# Mindfulness as a Predictor of Posttraumatic Stress Disorder Symptomatology in an Experiential Avoidance Model

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MINDFULNESS AS A PREDICTOR OF POSTTRAUMATIC STRESS DISORDER

SYMPTOMATOLOGY IN AN EXPERIENTIAL AVOIDANCE MODEL

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Mindfulness as a Predictor of Posttraumatic Stress Disorder Symptomatology In an Experiential

Avoidance Model

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Abstract Content:
   The purpose of this study was to examine the ability of measures of mindfulness to predict the variance of posttraumatic stress disorder (PTSD) avoidance symptom severity above and beyond measures of experiential avoidance. A sample of 378 introductory psychology students completed questionnaire packets in individuals rooms to insure confidentiality of sensitive material. Based on a pencil-and-paper self-report measure of PTSD symptoms, the sample was divided into 3 groups: *PTSD* group ($n = 44$); *trauma-no PTSD* ($n = 147$); and a *control* (no trauma) group ($n = 123$). A fourth *traumatized* group was subsequently created consisting of individuals who endorsed a criterion A trauma, but who may or may not meet full PTSD criteria. Experiential avoidance measures of alexithymia and thought suppression were the most robust predictors of PTSD avoidance symptom severity, but mindfulness predicted more individual variance than measures of emotional coping, emotional intelligence, and a general measure of experiential avoidance. Although not as a strong a predictor of PTSD avoidance symptomatology as alexithymia and thought suppression, mindfulness appears to uniquely account for a significant amount of the variance of PTSD avoidance symptom severity. Treatment implications are discussed.

Acknowledgements

I would like to thank my parents for their unconditional support and approval throughout my school and life in general. Perhaps the greatest evidence of their trust in me was their willingness to hold their tongues when I announced that I would be attending a Buddhist-influenced Master's program. And it is with great relief that I can justifiably say that I have vindicated that trust to some degree in these pages.

I would be remiss if I did not thank my advisor, Jennifer Waltz, Ph.D., for her sound advice and guidance throughout my four years at the University of Montana. I've found I could always trust her judgment, and that I could take comfort that, when entering into new territory, I was doing so with her stamp of approval.

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Introduction

Posttraumatic stress disorder (PTSD) involves a cluster of symptoms that arise following exposure to a traumatic event. Of the three symptom clusters (e.g., reexperiencing, avoidance, hyperarousal), research suggests that avoidance symptoms are the most characteristic of PTSD (see Nemeroff et al., 2006), and that they appear to be most predictive of overall PTSD symptom severity (Boeschen, Koss, Figuerdo, & Coan, 2001; Marshall et al., 2006; Marx & Sloan, 2005; Orcutt, Pickett, & Pope, 2005; Plumb, Orsillo, and Luterek, 2004). Recent behavioral literature has focused on the use of avoidance strategies that are referred to under the umbrella term as *experiential avoidance*. Experiential avoidance refers to the use of strategies by individuals that involve actively avoiding experiences such as thoughts, physical sensations, and emotions (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). Experiential avoidance is believed to underlie several psychopathological conditions such as substance abuse, obsessive-compulsive disorder, and, the focus of this study, PTSD (Hayes & Gifford, 1997; Hayes, Wilson, Gifford, Follette, & Strosahl, 1996).

Mindfulness is a way of engaging one's experience that is antithetical to experiential avoidance. Rooted in Buddhist meditation practices, mindfulness refers to a way of orienting one's self to the present moment (Bishop et al., 2004; Kabat-Zinn, 2003; Martin, 1997). Recent research has broken down mindfulness into five components: the ability to observe one's experience, the ability to describe one's experience, engaging in everyday activities with awareness, nonjudgment or acceptance of one's experiences, and nonreactivity to unpleasant stimuli (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). Definitions of mindfulness differ from experiential avoidance with regard to where the emphasis is placed: experiential avoidance reflects an avoidance of one's present experience or the *absence* of mindfulness, whereas the

various facets of mindfulness explicate *how* to engage one's experience effectively. From this perspective, mindfulness can be seen as method for neutralizing experiential avoidance.

The last ten years has seen an increase in the use of mindfulness-based treatments and techniques, in part to counter experiential avoidance and help people engage their experiences more mindfully. Although researchers have begun to explore the use of mindfulness in the treatment of trauma survivors (Batten, Orsillo, & Walser, 2006; Follette, Palm, & Hall, 2004), there has been little research exploring the relationship between mindfulness and PTSD; thus, the relationship between mindfulness and PTSD symptoms remains unclear.

The purpose of this study is to examine whether mindfulness is a predictor of the severity of posttraumatic stress disorder (PTSD) symptoms distinct from other forms of experiential avoidance. The author proposes that mindfulness offers a unique and informative way of understanding PTSD in a manner that fits conceptually with the experiential avoidance literature. The researchers administered measures of mindfulness, experiential avoidance, and PTSD to a sample of participants. Analyses were conducted to determine whether mindfulness is a predictor of PTSD avoidance symptoms, over and above the contribution of experiential avoidance.  The study will also examine the relationship between mindfulness and measures of experiential avoidance.

*Mindfulness*

The concept of mindfulness was originally derived from research on Buddhist meditation. As has been noted elsewhere, Buddhist philosophy offers a number of behavioral methods for dealing with psychological distress that are as strikingly modern as any cognitive behavioral techniques (de Silva, 1984, 1985, 1993; Mikulas, 1981). Early Buddhist practices that resemble modern behavioral modification techniques include reduction of fear through graded exposure,

social skills training, and prolonged exposure, among others (de Silva, 1993). Because Buddhist

meditation involves sitting with, but not reacting to experience, meditation can be seen as an

extinction technique for taking thought or self-talk as a literal reality (Hayes, 1984). Buddhism

also shares with behaviorism an ahistorical approach to dealing with problems in the here-and-

now (Mikulas, 1981). As Hayes (2002) has noted, behaviorist researchers have "ended up

dealing with themes that have dominated Buddhist thought for thousands of years" (p. 58).

(However, Hayes further asserts that it is up to science to validate Buddhist approaches

empirically.) Much of the recent interest in mindfulness and mindfulness-based treatments can

be traced to Kabat-Zinn's (1990) Mindfulness-Based Stress Reduction program and Linehan's

(1993) Dialectical Behavior Therapy. Mindfulness-based approaches have since been adapted for

a variety of populations and have been associated with improved outcomes (e.g., Grossman,

Niemann, Schmidt, & Walach, 2004; Kenny & Williams, 2007; Melbourne Academic

Mindfulness Interest Group, 2006).

In addition, as mindfulness-based treatments have proliferated, researchers have attempted to

operationally define the construct of *mindfulness*. Definitions of mindfulness emphasize the

maintenance of awareness on one's immediate experience--as opposed to being distracted by

past or future oriented thoughts, or actively blocking out one's experience--with an attitude of

nonjudgment (Bishop et al., 2004; Kabat-Zinn, 2003; Martin, 1997).  Fletcher and Hayes (2005)

have offered a more behavioral definition of mindfulness, as the "defused, accepting, open

contact with the present moment and the private events it contains as a conscious human being

experientially distinct from the content being noticed" (p. 322).

In addition, researchers are still attempting to define the mechanisms of mindfulness that

may promote improved outcomes. Shapiro, Carlson, Astin, and Freedman (2006) recently

proposed a model exploring the possible mechanisms of mindfulness-based treatments. Within their model, the three main axioms, or essential components, of mindfulness are intention, attention, and attitude. Intention refers to the reasons why one is practicing mindfulness. Reasons may change as one deepens one's experience and commitment to mindfulness. Attention refers to the focus on the unfolding of one's experience, moment-by-moment. The authors, finally, stress the importance of the attitude that one brings to mindfulness practice. For example, an attitude of curiosity or openness is more in line with Buddhist thought and recent operational definitions of mindfulness (e.g., Bishop et al., 2004) than a harsh and critical attitude. Interestingly, Baer, Smith, and Allen (2004) found that in samples largely naïve to formal meditation practice, the tendency to be aware of one's experience was associated with greater judgment of that experience, which is quite contrary to the attitude encouraged by mindfulness-based treatments.

Within Shapiro, Carlson, Astin, and Freedman's (2006) model, the proper balance of these three axioms of mindfulness helps to foster a shift in one's overall perspective, what the authors call *reperceiving*. This shift in perspective leads to changes in four additional mechanisms: self-regulation, values clarification, cognitive, emotional, and behavioral flexibility, and exposure. What this means is that as individuals become more mindful they become more adept at maintaining their own internal balance and sense of health, learn to recognize what is genuinely important to them independent of conditioned expectation, respond to situations more flexibly, and experience their own internal states with less reactivity and greater clarity. Although mindful individuals experience negative thoughts, they appear to exhibit a greater ability to "let go" of negative thoughts and focus their attention on healthier ways of relating to their experiences (Frewen et al., in press). Greater mindfulness may enhance

the ability of individuals to label negative affective stimuli, which may, in turn, allow individuals some degree of distance or detachment from these experiences (Creswell, May, Eisenberger, & Lieberman, 2007). Consequently, cultivation of mindfulness can create a sea change in the way one approaches one's experiences. Studies have found that even brief periods of mindful breathing are associated with greater willingness and tolerance to maintaining contact with negative experience (Arch & Craske, 2006).

*Posttraumatic Stress Disorder*

Posttraumatic stress disorder (PTSD) refers to symptoms that develop following exposure to a traumatic experience. Initially called "shell shock," it became more widely studied following the first two World Wars. Lifetime prevalence rates for the development of PTSD are approximately 8% in the United States (American Psychological Association, 2000). Women are twice as likely as men to develop PTSD, which may reflect socio-cultural factors (Gavranidou & Rosner, 2003). According to the current *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV-TR) an individual must meet five criteria in order to qualify for a clinical diagnosis of PTSD (American Psychological Association, 2000). The five criteria include three symptom clusters: re-experiencing, avoidance, and arousal. Foa, Zinbarg, and Rothbaum (1992) hypothesize that these difference clusters of symptoms may reflect different etiological factors related to the traumatic event.

Criterion A stipulates that the individual be exposed to a traumatic event in which the individual felt threatened and experienced intense fear, helpless, or horror. Animal behavior studies suggest that the event must be perceived not only as life threatening, but as uncontrollable and unpredictable, and that the degree of uncontrollability and unpredictability may be related to severity of PTSD symptoms (Foa, Zinbarg, & Rothbaum, 1992). This is

supported in a study of human participants, which found that greater levels of fear of death and losing control during the traumatic event were associated with greater PTSD severity (Gershuny, Cloitre, & Otto, 2003). This criterion is not without controversy, however. Bodkin, Pope, Detke, and Hudson (2007) recently found equivalent rates of PTSD symptoms in a sample of participants with major depression between individuals who did (78%) and did not (78%) report a history of trauma. There is some evidence, then, the criterion A is neither "necessary nor sufficient to produce PTSD" (Rosen, Spitzer, & McHugh, 2008, p. 3).

Criterion B stipulates that the traumatic event be re-experienced in at least one of five ways (e.g., distressing thoughts, dreams, recurrent experience, intense psychological distress when exposed to cues related to the event, or physiological reactivity to internal or external cues). These re-experiencing symptoms may be related to changes in emotional processing in the stressful stimuli in limbic and cortical regions of the brain (Liberzon, Britton, & Phan, 2003).

Most importantly for our purposes, criterion C describes persistent avoidance of stimuli associated with the traumatic event, and a general experience of numbing. Symptoms of criterion C include efforts to avoid experiences related to the trauma, difficulty recalling the trauma, diminished interest in activity, feelings or detachment, restricted affect, and a feeling that one's future has been foreshortened. Individuals feeling a loss of control during the traumatic event may be more likely to engage in avoidant strategies (Foa, Zinbarg, & Rothbaum, 1992).

Criterion D includes persistent symptoms of increased arousal (e.g., insomnia, anger and irritability, poor concentration, hypervigilance, and an exaggerated startle response). Increased cerebral blood flow in the projection area of the nucleus accumbens may be related to hyperarousal symptoms, especially impulsive acts of aggression (Pavic, 2003). In order to meet

criteria for PTSD, the disturbance must last more than one month (Criterion E) and cause clinically significant distress in important areas of functioning.

Of the three symptom clusters (re-experiencing, avoidance, and hyperarousal), research suggests that avoidance is the most characteristic of PTSD, to the extent that screening for avoidance symptoms may be the most efficient way of screening for PTSD (Nemeroff et al., 2006). As already noted, there is a great deal of recent research which suggests that avoidance is predictive of PTSD symptom severity (Boeschen, Koss, Figuerdo, & Coan, 2001; Marshall et al., 2006; Marx & Sloan, 2005; Orcutt, Pickett, & Pope, 2005). Plumb, Orsillo, and Luterek (2004) found that avoidance was a better predictor of PTSD symptoms than trauma severity, although Tull, Gratz, Salters, and Roemer (2004) found that avoidance did not predict PTSD symptoms when controlling for depression, anxiety, and somatization.

*Experiential Avoidance & PTSD*

Hayes, Wilson, Gifford, Follette, and Strosahl (1996) use the term *experiential avoidance* as an umbrella term that includes various types of avoidance. Experiential avoidance is "the phenomenon that occurs when a person is unwilling to remain in contact with private experiences (e.g., bodily sensations, emotions, thoughts, memories, behavioral predispositions) and takes steps to alter the form or frequency of these events and the contexts that occasion them" (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996, p. 1154). It includes thought suppression, avoidant coping, low emotional intelligence, and alexithymia (Hayes et al., 2004; Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). Thus PTSD avoidance symptoms are subsumed under the broader notion of experiential avoidance.

Research suggests that engagement in activities reflective of experiential avoidance underlie several psychopathologies. (Hayes & Gifford, 1997; Hayes, Wilson, Gifford, Follette, &

Strosahl, 1996). Clinical examples of experiential avoidance include use of substances to suppress anxiety, engagement in obsessive-compulsive behaviors in order to avoid aversive thoughts, panic attacks as a reaction against physiological arousal, and the use of suicidal and para-suicidal behaviors among individuals with borderline personality disorder in order to escape aversive states of arousal or distressing experiences (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). There are four reasons experiential avoidance may be harmful: 1) it may actually increase the frequency of the experience that one wants to avoid; 2) methods of experiential avoidance such as substance abuse, dissociation, and social withdrawal may promote long-term harm; 3) these forms of avoidance become behaviorally linked to private experience, such that one may respond with avoidance even if there is no current threat; and 4) by blocking out a portion of one's experience, the individual may not have access to personal information that may be useful or necessary in making informed decisions (Hayes & Gifford, 1997). Over time, experiential avoidance appears to negatively impact overall quality of life and interferes with the ability to deal with situations flexibly (Kashdan, Barrios, Forsyth, & Steger, 2006). It may also impair recall of specific details in autobiographical memory (Hauer, Wessel, & Merckelbach, 2006).

Lately, researchers have increasingly begun to examine the relationship between experiential avoidance and PTSD. Specifically, use of avoidance strategies appears to be predictive of PTSD symptomatology (Gershuny, Cloitre, & Otto, 2003; Marshall et al., 2006; Marx & Sloan, 2005), as noted. Avoidant strategies may temporarily relieve trauma-related distress in the short-term but appear to maintain trauma-related symptoms in the long-term (Polusny & Follette, 1995; Rosenthal, Hall, Palm, Batten, & Follette, 2005). Following exposure to a traumatic event, avoidance strategies may initially be focused on activities and stimuli that

remind the individual of or are connected to the individual's experience of the event; however,

these strategies may be applied more generally to additional experiences over time to non-trauma

related events (Varra & Follette, 2005; Weiss & Ozer, 2006). The use of experiential avoidance

as a way to cope with emotional distress in men with PTSD may actually increase emotional

dysregulation, increasing the incidence of aggressive behavior (Tull, Jakupcak, Paulson, &

Gratz, 2007). The continued use of avoidance maintains the association of the trauma with

conditioned cues because it prevents any new learning or habituation (Falsetti, Monnier, &

Resnick, 2005).

Polusny and Follette (1995) explore a model of experiential avoidance in understanding

the maintenance of psychopathology in survivors of childhood sexual abuse (CSA). By engaging

in avoidant coping strategies and avoiding internal experiences (e.g., thoughts, emotions, and

memories) related to the abuse, CSA survivors may actually increase psychological distress and

rates of dysfunctional behavior such as substance use and high-risk sexual behavior (Polusny &

Follette, 1995). Avoidance behaviors commonly used by survivors of CSA include substance

abuse, dissociation, and self-harm, as these behaviors result in disengagement or distraction from

present experience (Chapman, Gratz, & Brown, 2006; Leonard & Follette, 2002). This model has

been supported by subsequent studies of survivors of CSA. One study found that, although

severity of CSA predicted psychological distress, CSA severity predicted significantly less of the

variance than avoidance (Batten, Follette, & Aban, 2001). Individuals with a history of CSA

before 14 years of age who utilize avoidance strategies report greater levels of trauma related

distress (Rosenthal, Hall, Palm, Batten, & Follette, 2005).

*Thought suppression*. Thought suppression is one of the most widely studied forms of

experiential avoidance. Psychoanalysis has always remained strongly connected to Freud's

(1966) original emphasis on the notion that repressed impulses create problems. However, it was not until the last few decades that researchers, inspired by a Dostoyevsky quotation about how difficult it is to not think about a white bear when instructed to do so (Wegner & Schneider, 2003), attempted to study the effects of thought suppression under experimental conditions (Wegner, Schneider, Carter, & White, 1987). There are three basic classifications of thought suppression effects: 1) an increased likelihood of target thoughts following suppression; 2) a sudden increase in target thoughts following suppression; 3) an increase in intrusive target thoughts during suppression when cognitive demands begin to interfere with attempts at suppression (Wenzlaff & Wegner, 2000).

Of the various postulated models of the mechanisms behind thought suppression, Wenzlaff and Wegner (2000) argue that the *theory of ironic processes* offers the best explanatory power as to why attempts at thought suppression result in an increase in unwanted thoughts. According to the theory of ironic processes, thought suppression is maintained by two processes. One process involves a conscious attempt to think about thoughts other than the unwanted thought, and the other process operates just on the edge of consciousness in order to monitor the success of the suppression efforts. This process is "ironic" because the continued monitoring for the unwanted thought contradicts the overarching goal of thought suppression, making the unwanted thought more salient and thus priming one's mind for a rebound effect.

Under experimental conditions, non-clinical samples have exhibited a rebound effect when asked to suppress a thought (Davies & Clark, 1998b; Wegner, Schneider, Carter, & White, 1987). There also appears to be a relationship between mood and thought suppression. Negative mood has been found to be the strongest predictor of intrusive thoughts (Davies & Clark, 1998a). Aversion towards negative thoughts and the tendency to attempt to suppress the unwanted

thoughts may be related to depression severity (Wegner & Zanakos, 1994), although Starr and Moulds (2006) found no relationship between thought suppression and depression in a non-clinical sample.

Within the PTSD literature, it should also be noted that the term "intrusive thoughts" may be something of a misnomer, as the term encompasses not only thoughts or lexical cognitions, but images, memories, and impulses as well (Falsetti, Monnier, Davis, & Resnick, 2002). The intrusions are not necessarily memories of specific events and may be more related to a worst-case scenario (Falsetti, Monnier, & Resnick, 2005). The use of thought suppression appears to be a predictor of the severity of PTSD symptoms (Mayou, Ehlers, & Bryant, 2002; Steil & Ehler, 2000), and there also appears to a relationship between thought suppression and the rebound effect in individuals who meet criteria for PTSD. Shipherd & Beck (1999) found that women with PTSD following a sexual assault exhibited a rebound effect in rape-related thoughts following a deliberate suppression, but survivors without PTSD did not exhibit a rebound effect. A similar pattern was found in survivors of motor vehicle accidents, where individuals with PTSD exhibited a rebound effect, but those without PTSD did not (Shipherd & Beck, 2005). Shipherd and Beck (2005) suggest that the rebound effect may play a role in maintaining the re-experiencing symptoms associated with PTSD.

However, other researchers have not always found that an increase in intrusive thoughts follows thought suppression. In a sample of anxious undergraduate students, Cougle, Smits, Lee, Powers, and Telch (2005) found that participants in a suppression group exhibited *fewer* anxious thoughts following a period of thought suppression than a non-suppression group. They suggest that in conditions such as PTSD, where intrusive thoughts are a symptom of the disorder, the frequency and severity of the intrusive thoughts are influenced more by anticipation of the

thought than by the act of suppression. Roemer and Salters (2004) found no effect for

suppression in a sample of sexual assault survivors but suggest that this may be due to a problem

with the experimental manipulation.

*Avoidant coping.* Avoidant coping refers to the tendency to respond to distressing stimuli

through distraction, such as through socializing or watching television (Endler & Parker, 1990,

1994). Following trauma, individuals may engage in strategies to avoid stimuli that remind them

of the traumatic event (Steil & Ehlers, 2000). Although avoidant coping may be adaptive in the

short term in some situations (Chaffin, Wherry, & Dykman, 1997), a number of studies exploring

the relationship between coping style and trauma have found that an avoidant coping style is

predictive of PTSD symptomatology.

Amir et al. (1997) found a positive relationship between the use of a suppressive coping

style and greater symptoms of intrusive traumatic thoughts and experiential avoidance in a

clinical sample. Dempsey, Overstreet, and Moely (2000) found a positive relationship between

avoidant coping strategies and levels of PTSD re-experiencing symptoms in a sample of African

American inner-city youth (ages 11-14). In college-age samples avoidant coping style predicted

higher PTSD severity in a sample of students exposed to community violence (Scarpa, Haden, &

Hurley, 2006), and the development of PTSD in a group of undergraduates exposed to a terrorist

explosion on a bus (Gil, 2005). In the Gil study, the researcher had collected his sample of

coping styles for another study two weeks before the terrorist attack and was able to collect a

post-trauma measure of coping one month after the attack. He assessed for PTSD five months

later.

In a sample of motor vehicle accident survivors, Steil and Ehlers (2000) found that both

individuals with and without PTSD reported trauma-related intrusions. The authors found that

frequency of the intrusions showed only a weak relationship with PTSD symptom severity, but that intrusions reported as distressing appeared to be more predictive of PTSD symptoms. The experience of intrusive thoughts as distressing has been found to predict the use of avoidant coping strategies which may only serve to maintain the PTSD symptoms (Steil & Ehlers, 2000). War veterans with PTSD have been shown to be more likely to use maladaptive coping styles such as avoidance than war veterans without PTSD (Biro, Novović, & Gavrilov, 1997), and avoidant coping predicted greater PTSD symptoms (Stein et al., 2005) in a sample of Gulf War veterans. In addition, across two studies, Johnsen, Eid, Laberg, and Thayer (2002) found that all coping styles except for avoidant ones led to a reduction in PTSD symptoms in a military sample.

*Emotional intelligence and alexithymia.* Although low emotional intelligence is not the same as an active form of experiential avoidance, research on the relationship between PTSD and alexithymia suggests that lack of emotional awareness may play a strong role in the maintenance of PTSD symptoms. Introduced by Salovey and Mayer (1990), emotional intelligence is a broad construct that describes emotional abilities. Mayer and Salovey's (1997) definition of emotional intelligence encompasses four main parts or branches involving 1) the ability to be aware of and express emotions, 2) the ability to notice how feelings influence thoughts, 3) the ability to understand emotions, and 4) the ability to regulate mood in a way that influences growth. Although a study of individuals with prior trauma found that individuals higher in emotional intelligence exhibited fewer trauma related symptoms (Hunt & Evans, 2004), the direction of the relationship between trauma and emotional intelligence remains unclear. In some cases, trauma survivors may block out emotionally-laden stimuli related to the trauma, appearing lower in emotional intelligence post-trauma. For others, higher pre-morbid emotional

intelligence may help trauma survivors process the traumatic experience, serving as a protective function against the development of PTSD.

More recently, Ciarrochi and Godsell (2005) have recast emotional intelligence in the language of the Acceptance and Commitment (ACT) literature. The four dimensions of their model of emotional intelligence include: *defusing unhelpful self-concepts*, a willingness to examine and accept negative self-evaluations without needing to defend against them; *defusing unhelpful thoughts and emotions*, the ability to examine emotionally unpleasant verbal content without getting caught up in it while remaining mindful of one's present experience; *using emotional information*, the ability to identify and understand emotions; and *effective emotional orientation*, a willingness to engage in and accept emotionally charged or aversive experiences. According to the authors emotional intelligence involves the ability to accept one's emotions without trying to manipulate one's experience. From this perspective, mindfulness promotes emotional intelligence and helps individuals free themselves from cognitive fusion, the tendency for verbal and cognitive stimuli to regulate behavior to the extent that one believes that one's thoughts accurately reflect the truth of one's experience. They argue that therapies such as ACT promote emotional intelligence.

Although the introduction of the term alexithymia preceded that of emotional intelligence, alexithymia is arguably related to a subset of emotional intelligence and is representative of a condition characterized by low emotional intelligence. The term alexithymia was first introduced by Sifneos (1973) to describe patients exhibiting psychosomatic symptoms who had difficulty identifying and describing emotions. The vast majority of the research examining the relationship between emotional intelligence and PTSD has been conducted using measures of alexithymia. Among military personnel with combat-related trauma, the alexithymic

factor of "externally oriented thinking" predicted greater severity of PTSD symptoms (Monson,

Price, Rodriguez, Ripley, & Warner, 2004), and the "inability to identify affects" and

"difficulties naming affects" factors were found to be higher in individuals with PTSD in a

sample of Iraqi war refugees (Söndergaard & Theorell, 2004). War veterans with alexithymia

may also develop PTSD following a traumatic event earlier than non-alexithymic veterans

(Kosten, Krystal, Giller, Frank, & Dan, 1992).

Higher levels of alexithymia may also be a consequence of PTSD symptoms. Badura

(2003) suggests that alexithymia in individuals with PTSD may be better understood as

representative of the emotional numbing component of PTSD than as a distinct construct, that

individuals with PTSD begin to employ an avoidance-based coping style employed to deal with

re-experiencing and hyperarousal symptoms. In a group of combat veterans, Badura found that

the severity of combat exposure was correlated with the severity of alexithymia; moreover,

among men, 87.9% of veterans who scored above the cut-off score for PTSD also scored above

the normative sample mean for alexithymia. Fukunishi, Sasaki, Chishima, Anze, and Saijo

(1996) found that alexithymia and PTSD symptoms of emotional numbing and avoidance

appeared to be strongly related constructs. However, although Frewen et al. (2008) found a

strong relationship between alexithymia and emotional numbing, they found no relationship

between alexithymia and avoidance.  Qualitative data collected during the study suggested that

trauma disrupts the individual's ability to interpret the relationship between mind-body

experiences.

Consequently, it seems likely that the relationship between alexithymia and PTSD is

bidirectional. On one hand, individuals with alexithymia may be more vulnerable to developing

PTSD given the same levels of trauma exposure. For example, Hunt and Evans (2004) found

among a community sample of individuals with past trauma that individuals with lower emotional intelligence were more likely to use an avoidance strategy, which, in turn, is related to greater likelihood of PTSD symptoms. In addition, there appears to be a relationship between use of avoidant coping strategies and PTSD symptoms (Amir et al., 1997; Biro, Novović, & Gavrilov, 1997; Dempsey, Overstreet, & Moely, 2000; Gil, 2005; Johnsen, Eid, Laberg, & Thayer, 2002; Scarpa, Haden, & Hurley, 2006). If individuals with lower emotional intelligence are more likely to use avoidant coping strategies, and as avoidant coping strategies are associated with higher levels of PTSD symptoms, then individuals with lower emotional intelligence may be more likely to develop PTSD symptoms, although there may be additional pathways other than via coping style.

However, research also suggests that exposure to traumatic events may lower emotional intelligence, possibly in response to PTSD symptoms. Söndergaard and Theorell (2004) found that alexithymia increased following exposure to trauma. In a sample of war refugees assessed at three-month intervals, although the presence of alexithymia increased following exposure to severe trauma independent of PTSD, specific alexithymia facets "inability to identify affects" and, to a lesser degree, "difficulties naming affects" were higher in participants with PTSD. Badura (2003) noted that severity of combat exposure was correlated with severity of alexithymia in combat veterans, although the relationship is less clear in this study because assessments were only made following exposure to trauma.

*Mindfulness-Based Treatments*

*Mindfulness-Based Stress Reduction*. Although mindfulness and meditation had been studied by psychology for decades (see Rao, 1989, for a review of the early literature), it was Kabat-Zinn's pioneering work with his Mindfulness-Based Stress Reduction program (MBSR) in

the early 1980's that helped lay the groundwork for the recent explosion of mindfulness-based treatments. MBSR is a stress reduction program based on the Buddhist notion that suffering is caused when individuals struggle against their pain. It emphasizes remaining in the present moment and adopting an attitude of non-judgment towards one's experience (Kabat-Zinn, 1990). It is usually presented in 8-10 weekly group sessions with daily homework assignments between meetings. Participants are taught a technique called the body-scan, as well as basic yoga and formal sitting meditation. They are encouraged to integrate these practices in some form in their everyday lives. With the body-scan, participants lie on their backs and, beginning with their toes, gradually shift their attention through different parts of the bodies. Hatha yoga is taught to encourage participants to become more in touch with their body through slow, deliberate stretching exercises. The practice of formal sitting meditation allows participants to create greater awareness around their thoughts and emotions. Through use of these techniques, which help to cultivate varying degrees of mindfulness, participants are taught to observe thoughts, feelings, and bodily sensations objectively without trying to cling to or push away from their experience.

Early studies found that reduction in distress among chronic pain participants (Kabat-Zinn, Lipworth, & Burney, 1985) were maintained at a four-year follow-up (Kabat-Zinn, Lipworth, Burney, & Sellers, 1986). MBSR also demonstrated success in treating anxiety disorders (Kabat-Zinn et al., 1992), maintained after a three-year follow-up (Miller, Fletcher, & Kabat-Zinn, 1995). It  has since been adapted for and shown success in reduction of binge-eating (Kristeller & Hallett, 1999), reduction of stress among cancer patients (Carlson, Speca, Patel, & Goodey, 2003; Speca, Carlson, Goodey, & Angen, 2000; Tacón, Caldera, & Ronaghan, 2004), and increasing quality of life among those with traumatic brain injuries (Bédard et al., 2005). It

has also been shown to increase gains among individuals concomitantly involved in individual outpatient psychotherapy (Kutz et al., 1985; Weiss, Nordlie, & Siegel, 2005). Overall, empirical evidence suggests that MBSR may be adapted to benefit a wide variety of people (Baer, 2003; Grossman, Niemann, Schmidt, & Walach, 2004). In reference to Hayes' (2002) comment that only science can evaluate the effectiveness of Buddhist principles, MBSR remains a high-profile example of science validating Buddhist principles. De Silva (1993) draws attention to the parallels between the emphasis in MBSR on teaching meditation to chronic pains patients to help manage their pain and passages in early Buddhist texts such as the *Samyutta Nikaya*, which describes how individuals may train themselves to separate mental experiences of pain from purely physical experiences of pain.

*Mindfulness-Based Cognitive Therapy for Depression.* Encouraged by Kabat-Zinn's work, Segal, Williams, and Teasdale (2002) combined MBSR with cognitive therapy, creating a mindfulness-based cognitive therapy (MBCT) program for the prevention of relapse in previously depressed people who were not currently in a depressive episode when they entered the program. MBCT consists of 8 weekly group sessions that, like MBSR, teach body-scan, yoga, and formal meditation to participants who are required to complete daily homework assignments between sessions. Initial studies have suggested that MBCT is an effective prophylactic against depressive relapse for individuals with three or more previous episodes of depression; for these individuals, relapse rates were reduced at a one-year follow-up (Teasdale et al., 2000; Ma & Teasdale, 2004).

*Dialectical Behavioral Therapy.* Along with Kabat-Zinn's work, Linehan's (1993) Dialectical Behavior Therapy (DBT) has also been enormously influential in creating interest in mindfulness-based techniques. Like MBSR, DBT is rooted in Buddhist thought. DBT employs

mindfulness practice without traditional sitting meditation, although DBT providers are encouraged to practice meditation. It was developed for individuals who may be too emotionally dysregulated and chaotic to maintain formal practice, which they may find too intense. Having taken a year's sabbatical to train in Zen monasteries in California and Germany (Butler, 2001), Linehan incorporated skills in DBT that emphasize remaining attentive to the present moment but which do not necessarily involve formal meditation. For example, DBT participants practice observing their thoughts and emotions, observing a specific aspect of their external world, and other related skills. DBT has been demonstrated to be effective in clients with borderline personality disorder, particularly in reducing parasuicidal behaviors and keeping clients in treatment (Linehan, Cochran, & Kehrer, 2001).

*Mindfulness-Based Treatment for Trauma Survivors.*

Of the various treatments available for PTSD, prolonged exposure may be the most effective (see Nemeroff, 2006, for a review). Prolonged exposure involves systematically and frequently experiencing—and thus counteracting the tendency to avoid--traumatic recollections until they no longer trigger significant distress and anxiety. Some researchers have argued that mindfulness is a form of exposure therapy (Baer, 2003; Linehan, 1993; Shapiro, Carlson, Astin, & Freedman, 2006). From this perspective, mindfulness is exposure to one's experience and serves a function similar to that of exposure therapy, that of reducing distress and avoidant behaviors.

Although researchers are now beginning to employ mindfulness techniques in their work with trauma survivors (Follette, Palm, & Hall, 2004), research on the use of mindfulness with PTSD remains rather sparse, and what has been published is fairly speculative. Mindfulness may help prepare trauma survivors for exposure-based interventions as they learn to more effectively

regulate their emotions and accept themselves and their experience (Follette, Palm, & Pearson, 2006). Encouraging trauma survivors to engage in mindfulness practices may also increase psychological flexibility and help to extinguish avoidant behaviors that maintain trauma-related symptoms (Follette, Palm, & Pearson, 2006).

Formal sitting meditation may not be appropriate for individuals with active PTSD symptoms, as they may feel overwhelmed if introduced to meditation too quickly. Batten, Orsillo, and Walser (2006) recommend a more graduated approach of teaching individuals with PTSD to become more mindful before introducing sitting meditation. Follette, Palm, and Hall (2004) offer an integrated behavioral approach to treating trauma that draws from various behavioral and mindfulness-based treatments; however, there are not any published outcome data on the application of this approach.

Although there appears to be a correlation between measures of mindfulness and avoidance (see Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006), and between experiential avoidance and PTSD (already discussed), no one has studied the relationship between mindfulness and PTSD. As mindfulness may be helpful in reducing avoidance behaviors that maintain PTSD symptoms, and given the initial experimentation with incorporating mindfulness into the treatment of PTSD, it is important to understand the relationship between the two constructs. As experiential avoidance reflects a lack of mindfulness, it provides the best conceptual fit to bridge the mindfulness literature with that of trauma and PTSD. By understanding the relationship between mindfulness and PTSD, researchers may develop a more precise understanding of what aspects of mindfulness may be helpful in the treatment of PTSD.

Consistent with the DBT model (Linehan, 1993), recent research suggests that mindfulness is not a unidimensional construct (Baer, Smith, & Allen, 2004; Baer, Smith,

Hopkins, Krietemeyer, & Toney, 2006). As noted, there appear to be at least five facets of mindfulness: the ability to observe one's experience, the ability to describe one's experience, a tendency to engage everyday activities with awareness, an absence of self-judgment, and lower reactivity to aversive stimuli (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). It may prove useful to delineate specific components of mindfulness that relate to PTSD symptoms in order to develop more precisely mindfulness-based treatments that target these specific forms of avoidance. Perhaps one component of mindfulness (e.g, nonreactivity) may be more efficacious in reducing PTSD symptoms than another (e.g., the tendency to act with awareness). Certain mindfulness skills may even exhibit a prophylactic effect, inoculating recent trauma survivors from developing PTSD. For these reasons, understanding the relationship between mindfulness and PTSD could inform the development of mindfulness-based treatments for PTSD, and mindfulness may help to flesh out our understanding of the role of experiential avoidance in maintaining PTSD symptoms.

*Mindfulness as a Predictor of Avoidance Symptoms*

The main purpose of this study was to incorporate mindfulness into an experiential avoidance understanding of PTSD to determine whether mindfulness is a predictor of lower PTSD avoidance symptom severity. As experiential avoidance is something of an umbrella term, the study examined specific aspects of experiential avoidance related to PTSD whose relationship with PTSD has already been established empirically, such as thought suppression, avoidant coping, emotional intelligence, and alexithymia. Relationships between measures of mindfulness and experiential avoidance, thought suppression, emotional intelligence, and alexithymia have been explored in previous research (Baer, Smith, & Allen, 2004; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006; Hayes et al., 2004), but this study will examine what

each uniquely contributes to understanding PTSD. Although there have been some attempts to incorporate mindfulness into the treatment of PTSD (Follette, Palm, & Pearson, 2006; Follette, Palm, & Hall, 2004), a literature search revealed no previous research that has empirically explored the relationship between mindfulness and avoidance symptoms. Understanding the relationship between mindfulness and PTSD could help researchers to tailor mindfulness-based treatments for the treatment of trauma-survivors.

*Hypotheses*

*Mindfulness, experiential avoidance, and PTSD.* To address the question of whether mindfulness is related to PTSD avoidance symptom severity, PTSD avoidance symptom severity was regressed on measures of experiential avoidance and mindfulness in order to examine the contribution of mindfulness to the prediction of PTSD avoidance symptom severity, above and beyond the contribution of experiential avoidance. Unpublished data collected by this author from a previous study showed only one significant correlation between PTSD avoidance symptom severity and factors of mindfulness: the ability to observe one's experience was negatively related to PTSD avoidance symptoms severity ($r = -.55$, $p = .008$; Waltz & Thompson, 2007). Based on this previous finding, it was hypothesized that mindfulness— particularly the ability to observe one's experience—is related to lower PTSD avoidance symptom severity independent of experiential avoidance. We also predicted that individuals with PTSD would exhibit higher experiential avoidance and lower than individuals with no reported trauma history.

Method

*Participants*

Participants consisted of Introductory Psychology students ($N = 378$; 267 females), 18 years or older. (One demographics form was left incomplete.) Ages ranged from 18 – 51, with 18 being the modal age (45.2 %) and 19 being the median age. (See Table 1 for more detailed demographic information.)

Table 1

*Demographics of Total and PTSD Samples*

| | Total Sample (*N* = 378) | PTSD Sample (*n* = 44) |
|---|---|---|
| Age in years | | |
| mean | 19.56 (3.44) | 20.34 (5.46) |
| range | 18-51 | 18-51 |
| #female (%) | 267 (70.6%) | 33 (75.0%) |
| relationship status (%) | | |
| single | 255 (67.5%) | 30 (68.2%) |
| relationship | 114 (30.2%) | 14 (31.8%) |
| married | 8 (2.1%) | 0 (0%) |
| military experience (active duty) | | |
| | 8 (5) | 2 (1) |
| past counseling (%) | 140 (37.0%) | 31 (70.5%) |
| Mindfulness experience | | |
| meditation | 36 (9.5%) | 5 (11.4%) |
| yoga | 60 (15.9%) | 9 (20.5%) |

*Measures*

*Five Facet Mindfulness Questionnaire (FFMQ; Baer, Smith, Hopkins, Krietemeyer, &*

*Toney, 2006*). The FFMQ is a 39-item self-report measure of five facets of mindfulness derived

from a factor analysis of five existing mindfulness measures. Items are rated on a Likert scale of

1 (never or very rarely true) to 5 (very often or always true). The five facets are: nonreactivity to

inner experience; observing/noticing/attending to sensations/perceptions/thoughts/feelings;

acting with awareness/automatic pilot/concentration/nondistraction; describing/labeling with

words; and nonjudging of experience. The observe subscale does not appear to load significantly

on an overall mindfulness factor, and it has been found to correlate to maladaptive constructs in

non-meditating samples but not in samples with meditation experience (Baer et al., 2006; Baer,

Smith, Lykins et al., in press). Internal consistency was acceptable (*alphas* were .75 and above),

and the FFMQ has also exhibited acceptable convergent and discriminatory validity with

measures of thought suppression, emotional intelligence, and experiential avoidance. (See

Appendix A.)

   *Acceptance and Action Questionnaire (AAQ; Hayes at al., 2004).* The AAQ is 9-item

self-report measure of experiential avoidance rated on 7-point Likert scale from 1 (never true) to

7 (always true). Higher scores are related to greater experiential avoidance. Test-retest reliability

was .64 over a four-month period. Internal consistency was acceptable ($\alpha = .70$). It exhibited

expected convergent and discriminatory validity with measures of thought suppression,

dissociation, coping, and PTSD. (See Appendix B.)

   *White Bear Suppression Inventory (WBSI; Wegner & Zanakos, 1994).* The WBSI is a 15-

item self-report measure of thought suppression. Items are rated on a 5-point scale from 1

(strongly disagree) to 5 (strongly agree). Items include "There are things I prefer not to think

about" and "I have thoughts I cannot stop." Items are totaled for a unidimensional score. The

WBSI is a widely used measure of thought suppression and has exhibited good internal

consistency (above .70) and appropriate convergent and discriminant validity. (See Appendix C.)

   *Coping in Stressful Situations (CISS; Endler & Parker, 1994).* The CISS is a 48-item

self-report measure of coping that categorizes coping strategies according to one of three styles:

task-oriented, emotion-oriented, and avoidance-oriented. Items are rated on a 5-point Likert scale from 1 (not at all) to 5 (very much). It was based on the 70-item Multidimensional Coping Inventory (MCI; Endler & Parker, 1990) and has been used with college, adult, and adolescent samples. Both emotional-oriented and avoidance-oriented coping styles appear to be related to the construct of experiential avoidance (Walser & Hayes, 1998). It appears to have excellent psychometric properties. *Alphas* were all above .75, and it exhibited appropriate convergent and discriminant validity with other measures of coping styles. It appears to have stronger psychometric properties than other coping measures (Endler & Parker, 1990). (See Appendix D.)

*Trait Meta-Mood Scale (TMMS; Salovey, Mayer, Goldman, Turvey, & Palfai, 1995).* This study used a 30-item version of the original 48-item self-report measure of trait meta-mood that contains subscales measuring attention to one's feelings (Attention), the ability to discriminate among feelings (Clarity), and the ability to repair or maintain one's moods (Repair). Items are rated on a Likert scale from 5 (strongly agree) to 1 (strongly disagree). The measure can also be scored to yield one uni-dimensional measurement of emotional intelligence. Internal consistency is good for each of the subscales, as Cronbach's coefficient *alphas* were all above .80 for the shorter version. (Appendix E.)

*Toronto Alexithymia Scale (TAS-20; Bagby, Parker, & Taylor, 1994a, 1994b).* The TAS is a 20-item self-report measure of alexithymia, and is the most widely used measure of alexithymia in empirical research. Each item is rated on a 5-point Likert scale ranging from 1(strongly disagree) to 5 (strongly agree). Factor 1 (identify feelings) assesses the ability to identify feelings and distinguish them from physical sensations that accompany emotional arousal. Factor 2 (describe feelings) assesses the ability to describe feelings to others. Factor 3 (externally oriented) assesses the ability to assess externally oriented thinking. The TAS-20 may

also be scored as one uni-dimensional measure of alexithymia. A recent re-assessment of the

psychometric properties of the TAS-20 found internal consistency *alphas* above .70 for each

factor in a community sample (Parker, Taylor, & Bagby, 2003). (The measure is not in public

domain, so it is included in Appendix.)

*Posttraumatic Stress Diagnostic Scale (PDS; Foa, Cashman, Jaycox, & Perry, 1997).*

The PDS is a self-report measure of PTSD that corresponds to *DSM-IV* criteria. Participants are

offered a checklist of 12 traumatic events that can be chosen (including "other") and are then

asked which disturbed them the most in the past month. They then rate 17 items corresponding to

each of the *DSM-IV* PTSD criteria: reexperiencing (5), avoidance (7), and hyperarousal (5).

Summing the 17 symptom items provides a symptom severity score. Coefficient *alphas* were .92

for Total Symptom Severity, .78 for Reexperiencing, .84 for Avoidance, and .84 for Arousal. It

exhibited strong convergent validity with structured clinical interviews for PTSD. (The measure

is not in public domain, so it is not included in the Appendix.)

*Demographics.* A short demographics form was included at the end of the packet asking

about gender, age, marital status, military status, counseling experience, and experience with

various mindfulness practices. There was also a rating scale of distress on a Likert scale from 1

(not distress) to 5 (extremely distressed) in order to assess if the study was an aversive

experience for participants. Participants could indicate if they wanted to discuss any concerns

with the examiner. (Appendix F.)

*Procedure*

Because of the sensitive nature of assessing trauma, participants completed questionnaire

packets in private, individual rooms. There was no prerequisite for participating, and no one was

prescreened for trauma history. They received experimental credit for their participation.

Data from the PDS indicated that 44 participants (11.6 %; 33 females) of the entire

sample ($N = 378$) met criteria for PTSD. Ages ranged from 19 – 51, with 19 being the median

age, but 18 and 19 were evenly split as the modal ages (36.4 % for each). Of the types of traumas

indicated, the most commonly reported were "other" ($n = 19$; 43.2 %), "sexual assault" ($n = 9$;

20.5 %), and "life-threatening illness" ($n = 8$; 18.2 %). "Other" included child abuse ($n = 2$),

witnessing a partner's suicide or attempted suicide ($n = 3$), death in the family ($n = 2$), as well as

items that could probably have been categorized under PDS headings such as accidents and

illness. (Refer to Table 1 for more detailed demographic information.)

Participants who met PDS PTSD criteria were labeled as our *PTSD* group ($n = 44$).

Participants who did not endorse any trauma history, or who endorsed experiences that did not

meet DSM criterion A for a trauma (e.g., watching the World Trade Center towers fall on

television) were classified into our *control* group ($n = 123$). We also created a third group who

experienced a criterion A qualifying trauma, but who did not meet PDS PTSD criteria. Members

of this group met criterion A according to the PDS; that is, they were exposed to a traumatic

event that involved the threat of death or injury, and the individual responded with great distress;

however, they did not meet PTSD criteria. We labeled this third group *trauma-no PTSD* ($n =$

147).

## Results

*Internal Consistency*

Cronbach's coefficient *alphas* were computed for all measures to assess internal

consistency. Most *alphas* were very acceptable; the AAQ and TAS-20 Factor 3 were

questionable. The following *alphas* were computed for the entire sample. FFMQ subscales were:

observe ($\alpha = .77$), describe ($\alpha = .90$), act with awareness ($\alpha = .88$), nonjudgment ($\alpha = .89$), and

nonreactivity ($\alpha$ = 75). Measures of experiential avoidance were: AAQ ($\alpha$ = .67); WBSI ($\alpha$ = .87); CISS emotion-oriented coping ($\alpha$ = .88) and avoidance-oriented coping ($\alpha$ = .80); TAS-20 total ($\alpha$ = .83), TAS-20 subscales Factor 1 (identify feeling; $\alpha$ = .82), Factor 2 (describe feeling; $\alpha$ = .79), and Factor 3 (externally-oriented thinking; $\alpha$ = .63); TMMS total ($\alpha$ = .88), TMMS subscales attention ($\alpha$ = .85), clarity ($\alpha$ = .88), and repair ($\alpha$ = 80).

The following *alphas* were computed separately for the sample that met criteria for PTSD. Subscales of PDS PTSD symptom severity were: total symptom severity ($\alpha$ = .86), reexperiencing ($\alpha$ = .81), avoidance ($\alpha$ = .78), and arousal ($\alpha$ = .65). FFMQ subscales were: observe ($\alpha$ = .66), describe ($\alpha$ = .95), act with awareness ($\alpha$ = .89), nonjudgment ($\alpha$ = .88), and nonreactivity ($\alpha$ = .72). Measures of experiential avoidance were: AAQ ($\alpha$ = .70); WBSI ($\alpha$ = .76); CISS emotion-oriented coping ($\alpha$ = .86) avoidance-oriented coping ($\alpha$ = .61); TAS-20 total ($\alpha$ = .84), TAS-20 subscales Factor 1 (identify feeling; $\alpha$ = .80), Factor 2 (describe feeling; $\alpha$ = .75), and Factor 3 (externally-oriented thinking; $\alpha$ = .66); TMMS total ($\alpha$ = .86),TMMS subscales attention ($\alpha$ = .79), clarity ($\alpha$ = .86), and repair ($\alpha$ = 83).

*Between Group Differences by Trauma History*

We were interested in whether there were significant differences on measures of experiential avoidance and mindfulness between participants with and without PTSD. We hypothesized that individuals with PTSD would score significantly higher on experiential avoidance and lower on mindfulness compared with participants with no prior trauma history, and compared with participants with a trauma history who did not meet PDS PTSD criteria.

One-way ANOVAs were conducted to test for possible differences in scores on the measures (e.g., mindfulness, experiential avoidance) across groups (control, trauma-no PTSD, PTSD). Results are presented in Table 2. Significant differences were found on three FFMQ

subscales: act with awareness [$F(2, 312) = 7.47$, $p < .01$], nonjudgment [$F(2, 311) = 20.69$, $p < .001$], and nonreactivity [$F(2, 309) = 6.18$, $p < .01$]. In addition, differences were found on measures of experiential avoidance: AAQ [$F(2, 311) = 12.00$, $p < .01$], WBSI [$F(2, 307) = 19.50$, $p < .01$], CISS emotion-oriented coping [$F(2, 290) = 14.62$, $p < .01$], TAS-20 Factor 1 (identify feelings) [$F(2, 311) = 18.79$, $p < .01$], TAS-20 Factor 2 (describe feelings) [$F(2, 311) = 6.72$, $p < .01$], TMMS clarity [$F(2, 311) = 9.42$, $p < .01$], and TMMS repair [$F(2, 311) = 13.27$, $p < .01$]. No significant differences were found between groups on FFMQ observe [$F(2, 311) = 2.51$, $p = .08$], FFMQ describe subscales [$F(2, 311) = 2.71$, $p = .07$], CISS avoidance-oriented coping [$F(2, 298) = 1.12$, $p = .33$], TAS-20 Factor 3 (externally oriented thinking) [$F(2, 310) = .70$, $p = .50$], and TMMS attention [$F(2, 311) = .06$, $p = .94$].

In order to determine where group differences lay, Tukey's Honestly Significant Differences post-hoc tests were conducted for measures that exhibited significant $F$-values. Significant differences between the control and PTSD, and between the PTSD and the trauma-no PTSD groups were found for all measures with significant $F$-values. No differences were found between the control and trauma-no PTSD groups. The $p$-values for the post-hoc tests were less than .01. Cohen's $d$'s were calculated to estimate effect sizes of the differences. Effect sizes ranged from medium to large and are presented in Table 3.

Table 2

*Comparison of Measures between Control, Trauma-no PTSD, and PTSD Groups*

| | Control | | Trauma-no PTSD | | PTSD | |
|---|---|---|---|---|---|---|
| | *n* = 123 | | *n* = 147 | | *n* = 44 | |
| | *M* | *SD* | *M* | *SD* | *M* | *SD* |
| FFMQ Observe | 26.01 | 4.86 | 26.88 | 5.11 | 27.86 | 4.67 |
| FFMQ Describe | 26.71 | 5.51 | 28.01 | 5.17 | 26.11 | 7.70 |
| FFMQ Act (a, b) | 26.81 | 4.93 | 26.78 | 5.43 | 23.43 | 6.20 |
| FFMQ Nonjudge (a, b) | 28.33 | 5.28 | 28.77 | 5.84 | 22.68 | 6.05 |
| FFMQ Nonreact (a, b) | 21.39 | 4.15 | 21.66 | 3.53 | 19.36 | 4.08 |
| AAQ (a, b) | 33.25 | 6.51 | 32.73 | 6.15 | 38.09 | 7.51 |
| WBSI (a, b) | 47.20 | 10.06 | 48.27 | 9.64 | 57.39 | 7.60 |
| CISS Emotion (a, b) | 2.83 | .64 | 2.78 | .59 | 3.36 | .65 |
| CISS Avoidance | 3.35 | .58 | 3.31 | .55 | 3.20 | .45 |
| TAS-20 F1 (a, b) | 14.05 | 5.25 | 14.06 | 4.87 | 19.30 | 6.42 |
| TAS-20 F2 (a, b) | 12.59 | 4.33 | 12.16 | 4.36 | 14.91 | 4.72 |
| TAS-20 F3 | 20.02 | 4.16 | 19.36 | 4.83 | 19.48 | 5.05 |
| TMMS Attention | 49.72 | 7.14 | 49.65 | 7.82 | 50.09 | 7.13 |
| TMMS Clarity(a, b) | 39.79 | 7.43 | 41.01 | 6.98 | 35.55 | 8.16 |
| TMMS Repair (a, b) | 23.24 | 3.62 | 22.60 | 4.20 | 19.50 | 5.41 |

*Note*: M = mean; SD = standard deviation; FFMQ = Five Facet Mindfulness Questionnaire; AAQ = Acceptance and Action Questionnaire; WBSI = White Bear Suppression Inventory; CISS = Coping in Stressful Situations; TAS-20 = Toronto Alexithymia Scale - 20; TMMS = Trait Meta-Mood Scale; a = significant different between control and PTSD groups; b = significant difference between trauma-no PTSD and PTSD groups.

Table 3

*Cohen's d Calculated for Measures between Trauma Groups*

|  | *Group Differences* | |
|---|---|---|
|  | between control and PTSD | between trauma-no PTSD and PTSD |
|  | *d* (effect size) | *d* (effect size) |
| *Measures* | | |
| FFMQ Act | .63 (medium) | .63 (medium) |
| FFMQ Nonjudge | 1.0 (large) | 1.08 (large) |
| FFMQ Nonreact | .53 (medium) | .60 (medium) |
| AAQ | .75 (medium) | .83 (large) |
| WBSI | 1.07 (large) | .95 (large) |
| CISS Emotion-Oriented | .85 (large) | .93 (large) |
| TAS-20 F1 (identify) | 1.0 (large) | 1.0 (large) |
| TAS-20 F2 (describe) | .53 (medium) | .63 (medium) |
| TMMS Clarity | .58 (medium) | .75 (medium) |
| TMMS Repair | .90 (large) | .74 (medium) |

*Note*: FFMQ = Five Facet Mindfulness Questionnaire; AAQ = Acceptance and Action Questionnaire; WBSI = White Bear Suppression Inventory; CISS = Coping in Stressful Situations; TAS-20 = Toronto Alexithymia Scale - 20; TMMS = Trait Meta-Mood Scale.

*PTSD, Mindfulness, and Experiential Avoidance*

Hierarchical multiple regression analyses were conducted to examine the extent to which mindfulness measures predicted PTSD avoidance symptom severity beyond measures of experiential avoidance in the sample that met PDS PTSD criteria. We hypothesized that

mindfulness would account for additional variance in PTSD avoidance symptom severity beyond measures of experiential avoidance. Separate regression equations were derived for each experiential avoidance measure: AAQ, WBSI CISS, TAS-20, and TMMS. For each regression model, the experiential avoidance measure was entered into Block 1, and mindfulness (FFMQ) was entered into Block 2. PDS PTSD avoidance symptom severity was our DV.

In order to determine which mindfulness subscales to enter into the regression models, Pearson product-moment correlation coefficients were calculated between the measures in the PTSD sample. (See Table 4.) The experiential avoidance measures that correlated with PDS PTSD avoidance symptom severity were the AAQ ($r = .43$, $p < .01$), WBSI ($r = .49$, $p < .01$), CISS emotion-focused coping ($r = .37$, $p = .02$), TAS-20 Factor 1 (identify feelings; $r = .63$, $p < .01$), TMMS clarity ($r = -.37$, $p = .01$), and TMMS repair ($r = -.32$, $p = .03$). Contrary to our hypothesis, which was based on unpublished data, PDS avoidance symptom severity was not related to the FFMQ observe subscale in the PTSD sample ($r = -.55$, $p = 008$; Waltz & Thompson, 2007); instead, act with awareness was the only subscale that achieved significance ($r = -.40$, $p < .01$). Consequently, only this subscale was entered into the model for our mindfulness block. Because we were concerned about statistical power with our sample size ($n = 44$), we entered the two TMMS subscales into separate models.

Table 4

*Pearson Product-Moment Correlation Coefficients for PTSD Sample  (N = 44)*

| Measures | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. PDS Avoidance | - | | | | | | | | | | | | | | | |
| 2. FFMQ Observe | -.14 | - | | | | | | | | | | | | | | |
| 3. FFMQ Describe | -.19 | .23 | - | | | | | | | | | | | | | |
| 4. FFMQ Act | -.40** | .19 | .43** | - | | | | | | | | | | | | |
| 4. FFMQ Nonjudge | -.18 | .12 | .01 | .33* | - | | | | | | | | | | | |
| 6. FFMQ Nonreact | -.21 | .37* | .51** | .33* | .30* | - | | | | | | | | | | |
| 7. AAQ | .43** | -.18 | -.38* | -.56** | -.67** | -.46** | - | | | | | | | | | |
| 8. WBSI | .49** | -.15 | -.05 | -.43** | -.53** | -.33* | .54** | - | | | | | | | | |
| 9. CISS Emotion | .37* | -.15 | -.14 | -.44** | -.58** | -.53** | .65** | .56** | - | | | | | | | |
| 10. CISS Avoidance | .01 | -.06 | .02 | -.07 | .22 | -.07 | .10 | .10 | .17 | - | | | | | | |
| 11. TAS Factor 1 | .63** | -.06 | -.42** | -.60** | -.35* | -.22 | .57** | .45** | .47** | -.05 | - | | | | | |
| 12. TAS Factor 2 | .28 | -.25 | -.77** | -.39** | -.16 | -.48** | .42** | .23 | .16 | -.12 | .51** | - | | | | |
| 13. TAS Factor 3 | .20 | -.51** | -.57** | -.36* | .04 | -.26 | .21 | -.06 | .15 | .06 | .30* | .52** | - | | | |
| 14. TMMS Attention | -.24 | .55** | .29 | .20 | -.01 | .14 | -.12 | -.07 | -.12 | .04 | -.15 | -.31* | .-.53** | - | | |
| 15. TMMS Clarity | -.37* | .28 | .56** | .60** | .45** | .39** | -.59** | -.47** | -.32* | .02 | -.64** | -.70** | -.41** | .34* | - | |
| 16. TMMS Repair | -.32* | .07 | .26 | .36* | .40** | .53** | -.49** | -.24 | -.51** | .09 | -.36* | -.41** | -.15 | -.02 | .38* | - |

*Note*: FFMQ = Five Facet Mindfulness Questionnaire; AAQ = Acceptance and Action Questionnaire; WBSI = White Bear Suppression Inventory; CISS = Coping in Stressful Situations; TAS-20 = Toronto Alexithymia Scale – 20; TMMS = Trait Meta-Mood Scale; PDS = Posttraumatic Stress Diagnostic Scale.

 * $p < .05$
** $p < .01$

In the following set of 3 hierarchical multiple regression analyses, experiential avoidance predicted a significant portion of the variance of PTSD avoidance symptom severity, and experiential avoidance continued to individually explain a greater portion of the variance, even after mindfulness was entered into the model. Experiential avoidance was entered into the first step, and mindfulness was entered into the second step. We examined the degree to which experiential avoidance predicted PTSD avoidance symptom severity by itself, then examined the degree to which experiential avoidance and mindfulness entered together predicted PTSD avoidance symptoms severity, also examining whether the addition of mindfulness significantly increased the predictability of the model. Finally, we examined the ability of mindfulness and experiential avoidance to individually predict the variance in PTSD avoidance symptom severity when entered together. Because of the small sample, adjusted $R^2$ is reported.

The AAQ accounted for 17% of the variance [$F(1, 41) = 9.48$, $p < .01$] in the first step, but the AAQ and FFMQ together did not significantly predict PDS PTSD avoidance symptom severity beyond the AAQ by itself [$F$ Change$(1, 41) = 2.02$, $p = .16$; adjusted $R^2 = .19$]. Individually, within the larger model, the AAQ accounted for 6% (semipartial $R^2 = .06$) of the variance in PDS PTSD avoidance symptom severity and the FFMQ accounted for 4% (semipartial $R^2 = .04$). (See Table 5a.)

The WBSI accounted for 22% of the variance [$F(1, 42) = 13.31$, $p < .01$] in the first step, but the WBSI and FFMQ together did not significantly predict PDS PTSD avoidance symptom severity beyond the WBSI by itself [$F$ Change$(1, 41) = 2.56$, $p = .12$; adjusted $R^2 = .25$]. Individually, within the larger model, the WBSI accounted for 12% (semipartial $R^2 = .12$) of the

variance in the PDS PTSD avoidance symptom severity and the FFMQ accounted for 5%

(semipartial $R^2$ = .05). (See Table 5a.)

The TAS-20 Factor 1 (identify feelings) accounted for 38% of the variance [$F(1, 42)$ =

27.24, $p < .01$] in the first step, but the TAS- 20 and FFMQ together did not significantly predict

PDS PTSD avoidance symptom severity beyond the TAS-20 Factor 1 (identify feelings) by itself

[$F$ $Change(1, 41)$ = .07, $p$ = .79; adjusted $R^2$ = .37]. Individually, within the larger model, the

TAS-20 accounted for 23% (semipartial $R^2$ = .23) of the variance in the PDS PTSD avoidance

symptom severity and the FFMQ accounted for less than 1% (semipartial $R^2 < .00$). (See Table

5a.)

Table 5a

*Hierarchical Regression Analyses for PTSD Avoidance Symptoms in PTSD Sample*

|  | adj R² | B | SE B | β | p | semipart R² |
|---|---|---|---|---|---|---|
| Step 1: Experiential Avoidance | .17 |  |  |  |  |  |
| 1. AAQ |  | .28 | .09 | .43 | .01* | .18 |
|  |  |  |  |  |  |  |
| Step 2: Mindfulness | .19 |  |  |  |  |  |
| 1. AAQ |  | .19 | .11 | .30 | 08 | .06 |
| 2. FFMQ Act |  | -.19 | .13 | -.24 | .16 | .04 |
|  |  |  |  |  |  |  |
| Step 1: Experiential Avoidance | .22 |  |  |  |  |  |
| 1. WBSI |  | .31 | .09 | .49 | .01* | .24 |
|  |  |  |  |  |  |  |
| Step 2: Mindfulness | .25 |  |  |  |  |  |
| 1. WBSI |  | .25 | .09 | .39 | .01* | .12 |
| 2. FFMQ Act |  | -.18 | .12 | -.23 | .12 | .05 |
|  |  |  |  |  |  |  |
| Step 1: Experiential Avoidance | .38 |  |  |  |  |  |
| 1. TAS-20 F1 (identify feelings) |  | .48 | .09 | .63 | .01* | .39 |
|  |  |  |  |  |  |  |
| Step 2: Mindfulness | .37 |  |  |  |  |  |
| 1. TAS-20 F1 (identify feelings) |  | .46 | .12 | .60 | .01* | .23 |
| 2. FFMQ Act |  | -.03 | .12 | -.04 | .79 | .01 |

*Note:* AAQ = Acceptance and Action Questionnaire; WBSI = White Bear Suppression Inventory; TAS-20 = Toronto Alexithymia Scale – 20; FFMQ = Five Facet Mindfulness Questionnaire.
* *p* < .05

In the next set of 3 hierarchical multiple regression analyses, experiential avoidance predicted a significant portion of the variance of PTSD avoidance symptom severity, but, individually, mindfulness explained a greater portion of the variance than experiential avoidance when mindfulness was entered into the model. Experiential avoidance was entered into the first step, and mindfulness was entered into the second step. We examined the degree to which experiential avoidance predicted PTSD avoidance symptom severity by itself, then examined the degree to which experiential avoidance and mindfulness entered together predicted PTSD avoidance symptoms severity, also examining whether the addition of mindfulness significantly

increased the predictability of the model. Lastly, we examined the ability of mindfulness and experiential avoidance to individually predict the variance in PTSD avoidance symptom severity when entered together. Because of the small sample, adjusted $R^2$ is reported.

The CISS emotion-oriented coping subscale accounted for 12% of the variance [$F(1, 40)$ = 6.40, $p$ = .02] in the first step, but the CISS and FFMQ together did not significantly predict PDS PTSD avoidance symptom severity beyond the CISS by itself [$F\ Change(1, 39) = 3.46, p$ =.70; adjusted $R^2$ = .17]. Individually, within the larger model, the CISS accounted for 5% (semipartial $R^2$ = .05) of the variance in the PDS PTSD avoidance symptom severity and the FFMQ accounted for 7% (semipartial $R^2$ = .07). (See Table 5b.)

The TMMS clarity subscale accounted for 12% of the variance [$F(1, 42) = 6.70, p = .01$] in the first step, but the TMMS and FFMQ together did not significantly predict PDS PTSD avoidance symptom severity beyond the TMMS clarity subscale by itself [$F\ Change(1, 41) =$ 2.53, $p$ = .12; adjusted $R^2$ = .15]. Individually, within the larger model, the TMMS clarity subscale accounted for 3% (semipartial $R^2$ = .03) of the variance in the PDS PTSD avoidance symptom severity and the FFMQ accounted for 5% (semipartial $R^2$ = .05). (See Table 5b.)

The TMMS repair subscale accounted for 8% of the variance [$F(1, 42) = 4.90, p = .03$] in the first step, and the TMMS and FFMQ together significantly predicted PDS PTSD avoidance symptom severity beyond the TMMS repair subscale by itself [$F\ Change(1, 41) = 4.81, p = .03$; adjusted $R^2$ = .16]. Individually, within the larger model, the TMMS repair subscale accounted for 4% (semipartial $R^2$ = .04) of the variance in the PDS PTSD avoidance symptom severity and the FFMQ accounted for 9% (semipartial $R^2$ = .09). (See Table 5b.)

Table 5b

*Hierarchical Regression Analyses for PTSD Avoidance Symptoms in PTSD Sample*

| | adj R² | B | SE B | β | p | semipart R² |
|---|---|---|---|---|---|---|
| Step 1: Experiential Avoidance | .12 | | | | | |
| 1. CISS Emotion-Oriented | | 2.80 | 1.11 | .37 | .02* | .14 |
| | | | | | | |
| Step 2: Mindfulness | .17 | | | | | |
| 1. CISS Emotion-Oriented | | 1.81 | 1.20 | .24 | .14 | .05 |
| 2. FFMQ Act | | -.23 | .13 | -.30 | .07 | .07 |
| | | | | | | |
| Step 1: Experiential Avoidance | .12 | | | | | |
| 1. TMMS Clarity | | -.22 | .09 | -.37 | .01* | .14 |
| | | | | | | |
| Step 2: Mindfulness | .15 | | | | | |
| 1. TMMS Clarity | | -.12 | .11 | -.20 | .26 | .03 |
| 2. FFMQ Act | | -.22 | .14 | -.28 | .12 | .05 |
| | | | | | | |
| Step 1: Experiential Avoidance | .08 | | | | | |
| 1. TMMS Repair | | -.29 | .13 | -.32 | .03* | .10 |
| | | | | | | |
| Step 2: Mindfulness | .16 | | | | | |
| 1. TMMS Repair | | -.19 | .14 | -.21 | .18 | .04 |
| 2. FFMQ Act | | -.26 | .12 | -.33 | .03* | .09 |

*Note:* CISS = Coping in Stressful Situations; TMMS = Trait Meta-Mood Scale; FFMQ = Five Facet Mindfulness Questionnaire.
* $p < .05$

In summary, all models including experiential avoidance and mindfulness predicted a substantial amount of the variance in PTSD avoidance symptom severity, but only in one case (TMMS repair subscale) was the increase in predictive power statistically significant. With the exception of the TAS-20, the FFMQ act with awareness scale accounted for some additional individual variance when entered after measures of experiential avoidance, and in three models (i.e., CISS emotion-oriented coping, TMMS clarity, and TMMS repair subscale) it accounted for more of the variance than experiential avoidance (CISS emotion-oriented coping, TMMS clarity, and TMMS repair subscale). Consequently, mindfulness appears to offer some degree of predictive power for PTSD avoidance symptom severity.

*Avoidance Symptom Severity, Mindfulness, and Experiential Avoidance in a Traumatized Sample*

We were interested in looking at the relationship between mindfulness, experiential avoidance, and PTSD avoidance symptom severity in a sample of people who had experienced a traumatic event, including both those who developed PTSD and those who did not. Consequently, the trauma-no PTSD (*n* = 147) and PTSD (*n* = 44) samples were combined into one sample that we labeled *traumatized* (*n* = 191). It should be noted that the criteria for our traumatized group were different from what has been called "subthreshold" or "partial" PTSD, which tends to focus on impairment (Stein, Walker, Hazen, & Forde, 1997; Yarvis, Bordnick, Spivey, & Pedlar, 2005; Zlotnick, Franklin, & Zimmerman, 2002). We were interested in a broader range of PTSD symptoms than the use of impairment as a criterion would likely yield; consequently, it is probable that our traumatized sample endorsed less distress than those studied in subthreshold and partial PTSD research.

Pearson product-moment correlation coefficients for mindfulness, experiential avoidance, and PTSD avoidance symptom severity were computed for the traumatized sample. (See Table 6.) Patterns of correlations in the traumatized sample were similar to the PTSD sample with three exceptions in relation to PDS PTSD avoidance symptom severity: in addition to the FFMQ act with awareness subscale (*r* = .33, *p* <.01), PDS avoidance symptom severity was significantly correlated with FFMQ nonjudgment (*r* = -.26, *p* = .03) and nonreactivity (*r* = -.26, *p* = .03) subscales. Also, in addition to the TAS-20 Factors 1 (identify feelings; *r* = .62, *p* < .01), PDS PTSD avoidance symptom severity was significantly correlated with Factor 2 (describe feelings; *r* = .32, *p* < .01).

Table 6

*Pearson Product-Moment Correlation Coefficients for Traumatized Sample  (N = 191)*

| Measures | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. PDS Avoidance | - | | | | | | | | | | | | | | | |
| 2. FFMQ Observe | .05 | - | | | | | | | | | | | | | | |
| 3. FFMQ Describe | -.18* | .21** | - | | | | | | | | | | | | | |
| 4. FFMQ Act | -.32** | -.01 | .36** | - | | | | | | | | | | | | |
| 4. FFMQ Nonjudge | -.37** | -.11 | .13 | .33** | - | | | | | | | | | | | |
| 6. FFMQ Nonreact | -.20** | .26** | .20** | .28** | .19** | - | | | | | | | | | | |
| 7. AAQ | .34** | -.06 | -.37** | -.48** | -.57** | -.40** | - | | | | | | | | | |
| 8. WBSI | .42** | .18* | -.17* | -.44** | -.52** | -.24** | .49** | - | | | | | | | | |
| 9. CISS Emotion | .39** | .05 | -.18* | -.47** | -.58** | -.44** | .66** | .62** | - | | | | | | | |
| 10. CISS Avoidance | -.03 | .07 | .016* | -.12 | .03 | -.08 | .08 | -.07 | .17* | - | | | | | | |
| 11. TAS Factor 1 | .48** | .11 | -.36** | -.48** | -.44** | -.24** | .45** | .50** | .54** | -.03 | - | | | | | |
| 12. TAS Factor 2 | .32** | -.07 | -.73** | -.40** | -.30** | -.08 | .40** | .33** | .29** | -.16* | .45** | - | | | | |
| 13. TAS Factor 3 | .05 | -.21** | -.40** | -.28** | -.04 | -.18* | .26** | .06 | .16* | -.05 | .22** | .36** | - | | | |
| 14. TMMS Attention | -.03 | .21** | .30** | .13 | .17* | -.03 | -.19** | -.01 | -.07 | .18* | -.09 | -.31** | -.52** | - | | |
| 15. TMMS Clarity | -.36** | .12 | .59** | .49** | .49** | .28** | -.55** | -.41** | -.46** | -.002 | -.67** | -.68** | -.40** | .31* | - | |
| 16. TMMS Repair | -.29** | .06 | .24** | .31** | .41** | .34** | -.39** | -.30** | -.44** | .22** | -.31** | -.36** | -.18* | .26** | .35** | - |

*Note*: FFMQ = Five Facet Mindfulness Questionnaire; AAQ = Acceptance and Action Questionnaire; WBSI = White Bear Suppression Inventory; CISS = Coping in Stressful Situations; TAS-20 = Toronto Alexithymia Scale – 20; TMMS = Trait Meta-Mood Scale; PDS = Posttraumatic Stress Diagnostic Scale.

 * *p* < .05
** *p* < .01

Hierarchical multiple regression analyses were conducted to test the extent to which mindfulness predicted the variance in PTSD avoidance symptom severity above and beyond experiential avoidance measures within the traumatized sample. For each analysis, the experiential avoidance measure was entered into Block 1, and the four FFMQ subscales (i.e., describe, act with awareness, nonjudgment, and nonreactivity subscales) that correlated significantly with PDS PTSD avoidance symptom severity were entered into Block 2. PDS PTSD avoidance symptom severity was the dependent variable. Both of the significant TAS-20 (i.e., Factor 1 and Factor 2) and TMMS (i.e., clarity and repair) subscales were each entered into the first step of their respective models rather than in separate models, as had been done with the two TMMS subscales when regression models were computed with the PTSD sample.

In the following two regression analyses, in which the WBSI and TAS-20 were entered as the experiential avoidance measures, more of the variance in PTSD avoidance symptom severity was predicted individually by experiential avoidance than mindfulness.

The WBSI accounted for 18% of the variance [$F(1, 185) = 40.45$, $p < .01$] in the first step. Together, the WBSI and FFMQ significantly predicted PDS PTSD avoidance symptom severity more than the WBSI by itself [$F\ Change(4, 181) = 3.16$, $p = .02$; adjusted $R^2 = .21$]. See Table 7a for the individual contributions of each scale towards accounting for PDS PTSD avoidance symptom severity within the larger model.

The TAS-20 (identify feelings and describe feelings subscales) accounted for 24% of the variance [$F(2, 187) = 30.17$, $p < .01$] in the first step. Together, the TAS-20 and FFMQ significantly predicted the variance in PDS PTSD avoidance symptom severity more than the TAS-20 itself [$F\ Change(4, 183) = 2.70$, $p = .03$; adjusted $R^2 = .26$]. See Table 7a for the

individual contributions of each scale towards accounting for PDS PTSD avoidance symptom severity within the larger model.

Table 7a

*Hierarchical Regression Analyses for PTSD Avoidance Symptoms in Traumatized Sample*

|  | adj R² | B | SE B | β | p | semipart R² |
|---|---|---|---|---|---|---|
| Step 1: Experiential Avoidance | .18 |  |  |  |  |  |
| 1. WBSI |  | .20 | .03 | .42 | <.01* | .18 |
|  |  |  |  |  |  |  |
| Step 2: Mindfulness | .21 |  |  |  |  |  |
| 1. WBSI |  | .12 | .04 | .26 | <.01* | .04 |
| 2. FFMQ Describe |  | -.05 | .06 | -.06 | .40 | <.01 |
| 3. FFMQ Act |  | -.08 | .06 | -.11 | .18 | <.01 |
| 4. FFMQ Nonjudge |  | -.13 | .06 | -.18 | .02* | .02 |
| 5. FFMQ Nonreact |  | -.07 | .08 | -.06 | .39 | <.01 |
|  |  |  |  |  |  |  |
| Step 1: Experiential Avoidance | .24 |  |  |  |  |  |
| 1. TAS-20 F1 (identify) |  | .34 | .06 | .42 | <.01* | .14 |
| 2. TAS-20 F2 (describe) |  | .13 | .07 | .13 | .08 | .01 |
|  |  |  |  |  |  |  |
| Step 2: Mindfulness | .26 |  |  |  |  |  |
| 1. TAS-20 F1 (identify) |  | .26 | .06 | .33 | <.01* | .07 |
| 2. TAS-20 F2 (describe) |  | .20 | .10 | .20 | .05* | .02 |
| 3. FFMQ Describe |  | .11 | .07 | .14 | .14 | .01 |
| 4. FFMQ Act |  | -.05 | .06 | -.06 | .41 | <.01 |
| 6. FFMQ Nonjudge |  | -.11 | .05 | -.15 | .04* | .02 |
| 6. FFMQ Nonreact |  | -.10 | .08 | -.09 | .21 | .01 |

*Note:* WBSI = White Bear Suppression Inventory; TAS-20 = Toronto Alexithymia Scale - 20; FFMQ = Five Facet Mindfulness Questionnaire.
* $p < .05$

In the remaining analyses, mindfulness individually explained more of the variance of PTSD avoidance symptom severity than experiential avoidance when entered together. In these analyses, the AAQ, CISS emotion oriented coping subscale, and the TMMS were entered as the experiential avoidance measures.

The AAQ accounted for 11% of the variance [$F(1, 88) = 25.24$, $p < .01$] in the first step. Together, the AAQ and FFMQ significantly predicted the variance in PDS PTSD avoidance

symptom severity more than the AAQ by itself [*F Change*(4, 184) = 4.26, $p < .01$; adjusted $R^2$ = .17]. See Table 7b for the individual contributions of each scale towards accounting for PDS PTSD avoidance symptom severity within the larger model.

The CISS emotion-oriented coping subscale accounted for 15% of the variance [$F(1, 175) = 31.81$, $p < .01$] in the first step. Together, the CISS emotion-oriented coping subscale and FFMQ together significantly predicted PDS PTSD avoidance symptom severity more than the CISS emotion-oriented coping subscale by itself [*F Change*(4, 171) = 2.93, $p = .02$; adjusted $R^2$ = .19]. See Table 7b for the individual contributions of each scale towards accounting for PDS PTSD avoidance symptom severity within the larger model.

The TMMS (clarity and repair subscales) accounted for 15% of the variance [$F(2, 187) = 17.98$, $p < .01$] in the first step. Together, the TMMS and FFMQ together significantly predicted the variance in PDS PTSD avoidance symptom severity more than the TMMS itself [*F Change*(4, 183) = 2.86, $p = .03$; adjusted $R^2$ = .19]. See Table 7b for the individual contributions of each scale towards accounting for PDS PTSD avoidance symptom severity within the larger model.

Table 7b

*Hierarchical Regression Analyses for PTSD Avoidance Symptoms in Traumatized Sample*

| | adj R² | B | SE B | β | p | semipart R² |
|---|---|---|---|---|---|---|
| Step 1: Experiential Avoidance | .11 | | | | | |
| 1. AAQ | | .23 | .05 | .34 | <.01* | .12 |
| | | | | | | |
| Step 2: Mindfulness | .17 | | | | | |
| 1. AAQ | | .05 | .06 | .08 | .41 | <.01 |
| 2. FFMQ Describe | | -.03 | .06 | -.04 | .57 | <.01 |
| 3. FFMQ Act | | -.13 | .06 | -.17 | .04* | .02 |
| 4. FFMQ Nonjudge | | -.18 | .06 | -.25 | <.01* | .04 |
| 5. FFMQ Nonreact | | -.08 | .09 | -.06 | .39 | <.01 |
| | | | | | | |
| Step 1: Experiential Avoidance | .15 | | | | | |
| 1. CISS Emotion-Oriented | | 2.76 | .49 | .39 | <.01* | .15 |
| | | | | | | |
| Step 2: Mindfulness | .19 | | | | | |
| 1. CISS Emotion-Oriented | | 1.34 | .68 | .19 | .05* | .02 |
| 2. FFMQ Describe | | -.05 | .06 | -.06 | .39 | <.01 |
| 3. FFMQ Act | | -.11 | .07 | -.13 | .11 | .01 |
| 4. FFMQ Nonjudge | | -.15 | .06 | -.20 | .02* | .03 |
| 5. FFMQ Nonreact | | -.03 | .09 | -.02 | .75 | <.01 |
| | | | | | | |
| Step 1: Experiential Avoidance | .15 | | | | | |
| 1. TMMS Clarity | | -.18 | .04 | -.30 | <.01* | .08 |
| 2. TMMS Repair | | -.18 | .07 | -.18 | .01* | .03 |
| | | | | | | |
| Step 2: Mindfulness | .19 | | | | | |
| 1. TMMS Clarity | | -.10 | .06 | -.17 | .09 | .01 |
| 2. TMMS Repair | | -.10 | .08 | -.10 | .20 | .01 |
| 3. FFMQ Describe | | .03 | .07 | .03 | .71 | <.01 |
| 4. FFMQ Act | | -.11 | .06 | .14 | .08 | .01 |
| 5. FFMQ Nonjudge | | -.14 | .06 | .20 | .02* | .03 |
| 6. FFMQ Nonreact | | -.05 | .09 | -.05 | .53 | <.01 |

*Note:* AAQ = Acceptance and Action Questionnaire; CISS = Coping in Stressful Situations; TMMS = Trait Meta-Mood Scale; FFMQ = Five Facet Mindfulness Questionnaire.
* *p* < .05

Lastly, we entered all the relevant experiential avoidance and mindfulness variables into one hierarchical multiple regression analysis. Experiential avoidance was entered into the first step, and mindfulness was entered into the second step. Experiential avoidance accounted for 26% of the variance [$F(7, 167) = 10.01$, $p < .01$] in the first step. However, experiential avoidance and mindfulness together did not significantly predict the variance in PDS PTSD avoidance symptom severity any more than experiential avoidance  by itself [$F$ *Change*$(4, 163) = .63$, $p = .64$; adjusted $R^2 = .26$]. See Table 7c for the individual contributions of each scale towards accounting for PDS PTSD avoidance symptom severity within the larger model.

Table 7c

*Hierarchical Regression Analyses for PTSD Avoidance Symptoms in Traumatized Sample*

| | adj R² | B | SE B | β | p | semipart R² |
|---|---|---|---|---|---|---|
| Step 1: Experiential Avoidance | .27 | | | | | |
| 1. AAQ | | .03 | .06 | .05 | .61 | <.01 |
| 2. WBSI | | .09 | .04 | .19 | .03* | .02 |
| 3. CISS Emotion-Oriented | | .26 | .73 | .04 | .72 | <.01 |
| 4. TAS-20 F1 | | .25 | .08 | .32 | <.01* | .05 |
| 5. TAS-20 F2 | | .09 | .09 | .09 | .31 | <.01 |
| 6. TMMS Clarity | | .03 | .07 | .06 | .61 | <.01 |
| 7. TMMS Repair | | -.08 | .07 | -.09 | .26 | <.01 |
| | | | | | | |
| Step 2: Mindfulness | .26 | | | | | |
| 1. AAQ | | .02 | .07 | .03 | .76 | <.01 |
| 2. WBSI | | .07 | .04 | .16 | .08 | .01 |
| 3. CISS Emotion-Oriented | | -.06 | .77 | -.01 | .94 | <.01 |
| 4. TAS-20 F1 | | .25 | .08 | .31 | <.01* | .05 |
| 5. TAS-20 F2 | | .18 | .11 | .18 | .12 | .01 |
| 6. TMMS Clarity | | .04 | .07 | .07 | .53 | <.01 |
| 7. TMMS Repair | | -.06 | .08 | -.06 | .46 | <.01 |
| 8. FFMQ Describe | | .08 | .08 | .11 | .32 | <.01 |
| 9. FFMQ Act | | -.02 | .07 | -.03 | .75 | <.01 |
| 10. FFMQ Nonjudge | | -.06 | .07 | -.09 | .33 | <.01 |
| 11. FFMQ Nonreact | | -.07 | .10 | -.06 | .46 | <.01 |

*Note:* FFMQ = Five Facet Mindfulness Questionnaire; AAQ = Acceptance and Action Questionnaire; WBSI = White Bear Suppression Inventory; CISS = Coping in Stressful Situations; TAS-20 = Toronto Alexithymia Scale – 20; TMMS = Trait Meta-Mood Scale.
* $p < .05$

In summary, for the traumatized sample, when measures of experiential avoidance were entered individually into separate multiple regression models with mindfulness, mindfulness and experiential avoidance together significantly contributed to predicting the variance in PTSD symptom severity more than experiential avoidance alone. Of the four mindfulness subscales entered in each model, the FFMQ nonjudgment subscale was significant across all separate regression models. When experiential avoidance and mindfulness were all entered into one multiple regression model, mindfulness did not significantly contribute to predicting additional variance in PTSD avoidance symptom severity. However, it is worth noting that all the

experiential avoidance measures entered together in this latter model only accounted for 26% of

the variance, the same amount as the TAS-20 and FFMQ combined. See Table 8 for a summary

of the results from the regression analyses.

Table 8

*Summary of Adjusted R² and Semipartial R² for PTSD and Traumatized Groups*

|  | PTSD group | | Traumatized group | |
| --- | --- | --- | --- | --- |
|  | adj $R^2$ | semipart $R^2$ | adj $R^2$ | semipart $R^2$ |
| Measures: | | | | |
| AAQ | .17 | .06 | .11 | <.01 |
| FFMQ | .19 | .04 | .17* | .06 |
| | | | | |
| WBSI | .22 | .12 | .18 | .04 |
| FFMQ | .25 | .05 | .21* | .02 |
| | | | | |
| CISS | .12 | .05 | .15 | .02 |
| FFMQ | .17 | .07 | .19* | .04 |
| | | | | |
| TAS-20 | .38 | .23 | .34 | .09 |
| FFMQ | .37 | .01 | .36* | .04 |
| | | | | |
| TMMS Clarity | .12 | .03 | - | - |
| FFMQ | .15 | .05 | - | - |
| | | | | |
| TMMS Repair | .08 | .04 | - | - |
| FFMQ | .16* | .09 | - | - |
| | | | | |
| TMMS | - | - | .15 | .02 |
| FFMQ | - | - | .19* | .04 |

*Note:* FFMQ = Five Facet Mindfulness Questionnaire; AAQ = Acceptance and Action
Questionnaire; WBSI = White Bear Suppression Inventory; CISS = Coping in Stressful
Situations; TAS-20 = Toronto Alexithymia Scale – 20; TMMS = Trait Meta-Mood Scale.
* indicates a significant increase in prediction of the variance in PTSD symptom severity when
the FFMQ was added in the second step of the regression analysis.

*Experiential Avoidance and Mindfulness as Predictors of PTSD Status*

In addition to examining predictors of PTSD avoidance symptom severity, we were also interested in examining the ability of mindfulness to predict whether an individual meets PTSD criteria. In particular, we were interested in the ability of mindfulness and experiential avoidance to predict PTSD criteria in a traumatized sample. A hierarchical logistic regression analysis was employed to examine the ability of measures of mindfulness and experiential avoidance to predict accurately how many participants in the traumatized sample ($n = 191$) met PDS PTSD criteria.

The presence or absence of PTSD, as measured by the PDS, was entered as a binary construct for the dependent variable. All measures of experiential avoidance (AAQ, WBSI, CISS, TAS-20, TMMS) were entered into the first block and mindfulness (all 5 FFMQ subscales) was entered into the second block.

The combination of all measures of experiential avoidance significantly predicted 94.7% of the trauma-no PTSD and 48.7% of the PTSD groups, with an overall percentage of 84.2% [$\chi^2(10, N = 191) = 51.25, p < .01$]. The combination of experiential avoidance and mindfulness significantly predicted 95.5% of the trauma-no PTSD and 53.8% of the PTSD groups, with an overall percentage of 86.0% [$\chi^2(15, N = 191) = 56.90, p < .01$]. As seen in Table 9, only the FFMQ nonreactivity subscale ($p = .05$) was significantly predictive within the full model. Together, experiential avoidance and mindfulness were able distinguish more than 50% of individuals with PTSD from the traumatized sample.

Table 9

_Hierarchical Logistic Regression Predicting PTSD in Traumatized Sample (n = 191)_

| | B | SE B | Wald $\chi^2$ | p | OR |
|---|---|---|---|---|---|
| Step 1: Experiential Avoidance | | | | | |
| 1. AAQ | -.00 | .05 | .00 | .98 | 1.0 |
| 2. WBSI | .07 | .04 | 4.12 | .04* | 1.08 |
| 3. CISS Emotion-Oriented | 1.14 | .60 | 3.59 | .06 | 3.12 |
| 4. CISS Avoidance | -.98 | .51 | 3.78 | .05* | .37 |
| 5. TAS-20 F1 | .06 | .06 | 1.5 | .31 | 1.06 |
| 6. TAS-20 F2 | .08 | .07 | 1.27 | .26 | 1.09 |
| 7. TAS-20 F3 | -.05 | .06 | .76 | .38 | .95 |
| 8. TMMS Attention | .04 | .04 | 1.19 | .28 | 1.04 |
| 9. TMMS Clarity | -.01 | .05 | .01 | .92 | 1.0 |
| 10. TMMS Repair | -.01 | .05 | .04 | .85 | .99 |
| | | | | | |
| Step 2: Mindfulness | | | | | |
| 1. AAQ | -.01 | .05 | .07 | .79 | .99 |
| 2. WBSI | .06 | .04 | 2.8 | .09 | 1.07 |
| 3. CISS Emotion-Oriented | .68 | .65 | 1.08 | .30 | 1.97 |
| 4. CISS Avoidance | 0.96 | .53 | 3.33 | .07 | .38 |
| 5. TAS-20 F1 | .07 | .06 | 1.23 | .27 | 1.07 |
| 6. TAS-20 F2 | .16 | .09 | 3.19 | .07 | 1.18 |
| 7. TAS-20 F3 | -.05 | .06 | .55 | .46 | .96 |
| 8. TMMS Attention | .02 | .04 | .25 | .62 | 1.02 |
| 9. TMMS Clarity | .02 | .06 | .09 | .76 | 1.02 |
| 10. TMMS Repair | .03 | .06 | .23 | .64 | 1.03 |
| 11. FFMQ Observe | .02 | .06 | .11 | .74 | 1.02 |
| 12. FFMQ Describe | .07 | .06 | 1.29 | .26 | 1.07 |
| 13. FFMQ Act | -.02 | .05 | .14 | .70 | .98 |
| 14. FFMQ Nonjudge | -.05 | .05 | 1.02 | .31 | .95 |
| 15. FFMQ Nonreact | -.15 | .08 | 3.76 | .05* | .89 |

Step 1 classification table:

| group | | | |
|---|---|---|---|
| | trauma-no PTSD | PTSD | % correct |
| trauma-no PTSD | 125 | 7 | 94.7% |
| PTSD | 20 | 19 | 48.7% |
| Overall % | | | 84.2% |

Step 2 classification table:

| group | | | |
|---|---|---|---|
| | trauma-no PTSD | PTSD | % correct |
| trauma-no PTSD | 126 | 6 | 95.5% |
| PTSD | 18 | 21 | 53.8% |
| Overall % | | | 86.0% |

_Note_: FFMQ = Five Facet Mindfulness Questionnaire; AAQ = Acceptance and Action Questionnaire; WBSI = White Bear Suppression Inventory; CISS = Coping in Stressful Situations; TAS-20 = Toronto Alexithymia Scale – 20; TMMS = Trait Meta-Mood Scale; PDS = Posttraumatic Stress Diagnostic Scale.
* $p < .05$

Discussion

The overarching hypothesis for this study was that the construct of mindfulness would offer additional insight into explaining the variance in PTSD avoidance symptom severity within the context of an experiential avoidance model of understanding PTSD. The hypothesis was partially supported. Mindfulness appears to predict PTSD avoidance symptom severity uniquely, but the predictive power varies according to the experiential avoidance measures with which it is paired. We looked at two groups: one group met PTSD criteria according to the PDS, and the second, our traumatized group, endorsed a criterion A trauma but included both people who met PTSD criteria and those who did not.

In the PTSD group, the tendency to act with awareness during everyday life was the only aspect of mindfulness that was significantly related to PTSD symptoms. When combined with measures of experiential avoidance, mindfulness did not significantly account for additional variance in PTSD avoidance symptom severity more than experiential avoidance alone. However, within the combined models, mindfulness individually accounted for more of the variance than emotional coping and emotional intelligence. These results are somewhat tentative, given the low sample size ($n = 44$) for the analyses. That mindfulness did not contribute any additional significant predictive power may be partially explained by relatively low statistical power, especially as all the models in the larger traumatized group discussed in the following paragraph reached significance.

In the traumatized group, mindfulness, particularly the tendency towards nonjudgment of one's experiences, significantly predicted a greater degree of the variance in PTSD avoidance symptom severity when combined with measures of experiential avoidance than experiential avoidance alone.  Within the combined models, mindfulness individually predicted a greater

degree of the variance than emotional coping, emotional intelligence, and a general measure of experiential avoidance (AAQ). This finding suggests that mindfulness significantly contributes to understanding the variance in PTSD avoidance symptom severity above and beyond experiential avoidance alone, and that mindfulness may be a more powerful predictor of the variance in PTSD avoidance symptom severity than emotional coping, emotional intelligence, and the AAQ.

Although not one of our original hypotheses, we looked at whether scores on measures of experiential avoidance and mindfulness would predict the likelihood that an individual met criteria for a PTSD diagnosis. In the traumatized sample, mindfulness predicted an additional 5% of people with PTSD compared to experiential avoidance alone. Moreover, when measures of experiential avoidance and mindfulness were combined, only mindfulness, specifically the tendency to engage unpleasant experiences nonreactively, remained a significant predictor of PTSD.

Lastly, as predicted, individuals with PTSD scored significantly higher on measures of experiential avoidance, and significantly lower on measures of emotional intelligence and mindfulness, than individuals without PTSD. It is worth noting, moreover, that there were no significant differences in scores on measures of mindfulness and experiential avoidance between participants with no reported trauma history and those who reported at least one prior trauma but who did not meet PTSD criteria. Put another way, traumatized individuals who did not meet PTSD criteria scored more similarly on experiential avoidance and mindfulness than individuals with no reported trauma history than to those with PTSD.

The results of this study highlight the fact that how a multifaceted construct such as experiential avoidance is conceptualized and measured affects the conclusions one can draw

about its relationship to PTSD avoidance symptom severity. The majority of these measures were neither developed as part of the experiential avoidance literature, nor with a trauma population. Only the AAQ was created specifically as a measure of experiential avoidance, whereas the WBSI, TAS-20, and CISS were suggested ex post facto as measures of experiential avoidance by ACT proponents (see Hayes et al., 2004; Walser & Hayes, 1998). These results offer some direction in choosing measures of experiential avoidance that are particularly appropriate to the study of posttraumatic symptoms. These measures are discussed in more detail in the following sections.

*Alexithymia*

Our findings are consistent with previous research on alexithymia. Among the experiential avoidance measures, the TAS-20, especially Factor 1 (the ability to identify feelings), was the single most powerful predictor of the variance in PTSD avoidance symptom severity, with Factor 1 by itself predicting 38% of the variance in the PTSD sample and Factor 1 and Factor 2 combined predicting 24% in the traumatized group. None of the other measures exhibited as much difference in predictive power between the two groups. This suggests that the TAS-20 captures PTSD avoidance symptoms in a particularly robust way. The strength of the relationship between posttraumatic symptoms and the TAS-20 Factor 1 is consistent with the findings of Söndergaard and Theorell (2004), who found the strongest relationship with the Factor 1, a smaller relationship with Factor 2 (describe feelings), and no relationship with Factor 3 (externally oriented). By contrast, Monson et al. (2004) found that only Factor 3 predicted PTSD symptoms, which was not replicated in our findings. Perhaps the relationship between PTSD and alexithymia varies across what measure is used to assess PTSD.

Despite the well-established research linking alexithymia and PTSD, the precise relationship between these variables remains unclear. Although there is some evidence that alexithymic individuals may be more likely than non-alexithymic individuals to develop PTSD after a trauma exposure (Kosten, Krystal, Giller, Frank, & Dan, 1992), other evidence suggests that higher levels of alexithymia are associated with the emotional numbing element of PTSD (Badura, 2003; Fukunishi, Sasaki, Chishima, Anze, & Saijo, 1996), but not more effortful avoidance, which researchers have interpreted as indicating that alexithymia is only relevant to part of the criterion C symptoms reflecting emotional numbing (Frewen et al., 2008). The item content of the TAS-20 Factor 1 focuses on feeling out of touch with somatic and emotional experiences (e.g., "I have feelings that I can't quite identify"). Perhaps the reason the association between the TAS-20 and PTSD is so strong is that the experiences captured in the TAS-20 are similar to those that drive PTSD avoidance symptomatology—possibly emotional numbing, in particular--and in ways that are unique from items comprising the other measures used in this study.

*Thought Suppression*

The results of this study are also consistent with research that has found a relationship between thought suppression and PTSD symptom severity (Mayou, Ehlers, & Bryant, 2002; Steil & Ehlers, 2000). After the TAS-20, the WBSI was the second best predictor of PTSD avoidance symptom severity, predicting 22% of the variance in the PTSD sample and 18% in the traumatized sample when entered by itself. The use of thought suppression to manage distressing posttraumatic symptoms may serve to make these thoughts more salient, creating a rebound effect and maintaining PTSD symptom severity (e.g., Shipherd & Beck, 2005; Tull, Gratz, Salters, & Roemer, 2004). Surprisingly, despite the strength of our findings between the WBSI

and trauma, there is very little published research using the WBSI in trauma/PTSD samples.

Most of the research studying thought suppression and PTSD has employed thought suppression

tasks or other thought suppression measures (e.g., Shipherd & Beck, 2005; Steil & Ehlers, 2000).

The few studies that have employed the WBSI have found that it explained a significant portion

of the variance of total PTSD symptom severity and mediated the relationship between PTSD

and negative mood, even when general psychiatric symptom distress was accounted for

(Rosenthal, Cheavens, Lynch, & Follette, 2006; Tull, Gratz, Salters, & Roemer, 2004). These

past studies as well as the current results suggest that the WBSI may be a particularly useful

measure of experiential avoidance in PTSD samples.

*The Acceptance and Action Questionnaire*

In contrast to the TAS-20 and WBSI, the AAQ may not be a particularly useful measure

of experiential avoidance in trauma samples. Our results suggest that the AAQ is a weaker

predictor of PTSD avoidance symptom severity than the WBSI and TAS-20, and other studies

have found that the relationship between the AAQ and PTSD symptom severity disappears

entirely when general psychiatric distress is accounted for in the model (Morina, 2007; Tull,

Gratz, Salters, & Roemer, 2004). The AAQ may be too broad a measure to uniquely account for

posttraumatic symptoms (Morina, 2007; Tull, Gratz, Salters, & Roemer, 2004). Because no

measure of general distress was administered in this study, it is impossible to predict if the

FFMQ would exhibit the same pattern as the AAQ, but it is worth examining in future research,

as the predictive power of mindfulness in explaining the variance in avoidance symptoms

continues to be explored.

*Emotional Intelligence*

The relationships between PTSD avoidance symptom severity and emotional intelligence (TMMS), a construct related to alexithymia, were smaller than that of alexithymia. Moreover, the TMMS individually accounted for less of the variance in PTSD avoidance symptom severity than mindfulness, when mindfulness was also entered. We could find no other studies that have administered the TMMS with a trauma population. Although the clarity and repair subscales exhibited some relationship to trauma symptoms, the TMMS appears to be a less useful measure of emotional intelligence than the TAS-20 in trauma samples.

*Coping Skills*

A similar pattern was found for our measure of coping skills. By itself, the CISS emotional coping subscale predicted a significant degree of the variance in PTSD avoidance symptom severity, but it individually predicted less of the variance in avoidance symptom severity than mindfulness when combined together. The results are consistent with the only study that administered the CISS to a trauma population, which found that trauma survivors tend to use an emotional coping style (Borys & Majkowicz, 2005). It is interesting to note that the CISS avoidance coping subscale was not significantly related to PTSD avoidance symptom severity, but that it significantly predicted PTSD status in the logistic regression models, whereas emotional coping did not. One would expect that—conceptually, at least—avoidant coping would be associated with PTSD avoidance symptoms, as avoidant coping has been associated with general PTSD symptom severity across several studies (e.g., Dempsey, Overstreet, & Moely, 2000; Gil, 2005; Scarpa, Haden, & Hurley, 2006). None of these studies used the CISS, however, and there is not necessarily a standard definition of what "avoidant coping" is. The items of the avoidant coping subscale of the CISS reflect more externally-oriented and concrete

actions (e.g., "Window shop" or "Phone a friend"), whereas the emotional coping subscale reflects more internal experiences (e.g., "Become very tense" or "Get angry"). As the AAQ may be too broad a measure of experiential avoidance to be used in trauma samples, perhaps the CISS avoidant coping subscale is too narrow to fully capture the variance in PTSD avoidance symptom severity, which tends to reflect internal experiences, at least as it is captured by the PDS.

*Explaining Posttraumatic Symptoms with Experiential Avoidance*

As has already been noted, experiential avoidance is an umbrella term that includes alexithymia, thought suppression, avoidant coping, and low emotional intelligence (Hayes et al., 2004; Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). This study is the first to examine the ability of several measures of different aspects of experiential avoidance to predict the variance in PTSD avoidance symptom severity. Just as experiential avoidance is made up of various facets, PTSD avoidance symptoms also consist of several different elements: deliberate efforts to avoid experiences related to or that arouse memories of the traumatic event (C1, C2); difficulty remembering events related to the traumatic event (C3); emotional numbing, which may include lack of interest in previously pleasurable activities, a feeling of distance from others, and restricted affect (C4, C5, C6); and apprehension about the future (C7). The results of this study support other research that suggests that a more general measure of experiential avoidance such as the AAQ is not a very useful predictor of the variance of PTSD avoidance symptom severity. Instead, more specific measures such as the TAS-20 Factor 1 (ability to identify feelings) and the WBSI (thought suppression) are better predictors, even when combined with other measures of experiential avoidance, these the TAS-20 Factor 1 and WBSI remained unique predictors.

Part of the reason for the robustness of these two measures may be the relative simplicity and conceptual purity of their items. For example, although other measures in this study contained items related to confusion about somatic and affective experience (e.g., FFMQ, AAQ, CISS, TMMS), they may require more reflection or insight to answer, and they include items about other experiences. By contrast, the TAS-20 Factor 1 items seem simpler and more basic, and appearing to require less insight than related items on the other measures in capturing the raw puzzlement and confusion surrounding one's experience. Factor 1 may capture this confusion about somatic and affective experiences in a way that is particularly germane to the experience of individuals experiencing posttraumatic symptoms, or who may not be capable of the degree of understanding that is required by the other measures. In support of this, the TMMS provides a point of comparison. The items that make up TMMS clarity subscale are similar conceptually to the TAS-20 Factor 1, but the TMMS appears to require examinees to be able to reflect on their feelings to a greater degree than the TAS-20 (e.g., TMMS: "My belief and opinions always seem to change depending on how I feel"). Similarly to the TAS-20, the WBSI is also a very conceptually pure measure. Although other measures in this study contained items that pertain to thoughts (e.g., FFMQ, AAQ, CISS, TMMS), only the WBSI consisted of items almost exclusively related to thinking.

By contrast, the other measures of experiential avoidance were made of items reflecting a more varied understanding of the construct they were measuring. As noted, the AAQ covers different aspects of experiential avoidance, such as emotional experiences and the ability to take action. In the CISS, the emotional coping subscale includes thinking, emotions, and actions. The TMMS attention subscale contains items pertaining to thoughts, emotions, and actions, the clarity subscale to emotions and reflections on feelings, and the repair subscale on thoughts and

emotions. For individuals with posttraumatic avoidance symptoms, which may reflect avoidance behaviors, perhaps simple, unambiguous items that do not require much reflection may be most appropriate. It should be noted here that we are stressing conceptual simplicity and not statistical. The TAS-20 and WBSI did not have higher internal consistency coefficients than the other measures.

*Mindfulness*

Although mindfulness was not nearly as robust a predictor of PTSD avoidance symptom severity as alexithymia and thought suppression, it predicted more of the individual variance in PTSD avoidance symptomatology than coping skills, emotional intelligence, and—in the traumatized sample—a general measure of experiential avoidance (AAQ). It is also worth noting that the combination of the TAS-20 and FFMQ predicted about as much of the variance in PTSD avoidance symptom severity in the traumatized sample as all of the experiential avoidance measures combined. These results suggest that mindfulness may be a useful supplement to experiential avoidance, especially alexithymia in understanding PTSD avoidance symptomatology.

In comparing the results from the PTSD and traumatized samples, it is worth noting that the pattern of significance of FFMQ subscales was somewhat different between the two samples. Within the PTSD group, only the tendency to act mindfully during everyday life emerged as having a significant relationship with PTSD avoidance symptom severity.[1] Scores on the FFMQ subscale also exhibited a medium effect size in distinguishing between the PTSD and non-PTSD groups. There are a few possible explanations for why the tendency to act mindfully in everyday life exhibited the strongest relationship with PTSD avoidance symptom severity in the PTSD

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[1] This contrasts with unpublished data collected by the authors that found that the ability to observe one's experience was the only FFMQ subscale that significantly correlated with PDS PTSD avoidance symptom severity.

sample. First, the development of PTSD may impair an individual's ability to act mindfully; that is, the heightened severity of full-blown PTSD symptoms compared to sub-clinical posttraumatic symptoms may impair one's ability to act mindfully. It is also possible that individuals who are less mindful in everyday life may simply be more vulnerable to developing PTSD following a traumatic experience. As the data are correlational, the direction of the relationship cannot be determined. The second possibility is statistical: the smaller PTSD sample ($n = 44$) may be subject to greater individual differences in the pattern of relationships than the larger traumatized sample ($n = 191$). This would also explain the difference in patterns between the PTSD sample ($n = 44$) and the unpublished PTSD data ($n = 22$) indicated in the footnote.

In the traumatized sample, although the tendency to engage one's everyday experience mindfully was also a significant predictor of PTSD avoidance symptom severity, the tendency to be nonjudgmental of one's experiences appeared to be a more important predictor. Scores on nonjudgment also exhibited the largest effect size among the 5 facets of mindfulness in distinguishing PTSD from non-PTSD groups. Given that a tendency towards self-criticism or negative self-appraisal is predictive of individuals who develop PTSD following a traumatic event (Bryant & Guthrie, 2007; Cox, MacPherson, Enns, & McWilliams, 2004; Sharhabani-Arzy, Amir, & Swisa, 2005), and that trauma symptom severity has been positively associated with lower acceptance of emotional experiences (Tull, Barrett, McMillan, & Roemer, 2007), the predictive power of nonjudgment is not surprising. An attitude of openness and nonjudgment towards one's experiences may be a crucial mechanism of change in promoting the positive benefits associated with mindfulness (Shapiro, Carlson, Astin, & Freedman, 2006); consequently, an open and nonjudgmental attitude towards one's experience may be important in

the treatment of trauma and PTSD, and/or it may have a prophylactic effect in protecting against the development of PTSD in traumatized individuals.

One helpful aspect of exploring the relationship between mindfulness and posttraumatic symptoms is that mindfulness, because is also a practice, can indicate elements of mental training that may help to either prevent the development of PTSD following trauma exposure, or to aid in the recovery of PTSD symptoms. Although there is much more research to be done in exploring how mindfulness may be beneficial in the treatment of posttraumatic symptoms, some recent research offers some indication as to potential mechanisms of mindfulness. For example, research suggests that individuals higher in mindfulness possess a greater ability to let go of negative thoughts (Frewen et al., in press), such that there would be less of a need for avoidance or emotional numbing. Even 15 minutes of focused breathing compared to 15 minutes of unfocused attention has been associated with a greater willingness to engage negative stimuli (Arch and Craske, 2006). This may be related to a greater ability to label affective states, which may allow for some degree of detachment from these states, thus reducing the negative affect associated with unpleasant affective experiences (Creswell, Way, Eisenberger, & Lieberman, 2007).

Consequently, mindfulness may help traumatized clients remain in contact with distressing experiences, decreasing avoidance of these experiences, and allowing them to learn to relate to these experiences in a more productive way (Batten, Orsillo, & Walser, 2006; Follette, Palm, & Pearson, 2006). Individuals can to begin to dis-identify with their experiences and to begin to relate to these experiences more objectively (Shapiro, Carlson, Astin, & Freedman, 2006). Brain activation associated with a taking a more present-centered perspective on one's immediate experience suggests a more objective, detached perspective of somatosensory

experiences, as opposed to a more emotion-laden, self-referential focus (Farb at al., 2007), which may help change the way individuals relate to the self, allowing them to more effectively engage and disengage from different streams of information (Siegel, 2007). Regular meditation practice may also increase the body's regulation of the limbic response of the prefrontal cortex when confronted with everyday experiences and stimuli (Creswell, Way, Eisenberger, & Lieberman, 2007). As individuals begin to find unpleasant stimuli less personally threatening, thought suppression and emotional avoidance would be decreased, and psychological flexibility would be increased (Follette, Palm, & Pearson, 2006).

*Self-Compassion*

With the strong relationship between posttraumatic avoidance symptoms and low nonjudgment in the traumatized sample, the results of this study may tie into the growing *self-compassion* literature. Developed by Neff (2003a, 2003b) as it is used in this context, self-compassion is based on Buddhist notions of compassion; specifically, it relates to *karuna*, a general sense of compassion towards all beings, and *metta* or loving-kindness, a practice that involves consciously generating good will towards all sentient beings (K. Neff, personal communication, 2005). The main components of self-compassion are 1.) kindness to the self vs. harsh judgment; 2.) observing one's common humanity vs. feeling isolated; 3.) mindful awareness of one's painful experiences vs. over-identifying with them. Increases in self-compassion have been associated with decreases in self-criticism, rumination, and thought suppression in a sample of college students (Neff, Kirkpatrick, & Rude, 2007)—symptoms also associated with PTSD. A recent study by this author found that individuals with PTSD exhibited lower self-compassion, and avoidance symptom severity was associated with less kindness towards one's self, a concept that may be conceptually related to nonjudgment (Thompson &

Waltz, 2008). Subsequent research may address the relationship between self-compassion and the ability to be mindfully open to and nonjudgmental of one's experience in trauma survivors.

*Treatment Implications*

In a study of the neural correlates between PTSD and alexithymia symptoms, the authors note that their results are consistent with the notion that the "more an individual is capable of verbal awareness, interoceptive monitoring, and higher order insight regarding his or her bodily-emotional symptoms, the less likely it is that he or she will be overwhelmed by them" (Frewen et al., 2008, p. 177). Consequently, learning to observe and interpret thoughts, emotions, and bodily sensations may be extremely important in treating PTSD. The results of this study suggest that the tendency to act with awareness in everyday life and the tendency to engage experiences nonjudgmentally are two aspects of mindfulness that may be particularly emphasized in trauma populations.

Also, as has been noted, mindfulness is a form of exposure therapy (Baer, 2003; Linehan, 1993; Shapiro, Carlson, Astin, & Freedman, 2006). As prolonged exposure is considered to be one of the most effective treatments for PTSD (see Nemeroff, 2006), the practice of mindfulness may serve a similar function as exposure therapy, reducing avoidance of distressing experiences and allowing new learning to occur. In learning to remain in contact with distressing affective states without resorting to avoidance behaviors, mindfulness practice may also help prepare individuals with PTSD for more formal exposure treatment, which may improve outcomes for exposure (Follette, Palm, & Pearson, 2006). As mindfulness-based treatments already employ strategies for cultivating greater awareness and a nonjudgmental attitude, it may be useful to adapt existing treatments or combine techniques with other treatments in treating trauma populations.

A number of VA hospitals have developed programs incorporating mindfulness-based techniques in treating veterans with PTSD. Some programs are based on specific empirically-supported mindfulness-based treatments (. For example, was ACT has been adapted for a dual-diagnosis treatment program for individuals with PTSD and substance abuse disorders (Batten, DeViva, et al., in press). Several other hybrids of one or more mindfulness-based treatments are also being used, including those drawing from DBT, MBSR, and ACT. Preliminary findings suggest that mindfulness and sitting meditation are appropriate treatments for individuals with PTSD (Chartier, Walser, Hugo, Woodward, & Drescher, 2007). As clinicians and researchers continue to explore the effectiveness of incorporating mindfulness techniques into trauma treatment, it will be important to continue studying the active ingredients of mindfulness and the most effective ways of integrating them into treatment.

*Limitations*

There are several limitations of this study. Perhaps the largest, as already mentioned, is its cross-sectional nature. It is impossible to discern if the development of PTSD symptoms leads to lower mindfulness and greater experiential avoidance, or if pre-existing factors dispose traumatized individuals towards developing PTSD. This is especially important in light of our finding that participants with no reported trauma history score more similarly on measures of mindfulness and experiential avoidance to those with a trauma history who do not meet PTSD criteria, than to those participants who meet PTSD criteria. Prospective studies may help address the questions of causality.

A second limitation is the use of a paper-and-pencil self-report measure of PTSD. Although the PDS has exhibited excellent psychometrics and appears to map onto *DSM* PTSD criteria very clearly, it is not a substitute for a clinical interview. The researcher would like to

note, however, that he believes the PDS is a somewhat conservative measure of PTSD. In hand-scoring the measure, several participants barely missed meeting PDS PTSD criteria, even those endorsing fairly high PTSD symptoms across all three symptom clusters. Consequently, it is possible that the PDS *underestimated* the incidence of PTSD in this sample.

As with any convenience sample, college students, the majority of whom are between 18-19 years of age are not be a truly representative sample. For example, these results may not be applicable to the veteran population served in VA hospitals. Nor may these results be representative of a less-educated or older adults.

Finally, statistical power was an issue, particularly in the PTSD sample. Ideally, the researcher would have preferred to run one hierarchical multiple regression model with all the appropriate experiential avoidance and mindfulness measures entered in separate steps. With 44 participants, that was not feasible. Low power likely increased Type 1 Error, and running several regression models likely increased Type 2 Error. Consequently, research with larger PTSD samples is needed to test more complicated models of the role of mindfulness in predicting PTSD avoidance symptom severity.

In summary, the results of this study suggest that, although mindfulness may not be the most potent predictor of variance in PTSD avoidance symptom severity when compared to alexithymia and thought suppression, facets of mindfulness such as the tendency to engage in one's everyday experiences with awareness and nonjudgment of experience are worth continued exploration in trauma populations. Because mindfulness is a measurable skill that can be cultivated and is not simply a reflection of pathology, measures of mindfulness may offer additional insight into the treatment of individuals with posttraumatic symptoms. This study is

only a tentative step, and much more research must be done in order to tease out the mechanisms

of mindfulness that are most germane to trauma and PTSD treatment.

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Appendix A

## 5-FACTOR  M QUESTIONNAIRE

**Please rate each of the following statements using the scale provided.  Write the number in the blank that best describes <u>your own opinion</u> of what is <u>generally true for you.</u>**

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| **never or very rarely true** | **rarely true** | **sometimes true** | **often true** | **very often or always true** |

\_\_\_\_\_ 1.  When I'm walking, I deliberately notice the sensations of my body moving.

\_\_\_\_\_ 2.  I'm good at finding words to describe my feelings.

\_\_\_\_\_ 3.  I criticize myself for having irrational or inappropriate emotions.

\_\_\_\_\_ 4.  I perceive my feelings and emotions without having to react to them.

\_\_\_\_\_ 5.  When I do things, my mind wanders off and I'm easily distracted.

\_\_\_\_\_ 6.  When I take a shower or bath, I stay alert to the sensations of water on my body.

\_\_\_\_\_ 7.  I can easily put my beliefs, opinions, and expectations into words.

\_\_\_\_\_ 8.  I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted.

\_\_\_\_\_ 9.  I watch my feelings without getting lost in them.

\_\_\_\_\_ 10. I tell myself I shouldn't be feeling the way I'm feeling.

\_\_\_\_\_ 11. I notice how foods and drinks affect my thoughts, bodily sensations, and emotions.

\_\_\_\_\_ 12. It's hard for me to find the words to describe what I'm thinking.

\_\_\_\_\_ 13. I am easily distracted.

\_\_\_\_\_ 14. I believe some of my thoughts are abnormal or bad and I shouldn't think that way.

\_\_\_\_\_ 15. I pay attention to sensations, such as the wind in my hair or sun on my face.

\_\_\_\_\_ 16. I have trouble thinking of the right words to express how I feel about things

\_\_\_\_\_ 17. I make judgments about whether my thoughts are good or bad.

\_\_\_\_\_ 18. I find it difficult to stay focused on what's happening in the present.

\_\_\_\_\_ 19. When I have distressing thoughts or images, I "step back" and am aware of the thought or image without getting taken over by it.

\_\_\_\_\_ 20. I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.

\_\_\_\_\_ 21. In difficult situations, I can pause without immediately reacting.

\_\_\_\_\_ 22. When I have a sensation in my body, it's difficult for me to describe it because I can't find the right words.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| **never or very rarely true** | **rarely true** | **sometimes true** | **often true** | **very often or always true** |

_____ 23. It seems I am "running on automatic" without much awareness of what I'm doing.

_____ 24. When I have distressing thoughts or images, I feel calm soon after.

_____ 25. I tell myself that I shouldn't be thinking the way I'm thinking.

_____ 26. I notice the smells and aromas of things.

_____ 27. Even when I'm feeling terribly upset, I can find a way to put it into words.

_____ 28. I rush through activities without being really attentive to them.

_____ 29. When I have distressing thoughts or images I am able just to notice them without reacting.

_____ 30. I think some of my emotions are bad or inappropriate and I shouldn't feel them.

_____ 31. I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow.

_____ 32. My natural tendency is to put my experiences into words.

_____ 33. When I have distressing thoughts or images, I just notice them and let them go.

_____ 34. I do jobs or tasks automatically without being aware of what I'm doing.

_____ 35. When I have distressing thoughts or images, I judge myself as good or bad, depending what the thought/image is about.

_____ 36. I pay attention to how my emotions affect my thoughts and behavior.

_____ 37. I can usually describe how I feel at the moment in considerable detail.

_____ 38. I find myself doing things without paying attention.

_____ 39. I disapprove of myself when I have irrational ideas.

Appendix B

**The Acceptance and Action Questionnaire – 9**

Below you will find a list of statements.  Please rate the truth of each statement as it applies to you.  Use the following scale to make your choice.


1---------------2----------------3----------------4---------------5---------------6---------------7
never      very seldom      seldom        sometimes      frequently    almost always   always
true          true               true                true               true               true               true


_____  1.      I am able to take action on a problem even if I am uncertain what is the right thing to do. [Use in AAQ-9, reverse score.]

_____  2.      When I feel depressed or anxious, I am unable to take care of my responsibilities. [Use in AAQ-9.]

_____  3.      I rarely worry about getting my anxieties, worries, and feelings under control. [Use in AAQ-9, reverse score.]

_____  4.      I'm not afraid of my feelings. [Use in AAQ-9, reverse score.]

_____  5.      Anxiety is bad. [Use in AAQ-9]

_____  6.      If I could magically remove all the painful experiences I've had in my life, I would do so. [Use in AAQ-9.]

_____  7.      I often catch myself daydreaming about things I've done and what I would do differently next time. [Use in AAQ-9]

_____  8.      When I evaluate something negatively, I usually recognize that this is just a reaction, not an objective fact. [Use in AAQ-9 – reverse score]

_____  9.      When I compare myself to other people, it seems that most of them are handling their lives better than I do. [Use in AAQ-9]

Reverse score items: 1, 3, 4, 8.

Appendix C

# WBSI

This survey is about thoughts. There are no right or wrong answers, so please respond honestly to each of the items below. Be sure to answer every item by circling the appropriate letter beside each.

| A | B | C | D | E |
|---|---|---|---|---|
| Strongly Disagree | Disagree | Neutral or Don't Know | Agree | Strongly Agree |

A B C D E    1. There are things I prefer not to think about.

A B C D E    2. Sometimes I wonder why I have the thoughts I do.

A B C D E    3. I have thoughts that I cannot stop.

A B C D E    4. There are images that come to mind that I cannot erase.

A B C D E    5. My thoughts frequently return to one idea.

A B C D E    6. I wish I could stop thinking of certain things.

A B C D E    7. Sometimes my mind races so fast I wish I could stop it.

A B C D E    8. I always try to put problems out of mind.

A B C D E    9. There are thoughts that keep jumping into my head.

A B C D E    10. There are things that I try not to think about.

A B C D E    11. Sometimes I really wish I could stop thinking.

A B C D E    12. I often do things to distract myself from my thoughts.

A B C D E    13. I have thoughts that I try to avoid.

A B C D E    14. There are many thoughts that I have that I don't tell anyone.

A B C D E    15. Sometimes I stay busy just to keep thoughts from intruding on my mind.

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SCORING:  Total the items with A=1, B=2, C=3, D=4, E=5.

See Wegner and Zanakos (1994) for norms and interpretation.

Appendix D

# **CISS**

***Instructions***: The following are ways people react to various difficult, stressful, or upsetting situations. Please circle a number from 1 to 5 for each item. Indicate how much you engage in these types of activities when you encounter a difficult, stressful, or upsetting situation.

|  |  | Not at all | | | | Very much |
|---|---|---|---|---|---|---|
| 1. | Schedule my time better | 1 | 2 | 3 | 4 | 5 |
| 2. | Focus on the problem and see how I can solve it | 1 | 2 | 3 | 4 | 5 |
| 3. | Think about the good times I've had | 1 | 2 | 3 | 4 | 5 |
| 4. | Try to be with other people | 1 | 2 | 3 | 4 | 5 |
| 5. | Blame myself for procrastinating | 1 | 2 | 3 | 4 | 5 |
| 6. | Do what I think best | 1 | 2 | 3 | 4 | 5 |
| 7. | Preoccupied with aches and pains | 1 | 2 | 3 | 4 | 5 |
| 8. | Blame myself for having gotten into this situation | 1 | 2 | 3 | 4 | 5 |
| 9. | Window shop | 1 | 2 | 3 | 4 | 5 |
| 10. | Outline my priorities | 1 | 2 | 3 | 4 | 5 |
| 11. | Try to go to sleep | 1 | 2 | 3 | 4 | 5 |
| 12. | Treat myself to a favorite food or snack | 1 | 2 | 3 | 4 | 5 |
| 13. | Feel anxious about not being able to cope | 1 | 2 | 3 | 4 | 5 |
| 14. | Become very tense | 1 | 2 | 3 | 4 | 5 |
| 15. | Think about how I have solved similar problems | 1 | 2 | 3 | 4 | 5 |
| 16. | Tell myself that it is really not happening to me | 1 | 2 | 3 | 4 | 5 |
| 17. | Blame myself for being too emotional about the situation | 1 | 2 | 3 | 4 | 5 |
| 18. | Go out for a snack or meal | 1 | 2 | 3 | 4 | 5 |
| 19. | Become very upset | 1 | 2 | 3 | 4 | 5 |
| 20. | Buy myself something | 1 | 2 | 3 | 4 | 5 |
| 21. | Determine a course of action and follow it | 1 | 2 | 3 | 4 | 5 |
| 22. | Blame myself for not knowing what to do | 1 | 2 | 3 | 4 | 5 |
| 23. | Go to a party | 1 | 2 | 3 | 4 | 5 |
| 24. | Work to understand the situation | 1 | 2 | 3 | 4 | 5 |
| 25. | "Freeze" and don't know what to do | 1 | 2 | 3 | 4 | 5 |
| 26. | Take corrective action immediately | 1 | 2 | 3 | 4 | 5 |
| 27. | Think about the event and learn from my mistakes | 1 | 2 | 3 | 4 | 5 |
| 28. | Wish that I could change what had happened or how I felt | 1 | 2 | 3 | 4 | 5 |
| 29. | Visit a friend | 1 | 2 | 3 | 4 | 5 |
| 30. | Worry about what I am going to do | 1 | 2 | 3 | 4 | 5 |
| 31. | Spend time with a special person | 1 | 2 | 3 | 4 | 5 |
| 32. | Go for a walk | 1 | 2 | 3 | 4 | 5 |
| 33. | Tell myself that it will never happen again | 1 | 2 | 3 | 4 | 5 |
| 34. | Focus on my general inadequacies | 1 | 2 | 3 | 4 | 5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 35. | Talk to someone whose advice I value | 1 | 2 | 3 | 4 | 5 |
| 36. | Analyze the problem before reacting | 1 | 2 | 3 | 4 | 5 |
| 37. | Phone a friend | 1 | 2 | 3 | 4 | 5 |
| 38. | Get angry | 1 | 2 | 3 | 4 | 5 |
| 39. | Adjust my priorities | 1 | 2 | 3 | 4 | 5 |
| 40. | See a movie | 1 | 2 | 3 | 4 | 5 |
| 41. | Get control of the situation | 1 | 2 | 3 | 4 | 5 |
| 42. | Make an extra effort to get things done | 1 | 2 | 3 | 4 | 5 |
| 43. | Come up with several different solutions to the problem | 1 | 2 | 3 | 4 | 5 |
| 44. | Take time off and get away from the situation | 1 | 2 | 3 | 4 | 5 |
| 45. | Take it out on other people | 1 | 2 | 3 | 4 | 5 |
| 46. | Use the situation to prove that I can do it | 1 | 2 | 3 | 4 | 5 |
| 47. | Try to be organized so I can be on top of the situation | 1 | 2 | 3 | 4 | 5 |
| 48. | Watch TV | 1 | 2 | 3 | 4 | 5 |

Appendix E

TMMS

Please read each statement and decide whether or not you agree with it.  To indicate your level of agreement, choose a number for each question based on the following scale.  Mark your answer on the answer sheet.  Do not write on this page.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| **strongly disagree** | **somewhat disagree** | **neither agree nor disagree** | **somewhat agree** | **strongly agree** |

1. I try to think good thoughts no matter how badly I feel.

2. People would be better off if they felt less and thought more.

3. I don't think it's worth paying attention to your emotions or moods.

4. I don't usually care much about what I'm feeling.

5. Sometimes I can't tell what my feelings are.

6. I am rarely confused about how I feel.

7. Feelings give direction to life.

8. Although I am sometimes sad, I have a mostly optimistic outlook.

9. When I am upset I realize that the "good things in life" are illusions.

10. I believe in acting from the heart.

11. I can never tell how I feel.

12. The best way for me to handle my feelings is to experience them to the fullest.

13. When I become upset I remind myself of all the pleasures in life.

14. My belief and opinions always seem to change depending on how I feel.

15. I am often aware of my feelings on a matter.

16. I am usually confused about how I feel.

17. One should never be guided by emotions.

18. I never give in to my emotions.

19. Although I am sometimes happy, I have a mostly pessimistic outlook.

20. I feel at ease about my emotions.

21. I pay a lot of attention to how I feel.

22. I can't make sense out of my feelings.

23. I don't pay much attention to my feelings.

24. I often think about my feelings.

25. I am usually very clear about my feelings.

26. No matter how badly I feel, I try to think about pleasant things.

27. Feelings are a weakness humans have.

28. I usually know my feelings about a matter.

29. It is usually a waste of time to think about your emotions.

30. I almost always know exactly how I am feeling.

Appendix F

#_____

1. What is your gender? _____

2. What is your age? _____

3. Relationship status? _____

4. Military service? _____ Active duty? _____
If active, when and where were you deployed? _____

5. Have you ever received counseling? (Please describe): _____
_____

6. Do you engage in any of the practices below? Choose as many as are applicable.

__ sitting meditation. If yes, please describe. For how long have you practiced and how many
hours per week do you practice? _____
_____

__ yoga. If yes, for how long have you practiced and how many hours per week do you practice?
_____

__ tai chi. If yes, for how long have you practiced and how many hours per week do you
practice? _____

__ qi-gong. If yes, for how long have you practiced and how many hours per week do you
practice? _____

__ martial arts. If yes, please specify what; for how long have you practice, and how many hours
per week do you practice? **_____**

7. How are you feeling currently? (Circle one)

|  1  |  2  |  3  |  4  |  5  |
| --- | --- | --- | --- | --- |
| not distressed | a little distressed | distressed | very distressed | extremely distressed |

8. Do you have any concerns related to your participation that you would like to discuss with the
experimenter?

    Yes_____
    No _____