 2007). The current study revealed no significant differences in gender on total PTSD symptoms, or on avoidance and hyperarousal subscales. However, women reported higher reexperiencing symptoms than men at both Time 1 and 2, including intrusive thoughts or images of the traumatic event, nightmares, and flashbacks of the event, which may be related to the uniquely intrusive nature of sexual assault.

These gender differences may be noteworthy when considering more specifically the development of reexperiencing symptoms, which are “non-present-moment-oriented” by the nature of the past intruding on the present. There are no reports of gender

differences in mindfulness nor were any observed in this study. Nonetheless, it remains important for researchers to continue examining the role of gender in developing comprehensive models for explaining posttraumatic adjustment.

Post Hoc Analyses

Based on recent research suggesting that mindfulness may be a mechanism mediating psychological problems (Follette et al., 2006), it was speculated that perhaps mindfulness was an intervening variable by which trauma exposure exerts influence on symptom development. Considering the potential role that dispositional mindfulness may play in explaining the relationship between trauma exposure and posttraumatic stress, these analyses yielded relevant findings. Although mindfulness was not found to exert a moderating effect on the relationship between trauma exposure and PTSD, mindfulness was a significant mediator of this relationship.

Due to non-significant correlations among mindfulness at Time 1 and trauma variables assessed at three-month follow-up (Time 2), tests of mediation could only be performed on cross-sectional data. Nonetheless, results support the speculation that dispositional mindfulness may play a significant role in mitigating psychological distress following trauma exposure in a sample of college students. The present moment, non-judgmental stance that is the essence of mindfulness can promote positive post-trauma adjustment, or vice versa. Further prospective data are needed to test this relationship.

Limitations of Study

Participants reported significantly lower rates of trauma exposure and PTSD symptoms at Time 2 than at Time 1. This decrease in exposure and symptoms can

translate into non-significant correlations among study variables and non-significant regression coefficients for the moderation product term.

These data suggest that assessing trauma exposure, PTSD symptoms, and mindfulness simultaneously reveals significant relationships among the variables as expected that were not captured in the longitudinal design. It seems possible to consider that the construct of mindfulness as measured by the MAAS is not associated with traumatic events reported three months later as previously conceptualized. Perhaps by the nature of mindfulness being a present-oriented stance, and traumatic life experiences being largely unavoidable, it is reasonable to observe a non-significant role of mindfulness in predicting future trauma. Future research is needed, however, to elucidate more clearly the temporal nature of these relationships.

It is feasible that a real effect of mindfulness on the trauma exposure-posttraumatic adjustment was not captured, resulting in a Type II error. There may be problems associated with early developments in the measurement and interpretation of mindfulness as a construct (Brown & Ryan, 2003; Cardaciotto, 2005). While this study observed statistically non-significant relationships among Time 1 mindfulness and Time 2 trauma exposure and PTSD symptoms, it remains a theoretical relationship worthy of developing with stronger assessment and design techniques.

The tests of mediation were performed on cross-sectional data due to the non-significant correlations among the Time 1 and Time 2 variables; therefore, conservative assertions are made regarding temporal and causal relationships among the variables. Several confounding variables (e.g., subjective labeling of traumatic events, time since assault, dissociation) may have also influenced results. As is typical in studies drawing

from university samples of convenience, these findings may not be generalizable to other populations (e.g., ethnically diverse, elderly, children). Finally, it is important to recognize the limitations of self-report data particularly with regard to disclosure of traumatic events.

While the design of this study was longitudinal, conclusions based on these results are limited due to the non-significant relationships between mindfulness and trauma variables assessed at three month follow-up. Nonetheless, the results do raise the possibility that more mindful individuals may draw on these practices in responding to current symptoms of PTSD. Prospective studies will elucidate the dynamic interplay between pre-trauma levels of dispositional mindfulness and post-trauma adjustment. These longitudinal and prospective studies will be essential for developing comprehensive trauma prevention and treatment programs.

Strengths of Study, Potential Treatment Implications, and Future Directions

Despite methodological limitations, the current study is one of the first to specifically measure the relationships among exposure to traumatic life events involving an emotional response of intense fear, helplessness, or horror, PTSD symptoms, and dispositional mindfulness. Strengths include a large sample size and well-established measures of trauma exposure and PTSD symptoms. This study is also one of the first to include measures of mindfulness in accounting for the relationship among trauma variables. Future research will be strengthened by prospective designs to confirm causal relationships in symptom development. Larger and more diverse samples of trauma exposed adults will allow for closer examination of the influence of type, frequency, and

severity of exposure. Closer examination of gender differences in subjective labeling of traumatic life events, posttraumatic adjustment, and mindfulness is clearly needed.

In terms of research on mindfulness, Brown and Ryan (2004) have commented on the utility of integrating empirical findings across disciplines to further the applications of basic research. This study found support for mindfulness as a mediator in the relationship between trauma exposure and posttraumatic stress symptoms. These findings are consistent with other researchers who have proposed that mindfulness is one of the underlying mechanisms by which psychological adjustment is mediated (Shapiro et al., 2006). It has been suggested that mindfulness provides meta-cognitive awareness that allows distressed individuals to alter how they process and narrate their thoughts and emotions (Hayes, 2005; Wells, 2006).

Specifically, mindfulness may particularly target symptoms associated with reexperiencing the trauma (criteria B). Intrusive thoughts, flashbacks, and distressing reminders of the traumas can reinforce a past-oriented stance related to high negative emotional valence of the symptoms. By contrast, if individuals are more fully aware of the present moment (often referred to as "grounded") by practicing mindfulness, they may be more apt to interpret the situation accurately. They may be better able to attend to internal and external cues that may be triggering and then reinforcing symptoms. They can then practice and employ symptom management skills including breathing exercises, progressive muscle relaxation, containment, and other distress-tolerance strategies. When reexperiencing symptoms are successfully averted, survivors may begin to develop a sense of control over themselves and their environment (Frazier, Mortenson, & Steward, 2005). Given the observed gender differences in reexperiencing symptoms, it is important

to consider how men and women may vary in the ways they remember the traumatic event. Women may need a varied form of assistance in coping with these intrusive symptoms.

Experiential avoidance has been implicated in the development and maintenance of PTSD symptoms (Batten, Orsillo, & Walser, 2005) and dissociation is a form of persistent avoidant coping. Gaining an increased sense of personal control could help decrease symptoms of avoidance (criteria C). With the increasing ability to tolerate and discriminate benign from harmful triggers, survivors could slowly regain access to thoughts, activities, places, and people that were once avoided for fear of becoming "flooded" or re-traumatized. In this sense, mindfulness could tentatively be considered as an antidote for experiential avoidance that constitutes, or contributes to, cluster C symptoms.

Finally, mindfulness encourages specific attention to internal cues. Individuals begin to notice their breath, body sensation, thoughts and feelings. They can learn to identify signs of distress and hyperarousal (criteria D) and can begin the process of discriminating true danger from tenuous stimuli. When clients learn to notice signs of their physiological hyperarousal, they can then employ techniques they have learned to induce relaxation responses to manage physical discomfort. The non-judgmental component of mindfulness could allow participants to practice skills without undue self-criticism for their plight. The aforementioned conceptualizations of mindfulness, as applied to clusters of PTSD symptoms, are primarily theoretical in nature, with recently emerging empirical evidence for the theory.

A variety of new constructs have been identified as potential active ingredients to account for the potency of mindfulness-based interventions. Intention, Attention, and Attitude are three mechanisms of mindfulness proposed by Shapiro and colleagues (2006). More specifically, they discussed the facets of "reperceiving," "decentering," "deautomazation," and "detachment" as core aspects of these theories. Affect regulation is considered to be an important component in many mindfulness-based interventions. These types of emotion regulation skills, which are essentially mindfulness, teach ways to experience distress without emotional avoidance and with the ability to then employ active coping techniques. Evidence is mounting that anxiety mood states can be regulated with mindfulness practices (Batten et al., 2005).

What are the practical considerations of extending these findings in future research for the field of psychology and psychotherapy? Effective mindfulness-based interventions are being developed to decrease PTSD and dissociative symptoms (Batten et al., 2005; Briere, 2006; Wagner & Linehan, 2006). Professionals seeking empirically based literature to address the specialized needs of traumatized clients may find additional support for using mindfulness-based treatments. Psychotherapists may also more confidently incorporate mindfulness practices into their repertoire of clinical interventions, knowing there is mounting empirical evidence to support the efficacy of the practices.

The body of literature on trauma and mindfulness is largely theoretical and future work in this area could apply dismantling and component designs in order to determine the most effective mechanisms of mindfulness interventions (Lynch, Chapman, Rosenthal, Kuo, & Linehan, 2006). It is theoretically plausible that the same mindfulness

components which decrease psychological distress such as anxiety and depression may also decrease PTSD symptoms, yet that question awaits future empirical investigation. These studies would require larger and more diverse samples, and would be of great interest to increase understanding of the active mechanisms by which trauma and adjustment may be mediated.

Research over the past several decades has continued to document the endemic nature of trauma exposure and the deleterious consequences it can incur. Results from this study provide preliminary data to suggest that dispositional mindfulness may serve as a protective factor for developing PTSD following exposure to a traumatic event, and these data call for future empirical inquiry. Given the findings and theories addressed previously, it stands to reason that mindfulness practices may be useful in adapting to a range of traumatic life events. Clinical scientists interested in creating more complex models of posttraumatic syndromes would appropriately consider and study the role of dissociation, which could be considered part of the spectrum of attentional awareness on which mindfulness lies. There is a need for improved research designs that capture longitudinal changes in trauma exposure and PTSD that may vary as a function of mindfulness and dissociation. Future research recommendations derived from this project include clinical trials assessing mindfulness-based interventions for trauma-related syndromes and identifying mechanisms by which these interventions reduce risk for developing post-trauma symptoms. Prospective studies and continued integration of clinical theory and practice will be essential for developing comprehensive trauma prevention and treatment programs.

REFERENCES

Albers, S. (2003). *Eating Mindfully: How to End Mindless Eating and Enjoy a Balanced Relationship with Food.* Oakland, CA: New Harbinger Publications, Inc.

American Psychiatric Association (1994). *Diagnostic and Statistical Manual of Mental Disorders, 4th Edition.* Washington, D. C.: APA.

Baer, R. (2003). Mindfulness training as a clinical intervention: A conceptual and empirical review. *Clinical Psychology: Science and Practice, 10,* 125-143.

Baer, R. (2004). *Mindfulness Based Cognitive Therapy for Binge Eating: 8-week group therapy protocol manual.* Unpublished manuscript, University of Kentucky.

Baer, R. A., Fischer, S., & Huss, D. B. (2006). Mindfulness and acceptance in the treatment of disordered eating. *Journal of Rational-Emotive and Cognitive-Behavior Therapy, 24,* 281-300.

Baer, R. A., Smith, G. T., Jopkins, J., Krietemeyer, J., Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment*, *13,* 27-45.

Barlow, D. H. (2001). *Clinical Handbook of Psychological Disorders (3rd Ed.).* New York: Guilford Press.

Baron, R. M. & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51(6),* 1173-1182.

Batten, S. V., Orsillo, S. M., & Walser, R. D. (2005) Acceptance and mindfulness-based approaches to the treatment of posttraumatic stress disorder. In S. M. Orsillo & L.

Roemer (Eds.), *Acceptance and mindfulness-based approaches to anxiety: Conceptualization and Treatment* (pp. 241-270). Springer Science+Business Media, Inc.: New York.

Becker, C. B., & Zayfert, C. (2001). Integrating DBT-based techniques and concepts to facilitate exposure treatment for PTSD. *Cognitive and Behavioral Practice, 8,* 107-122.

Bishop, S. R., Lau, M., Shapiro, S., Carlson, L., Anderson, N. D., Carmody, J., Segal, Z., et al. (2004). Mindfulness: A proposed operational definition. *Clinical Psychology: Science and Practice*, *11(3)*, 230-241.

Bowen, S., Wiktiewitz, K., Dillworth, T. M., Chawla, N., Simpson, T. L., Ostafin, B. D., Larimer, M. E., Blume, A. W., Parks, G. A., & Marlatt, G. A. (2006). Mindfulness meditation and substance use in an incarcerated population. *Psychology of Addictive Behavior, 20(3)*, 343-347.

Breslau, R., Kessler, R. C., Chilcoat, H. D., Schultz, L. R., Davis, G. C., & Andreski, P. (1998). Trauma and posttraumatic stress disorder in the community: The 1996 Detroit area survey of trauma. *Archives of General Psychiatry, 55,* 626-632.

Briere, J. (2006). Dissociative symptoms and trauma exposure: Specificity, affect dysregulation, and posttraumatic stress. *Journal of Nervous and Mental Disease, 194 (2),* 78-82.

Briere, J., Weathers, F. W., & Runtz, M. (2005). Is dissociation a multidimensional construct? Data from the Multiscale Dissociation Inventory. *Journal of Traumatic Stress, 18(3),* 221-231.

Brown, K. W. & Ryan, R. M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology, 84(4),* 822-848.

Brown, K. W. & Ryan, R. M. (2004). Perils and promise in defining and measuring mindfulness: Observations from experience. *Clinical Psychology: Science and Practice*, *11(3)*, 242-248.

Calhoun, K. S., & Atkeson, B. M. (1991). *Treatment of Rape Victims: Facilitating Psychosocial Adjustment.* Pergamon: New York.

Calhoun, K. S., Gidycz, C., Michels, K. T., Hammond, C., & McCauley, J. (2004) Sexual revictimization, dissociation, and PTSD. Poster presented at the 24th Annual Convention of the Anxiety Disorders Association of America, Miami.

Cardaciotto, L. (2005). *Assessing mindfulness: The development of a bi-dimensional measure of awareness and acceptance.* Unpublished doctoral dissertation, Drexel University.

Carlson, L., & Brown, K. W. (2005). Validation of the Mindful Attention Awareness Scale in a cancer population. *Journal of Psychosomatic Research, 58,* 29-34.

Carson, J. W., Carson, K. M., Gil, K. M., & Baucom, D. H. (2004). Mindfulness-based relationship enhancement. *Behavior Therapy, 35,* 471-494.

Chambless, D. L., & Hollon, S. D. (1998). Defining empirically supported therapies. *Journal of Consulting and Clinical Psychology, 66,* 7-18.

Clark, D. M., Ball, S., & Pape, D. (1991). An experimental investigation of thought suppression. *Behaviour Research and Therapy, 29(3),* 253-257.

Cohen, J., Cohen, P., Aiken, S. G., & West, A. L. (2003). *Applied Multiple Regression / Correlation Analysis for the Behavioral Sciences.* Mahwah, NJ: Erlbaum.

Ehlers, A. (2006). More evidence for the role of persistent dissociation in PTSD. *American Journal of Psychiatry, 163(6),* 1112-1113.

Finucane, A. & Stewart, M. (2006). An exploratory mixed methods study of the acceptability and effectiveness of mindfulness-based cognitive therapy for patients with active depression and anxiety in primary care. *BioMed Central Psychiatry, 6,* 16-30.

Foa, E. B. & Rothbaum, B. O. (1998). *Treating the Trauma of Rape: Cognitive-Behavioral Therapy for PTSD*. New York: Guilford Press.

Follette, V. M., Palm, K. M., & Rasmussen Hall, M. L. (2004). Acceptance, mindfulness, and trauma. In S. C. Hayes, V. M. Follette, & M. M. Linehan (Eds.), *Mindfulness and Acceptance: Expanding the Cognitive-Behavioral Tradition* (pp. 192-208) New York: Guilford Press.

Follette, V. M., Palm, K. M., & Pearson, A. N. (2006). Mindfulness and trauma: Implications for treatment. *Journal of Rational-Emotive & Cognitive-Behavior Therapy, 24,* 45-61.

Follette, V. M., & Ruzek, J I. (2006). *Cognitive-Behavioral Therapies for Trauma (2nd ed.).* New York: Guildford Press.

Frazier, P.A., Mortensen, H., & Steward, J. (2005). Coping strategies as mediators of the relations among perceived control and distress in sexual assault survivors. *Journal of Counseling Psychology, 52(3),* 267-278.

Gabriel, K. T., Calhoun, K. S., Hartzell, E., Michels, L. C., Taylor, M., & Pollard, A. (2007). Does mindfulness mediate the relationship between sexual trauma and PTSD? Paper presented at 54th Annual Convention of the Southeastern Psychological Association, New Orleans.

Gabriel, K.T., Edwards, K., Salstrom, S., Spears, J., & Panico, R. (2006). Teaching Therapeutic Yoga to Medical Outpatients: Practice Descriptions, Process Reflections, and Preliminary Outcomes, *International Journal of Yoga Therapy, 16,* 59-66.

Hanh, T. N. (1975). *The Miracle of Mindfulness.* Boston: Beacon Press.

Hahn, T. N. (1990). *Our Appointment with Life: The Buddha's Teaching on Living in the Present.* Berkeley: Parallax Press.

Halligan, S. L., Michael, T., Clark, D. M., & Ehlers, A. (2003). Posttraumatic stress disorder following assault: The role of cognitive processing, trauma memory, and appraisals. *Journal of Consulting and Clinical Psychology, 71(3),* 419-431.

Harris, S. & Laskin, B. (2004). Bringing mindfulness awareness practice to the experience of childhood sexual abuse and trauma. *Peel Committee on Sexual Abuse E-ZINE, 1,* 3-4.

Hayes, S. C. (2005). Acceptance and commitment therapy, relational frame theory, and the third wave of behavioral and cognitive therapies. *Behavior Therapy, 35,* 639-665.

Hayes, S. C., Follette, V. M., & Linehan, M. M. (2004). *Mindfulness and Acceptance: Expanding the Cognitive-Behavioral Tradition.* New York: Guilford Press.

Hayes, S.C, Strosahl, K. D., & Wilson, K. G. (1999). *Acceptance and Commitment Therapy: An Experiential Approach to Behavior Change.* New York: Guilford Press.

Hayes, S. C., Wilson, K. G., Gifford, E. V., Follette, V. M., & Strosahl, K. D. (1996). Experiential avoidance and behavioral disorders: A functional dimensional approach to diagnosis and treatment. *Journal of Consulting and Clinical Psychology*, *64(6)*, 1152-1168.

Kabat-Zinn, J. (1988). Compliance with an outpatient stress reduction program: Rates and predictors of program completion. *Journal of Behavioral Medicine*, 11, 333-352.

Kabat-Zinn, J. (1990). *Full Catastrophe Living: Using the Wisdom of Your Body and Mind to Face Stress, Pain, and Illness*. New York: Dell.

Kabat-Zinn, J. (1994). *Wherever you go, there you are: Mindfulness meditation in everyday life*. New York: Hyperion.

Kabat-Zinn, J. (2005). *Coming to Our Senses: Healing Ourselves and the World through Mindfulness.* New York: Hyperion.

Kabat-Zinn, J., Lipworth, L., & Burney, R. (1985). The clinical use of mindfulness meditation for the self-regulation of chronic pain. *Journal of Behavioral Medicine, 8(2),* 163-190.

Kabat-Zinn, J., Massion, A. O., Kristeller, J., Peterson, L. G., Fletcher, K. E., Pbert, L., et al. (1992). Effectiveness of a meditation-based stress reduction program in the treatment of anxiety disorders. *American Journal of Psychiatry, 149(7),* 936-943.

Kenny, D.A., Kashy, D.A., & Bolger, N. (1998). Data analysis in social psychology. In D.T. Gilbert, S.T. Fiske, & G. Lindzey (Eds.)*, The handbook of social psychology*, (4th ed., Vol. 2, pp.233-265). New York: McGraw-Hill.

Kessler, R. C., Sonnega, A., Bromet, E., Hughes, M., & Nelson, C. B. (1995). Posttraumatic stress disorder in the National Comorbidity Survey. *Archives of General Psychiatry*, *52,* 1084-1060.

Kilpatrick, D. G., Edmunds, C. N., & Seymour, A. K. (1992). *Rape in America: A Report to the Nation.* Arlington, VA: National Victim Center and Medical University of South Carolina.

King, D. W., King, L. A., Foy, D. W., Keane, T. M., & Fairbank, J. A. (1999). Posttraumatic stress disorder in a national sample of female and male Vietnam veterans: Risk factors, war-zone stressors, and resilience-recovery variables. *Journal of Abnormal Psychology*, *198(1),* 164-170.

Kisiel, C. L., & Lyons, J. S. (2001). Dissociation as a mediator of psychopathology among sexually abused children and adolescents. *American Journal of Psychiatry, 158(7), 1034-1039.*

Koss, M. P. & Figueredo, A. J. (2004). Change in cognitive mediators of rape's impact on psychosocial health across 2 years of recovery. *Journal of Consulting and Clinicial Psychology, 72(6)*, 1063-1072.

Kristeller, J. L., & Hallett, B. (1999). An exploratory study of a meditation-based intervention for binge eating disorder. *Journal of Health Psychology, 4(3),* 357-363.

Kubany, E. S., Leisen, M. B., Kaplan, A. S., Watson, S. B., & Hughes, S. N. (2000). Development and preliminary validation of a brief broad-spectrum measure of trauma exposure: The traumatic life events questionnaire. *Psychological Assessment*, *12(2),* 210-224.

Kubany, E. S., Leisen, M. B., Kaplan, A. S., & Kelly M. (2000). Validation of a brief measure of posttraumatic stress disorder: The Distressing Events Questionnaire. *Psychological Assessment*, *12(2),* 197-209.

Kulka, R. A., Schlenger, W. E., Fairbank, J. A., Hough, R. L., Jordan, B.K., Marmar, C.R., et al. (1990). *Trauma and the Vietnam War Generation: Report on the Findings from the National Vietnam Veterans Readjustment Study*. New York: Brunner/Mazel.

Langer, E. (1989). *Mindfulness.* Cambridge, MA: Da Capo Press.

Linehan, M. M. (1993a). *Cognitive-Behavioral Treatment of Borderline Personality Disorder.* New York: Guilford Press.

Linehan, M. M. (1993b). *Skills Training Manual for Treating Borderline Personality Disorder*. New York: Guilford Press.

Linehan, M. M., Armstrong, H. E., Suarez, A., Allmon, D., & Heard, H. L. (1991). Cognitive-behavioral treatment of chronically parasuicidal borderline patients. *Archives of General Psychiatry, 48*, 1060-1064.

Lynch, T. R., Chapman, A. L., Rosenthal, M. Z., Kuo, J. R., & Linehan, M. M. (2006). Mechanisms of change in Dialectical Behavior Therapy: Theoretical and empirical observations. *Journal of Clinical Psychology, 62(4)*, 459-480.

Ma, H. S. & Teasdale, J. D. (2004). Mindfulness-based cognitive therapy for depression: Replication and exploration of different relapse preventative effects. *Journal of Consulting and Clinical Psychology, 72(1),* 31-40.

Marlatt, G. A. (1998). *Harm Reduction: Pragmatic Strategies for Managing High-Risk Behaviors.* New York: Guilford Press.

Malatt, G. A., & Donovan, D. M. (2005). *Relapse Prevention: Maintenance Strategies in the Treatment of Addictive Behavior*. New York: Guilford Press.

Marlatt, G. A., Witkiewitz, K., Dillworth, T. M., Bowen, S. W., Parks, G. A., Macpherson, L., et al. (2004). Vispassana meditation as a treatment for alcohol and drug use disorders. In S. C. Hayes, V. M. Follette, & M. M. Linehan (Eds.), *Mindfulness and Acceptance: Expanding the Cognitive-Behavioral Tradition* (pp. 261-287) New York: Guilford Press.

Massion, A. O., Teas, J., Herbert, J. R., Wertheimer, M. D., & Kabat-Zinn, J. (1995). Meditation, melatonin, and breast/prostate cancer: Hypothesis and preliminary data. *Medical Hypotheses, 44,* 39-46.

Messman-Moore, T.L., Long, P.J., & Siegfried, N.J. (2000). The revictimization of child sexual abuse survivors: An examination of the adjustment of college women with child sexual abuse, adult sexual assault, and adult physical abuse. *Journal of the American Professional Society on the Abuse of Children, 5(1),* 18-27.

Miller, J. J., Fletcher, K., & Kabat-Zinn, J. (1995). Three-year follow-up and clinical implications of a mindfulness meditation-based stress reduction intervention in the treatment of anxiety disorders. *General Hospital Psychiatry*, *17,* 192-200.

Nolen-Hoeksema, S. (2000). The role of rumination in depressive disorders and mixed anxiety/depressive symptoms. *Journal of Abnormal Psychology, 109(3),* 504-511.

Olff, M.., Langeland, W., Draijer, N., & Fersons, B. P. R. (2007). Gender differences in posttraumatic stress disorder. *Psychological Bulletin, 133(2),* 183-204.

Orsillo, S. M., Roemer, L., & Holowka, D. W. (2005). Acceptance-based behavioral therapies for anxiety: Using acceptance and mindfulness to enhance traditional cognitive-behavioral approaches. In S. M. Orsillo & L. Roemer (Eds.). *Acceptance and Mindfulness-Based Approaches to Anxiety: Conceptualization and Treatment.* New York: Springer.

Ott, M. J., Norris, R. L., & Bauer-Wu, S. M. (2006). Mindfulness meditation for oncology patients: A discussion and critical review. *Integrative Cancer Therapies, 5,* 98-108.

Ozer, E. J., Best, S. R., Lipsey, T. L., & Weiss, D. S. (2003). Predictors of posttraumatic stress disorder and symptoms in adults: A meta-analysis. *Psychological Bulletin, 129(1),* 52-73.

Preacher, K.J., & Leonardelli, G.J. (2001, March). Calculation for the Sobel test: An interactive calculation tool for mediation tests [Computer software].

Putnam, F. W., Carlson, E. B. & Ross, C. A. (1996). Patterns of dissociation in clinical and nonclinical samples. *Journal of Nervous and Mental Disease, 184(11),* 673-679.

Resick, P. A. (2001). Cognitive therapy for posttraumatic stress disorder. *Journal of Cognitive Psychotherapy, 15,* 321-329.

Resnick, H. S., Kilpatrick, D. G., Dansky, B. S., Saunders, B. E., & Best, C. L. (1993). Prevalence of civilian trauma and posttraumatic stress disorder in a representative national sample of women. *Journal of Consulting and Clinical Psychology, 61*, 984-991.

Roemer, L., & Orsillo, S. M. (2002). Expanding our conceptualization of and treatment for generalized anxiety disorder: Integrating mindfulness/acceptance-based approaches with existing cognitive-behavioral models. *Clinical Psychology: Science and Practice*, *9,* 54-68.

Sachs-Ericsson, N., Blazer, D., Plant, E. A., & Arnow, B. (2005). Childhood sexual and physical abuse and the 1-year prevalence of medical problems in the National Comorbidity Survey. *Health Psychology, 24,* 32-40.

Segal, Z. V., Williams, J. M. G., & Teasdale, J. D. (2002). *Mindfulness-Based Cognitive Therapy for Depression: A New Approach to Preventing Relapse.* New York: Guilford Press.

Shapiro, S. L., Carlson, L. E., Astin, J. A., & Freedman, B. (2006). Mechanisms of mindfulness. *Journal of Clinical Psychology, 62(3),* 373-386.

Spiegel, D., & Cardeña, E. (1991). Disintegrated experience: The dissociative disorders revisited. *Journal of Abnormal Psychology, 100(3),* 366-378.

Strosahl, K. D., Hayes, S. C., Bergan, J., & Romano, P. (1998). Assessing the field effectiveness of acceptance and commitment therapy: An example of the manipulated training research method. *Behavior Therapy, 29*, 35-64.

Suzuki, S. (1973). *Zen Mind, Beginner's Mind.* San Francisco: Shambhala Publications, Inc.

Tacon, A. M., Caldera, Y. M., & Ronaghan, C. (2004). Mindfulness-based stress reduction in women with breast cancer. *Families, Systems, & Health, 22(2),* 193-203.

Teasdale, J. D., Segal, Z. V., & Williams, J. M. G. (1995). How does cognitive therapy prevent depressive relapse and why should intentional control (mindfulness) training help? *Behavior Research and Therapy., 33(1),* 25-39.

Teasdale, J. D., Segal, Z. V., & Williams, J. M. G. (2003). Mindfulness training and problem formulation. *Clinical Psychology: Science and Practice, 10,* 157-160.

Teasdale, J. D., Segal, Z. V., Williams, J. M. G., Ridgeway, V. A., Soulsby, J. M., & Lau, M. A. (2000). Prevention of relapse/recurrence in major depression by mindfulness-based cognitive therapy. *Journal of Consulting and Clinical Psychology*, 68(4), *615-623*.

Wagner, A. W., & Linehan, M. M. (2006). Dissociative Behavior. In V. M. Follette, & J. I. Ruzek, J I. *Cognitive-Behavioral Therapies for Trauma (2nd ed.).* New York: Guildford Press.

Wells, A. (2006). Detached mindfulness in cognitive therapy: A metacognitive analysis and ten techniques. *Journal of Rational-Emotive and Cognitive-Behavior Therapy, 23 (4),* 337-355.

Williams, J. M. G., Duggan, D. S., Crane, C., & Fennell, M. J. V. (2006). Mindfulness-based cognitive therapy for prevention of recurrence of suicidal behavior. *Journal of Clinical Psychology, 62(2),* 201-210.

Wiser, S. & Telch, C. F. (1999). Dialectical Behavior Therapy for binge eating disorder. *Psychotherapy in Practice, 55(6),* 755-768.

Witkiewitz, K., Marlatt, G. A., & Walker, D. (2005). Mindfulness-based relapse prevention for alcohol and substance use disorders. *Journal of Cognitive Psychotherapy, 19(3),* 211-228.

Wolfsdorf, B. A. & Zlotnick, C. (2001). Affect management in group therapy for women with posttraumatic stress disorder and histories of childhood sexual abuse. *Journal of Clinical Psychology*, *57(2),* 169-181.

Zettle, R. D., & Hayes, S. C. (1986). Dysfunctional control by client verbal behavior: The context of reason giving. *The Analysis of Verbal Behavior, 4*, 30-38.

Zettle, R. D., & Raines, J. C. (1989). Group cognitive and contextual therapies in treatment of depression. *Journal of Clinical Psychology, 45*, 438-445.

Table 1
Correlations among study variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Gender	---														
2. T1 Trauma Frequency[1]	.08	---													
3. T1 Trauma Response[1]	.17*	.63*	---												
4. T1 PTSD Total[2]	.07	.39*	.41*	---											
5. T1 PTSD Reexperiencing[2]	.13*	.33*	.37*	.88*	---										
6. T1 PTSD Avoidance[2]	.02	.35*	.36*	.93*	.75*	---									
7. T1 PTSD Hyperarousal[2]	-.03	.39*	.39*	.85*	.62*	.76*	---								
8. T1 Mindfulness[3]	-.04	-.05	-.17*	-.24*	-.20*	-.21*	-.24*	---							
9. T2 Trauma Frequency[1]	-.03	.69*	.53*	.25*	.21*	.24*	.25*	-.07	---						
10. T2 Trauma Response[1]	.12	.43*	.55*	.23*	.24*	.16*	.18*	-.08	.59*	---					
11. T2 PTSD Total[2]	.11	.35*	.28*	.59*	.56*	.49*	.50*	-.09	.33*	.46*	---				
12. T2 PTSD Reexperiencing[2]	.13*	.25*	.22*	.53*	.56*	.39*	.45*	-.07	.23*	.39*	.87*	---			
13. T2 PTSD Avoidance[2]	.08	.35*	.25*	.56*	.52*	.49*	.45*	-.05	.31*	.44*	.96*	.76*	---		
14. T2 PTSD Hyperarousal[2]	.06	.38*	.29*	.56*	.50*	.47*	.54*	-.11	.35*	.42*	.93*	.71*	.88*	---	
15. T2 Mindfulness[3]	.02	.01	-.08	-.15*	-.13	-.12	-.20*	.60*	-.08	-.07	-.18*	-.14*	-.16*	-.23*	---

Note: N=236; [1]Traumatic Life Events Questionnaire; [2]Posttraumatic Stress Diagnostic Scale; [3]Mindful Attention and Awareness Scale; *p<.05

Figure 1

Model of mindfulness mediating the relationship between trauma exposure and total PTSD symptoms in a sample of university men and women (N=236, *p<.05)