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Sarah Reiland

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PREDICTORS OF PTSD SYMPTOMS FOR CRITERION A AND NON-CRITERION A

EVENTS

Sarah Reiland

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Dissertation Committee:

Dean Lauterbach, Ph.D., Chair

Ellen Koch, Ph.D.

Norman Gordon, Ph.D.

Lisa Lauterbach, Ph.D.

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Abstract

This study evaluated the current DSM-IV conceptualization of posttraumatic stress disorder (PTSD). It examined predictors (i.e., event, person, and cognitive characteristics) and the factor structure of PTSD symptoms for events that do and do not meet criterion A. Event, person, and cognitive variables included in this study explained 47% of the variance in PTSD symptoms for the criterion A group and 56% of the variance in PTSD symptoms for the non-criterion A group. In both groups, cognitive variables explained the majority of variance in PTSD symptom severity. Although predictors of PTSD symptoms varied for criterion A and non-qualifying events, the factor structure was similar, suggesting that trauma responses to nonqualifying events may look very similar to trauma responses to criterion A events. This study suggests that a reevaluation of the diagnostic criteria for PTSD is warranted.

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Table of Abbreviations

Abbreviation	Definition
PTSD	Posttraumatic Stress Disorder
DSM	Diagnostic and Statistical Manual for Mental Disorders
PSWQ	Penn State Worry Questionnaire
WBSI	White Bear Suppression Inventory
AAQ	Acceptance and Action Questionnaire
PTGI	Posttraumatic Growth Inventory
PTCI	Posttraumatic Cognitions Inventory
DRI	Dispositional Resilience Index
SES	Self-efficacy Scale
CSE	Coping Self-Efficacy scale
ACQ	Anxiety Control Questionnaire
PCL-C	Posttraumatic Stress Disorder Checklist-Civilian Version

Introduction

Individual differences in responses to stress (e.g., divorce, loss of employment) have led to the identification of risk and resiliency factors that predict reactions to trauma (e.g., serious accident, disaster, violent crime). Important to this field of traumatic stress research is an examination of what constitutes a traumatic event and what is the most parsimonious and accurate description of the symptoms that emerge following exposure to a potentially traumatic event. In other words, what is the best characterization of posttraumatic stress disorder (PTSD)? In addition, it is important to better understand the relative contribution of event (e.g., type, duration) and personal characteristics (e.g., demographic and cognitive variables) in the development of adverse reactions to events. The diagnosis of posttraumatic stress disorder (PTSD) requires exposure to an event that meets two conditions. As specified in the Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition – Text Revision (DSM-IV-TR; APA, 2000), a person must have been exposed to an event that involved actual or threatened death, serious injury, or threat to the physical integrity of self or others (criterion A1); further, the person's response must have involved intense fear, helplessness, or horror (criterion A2). Given the presence of an event that meets both conditions of criterion A, PTSD is diagnosed when a person reports at least one reexperiencing symptom, three avoidance or numbing symptoms, and two arousal symptoms for a duration of at least a month with clinically significant levels of distress or impairment in functioning. The definition of trauma has received considerable attention in recent years, as it has been found that events differ in their capacity to elicit PTSD (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995), people sometimes develop PTSD-like responses to events that do not meet criterion A (Bodkin, Pope, Detke, & Hudson, 2007), and many people never develop PTSD after experiencing events that meet criterion A (Kessler et al.).

The imperfect relationship between trauma exposure and PTSD has sparked a great deal of research on the nature of trauma and PTSD as well as risk and resiliency factors that moderate and mediate this relationship. In the sections that follow, this paper will explore measurement issues related to criterion A, the factor structure of PTSD, rates of PTSD development for different categories of events, and variables that mediate and moderate the relationship between trauma exposure and PTSD. After a review of the literature, this paper will describe a study that explored event and personal characteristics as they relate to risk and resiliency factors in PTSD. Specifically, cognitive models of PTSD were used to generate a set of factors that were hypothesized to predict PTSD symptoms in response to events that meet criterion A and events that do not meet criterion A. Cognitive models of PTSD may partially explain why it is that some persons develop PTSD symptoms after less severe events and, conversely, why some persons do not develop PTSD after more severe events.

Criterion A Measurement Issues

The diagnostic requirements for assessing trauma exposure have become more specific over time (Weathers & Keane, 2007). When PTSD was first introduced into the diagnostic nomenclature in the DSM-III (APA, 1980), criterion A specified that PTSD could be diagnosed after exposure to a recognizable stressor outside of the range of usual human experience that would evoke distress in almost everyone. Criterion A in the DSM-III was criticized for not providing examples of events that were extreme enough to qualify and for neglecting subjective aspects of traumatization (Breslau & Davis, 1987). In addition, there are a variety of events that are clearly not outside the range of human experience but which can and do frequently result in symptoms of PTSD. A list of examples of qualifying events was added to the DSM-III-R (APA, 1987) to clarify the intent of criterion A, but the criterion was still criticized for confusing

"traumatic" with "statistically rare," providing little guidance for identifying events that qualify, and invoking a normative standard that confounds objective and subjective aspects of traumatization (Weathers & Keane). The DSM-IV (APA, 1994) changed the structure of criterion A in response to criticisms to form a two-part definition that specifies event characteristics (i.e., type of exposure and nature of event; criterion A1) and a person's initial response to the event (i.e., presence of fear, helplessness or horror; criterion A2). Trauma is identified when a person "experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others" (APA, 2000, p. 467).

Even as the diagnostic guidelines for assessing criterion A1 have become more specific over time, its measurement in the PTSD literature is still fraught with difficulties (Netland, 2001). Events vary according to magnitude of threat of harm, complexity, frequency, duration, predictability, and controllability (Weathers & Keane, 2007). Current trauma exposure measures do not address every dimension of trauma exposure (Weathers & Keane), so researchers must decide which dimensions of exposure to evaluate (e.g., life threat, frequency) based on the purposes of the particular study.

Criterion A1 has been criticized for being "overinclusive" in its characterization of exposure by allowing awareness of an event happening to another person to meet criterion A (Rosen, 2004). Breslau and Kessler (2001) compared the diagnostic guidelines in the DSM-III-R to the DSM-IV and suggested that 14 event categories met criterion A1 in the DSM-III-R, and 19 event categories met criterion A1 in the DSM-IV. They found that the five additional events that met criterion A1 in the DSM-IV (e.g., learning about the sudden unexpected death of a loved one, or learning that a close relative was sexually assaulted, attacked, in a car accident, or in

another type of accident) led to a 59.2% increase in the number of events reported in their sample.

Reliability is another concern in the assessment of criterion A1. Several studies have found increased reports of trauma exposure upon repeated administrations of trauma measures (e.g., Roemer, Litz, Orsillo, Ehlich, & Friedman, 1998a; Southwick, Morgan, Nicolaou, & Charney, 1997), whereas others have found reports to be relatively stable over time (e.g., Ouimette, Read, & Brown, 2005). Changes in reporting seem to be particularly salient when persons are exposed to situations in which they may have encountered numerous discrete events over a period of time (e.g., combat experiences, sexual and physical abuse, and exposure to instances of domestic or political violence; Netland, 2001). This phenomenon leads some researchers (e.g., Netland) to suggest classifying traumatic events as discrete (e.g., rape) or chronic (e.g., combat exposure, abuse), recognizing that memory for specific instances within chronic events may be variable.

The addition of criterion A2 in the assessment of PTSD addresses some problems associated with relying exclusively on criterion A1 but creates new measurement challenges that have not been addressed in many PTSD studies. Breslau and Kessler (2001) noted that the increase in reported exposure to qualifying events caused by the expanded definition of trauma (i.e., criterion A1) was attenuated by the addition of criterion A2, leading to a 22% increase in exposure to qualifying events (versus the 59.2% increase when criterion A1 was used alone) using the DSM-IV guidelines rather than the DSM-III-R guidelines. Further, 76.5% of A1 events in their study resulted in fulfillment of criterion A2 as well, suggesting that initial responses of fear, helplessness, and horror are common reactions to potentially harmful or life-threatening events. Although criterion A2 had low positive predictive power in relation to PTSD in one study

(.34), it had very high negative predictive power (.95), meaning that the absence of A2 was a strong indicator of PTSD's absence (Schnurr, Spiro, Vielhauer, Findler, & Hamblen, 2002).

Many PTSD studies assess for the presence of only criterion A1 and do not assess for criterion A2 (Rasmussen, Rosenfeld, Reeves, & Keller, 2007), but those that do tend to show that an initial response of fear, helplessness, or horror predicts PTSD presence (e.g., Brewin, Andrews, & Rose, 2000; Rasmussen et al.). Roemer, Orsillo, Borkovec, and Litz (1998b) found that retrospective reports of helplessness (but not fear or horror) during the event correlated with PTSD symptom severity. Several research groups argue that the list of emotions in criterion A2 is too narrow and should include other distressing emotions as well as diminished emotional responses (Weathers & Keane, 2007). Brewin et al. (2000) found that heightened levels of anger with others and shame predicted PTSD in the absence of reported initial fear, helplessness, or horror. Roemer et al. also found that initial numbing or dissociative responses after an event that satisfied criterion A1 were predictive of PTSD symptoms. A major limitation of all of these studies is a retrospective assessment of criterion A2. The finding that criterion A2 is a poor positive predictor of PTSD (Schnurr et al., 2002), however, suggests that there may not be a strong tendency for current PTSD symptoms to bias a person's recollection of their initial response to the event (King, King, Erickson, Huang, Sharkansky, & Wolfe, 2006), as the majority of persons who endorse criterion A2 do not qualify for a diagnosis of PTSD. In summary, research needs to examine features of events (e.g., chronic versus acute) that may predict PTSD emergence/severity, include assessment of criterion A2 in determining whether experiences qualify for a diagnosis of PTSD, and evaluate other emotional responses that could be added to criterion A2. The study that follows examined each of these issues.

PTSD Factor Structure

The DSM-IV anxiety disorder work group conceptualized PTSD as a set of symptoms from three categories: reexperiencing, avoidance/numbing, and hyperarousal. Foa, Riggs, and Gershuny (1995) did find three factors corresponding to DSM criteria in a sample of 158 female assault survivors, but this study has been criticized for its small sample size (Taylor, Kuch, Koch, Crockett, & Passey, 1998). The majority of studies, however, fail to replicate the three-factor model proposed in the DSM even though they all use measures based directly on the 17-symptom DSM conceptualization of PTSD (e.g., Asmundson et al., 2000, King & King, 1994, Taylor et al., 1998).

Some studies support a two-factor structure of PTSD. A solution with intrusion and avoidance symptoms loading on the first factor and numbing and arousal symptoms loading on the second factor has been found in samples of 103 motor vehicle accident survivors and 419 United Nations peacekeepers exposed to political violence (Taylor et al., 1998) and 217 motor vehicle accident victims (Buckley, Clanchard, & Hickling, 1998). A variant of the two-factor model with depression and avoidance symptoms loading onto the first factor and anxiety and arousal symptoms loading onto the second factor was found in a sample of 185 victims of either a fire or a motor vehicle accident (Maes et al., 1998).

The majority of studies, however, support a 4-factor model of PTSD. Two variants of a 4-factor model have been supported in the literature. The first includes four intercorrelated factors (with or without a single higher-order factor) of reexperiencing, effortful avoidance, emotional numbing, and arousal symptoms. The four-factor intercorrelated model without a higher-order factor has been found in many large samples (ns = 148 to 1218), including persons with PTSD from a nationally representative population survey (McWilliams, Cox, & Asmundson, 2005),

male veterans (King, Leskin, King, & Weathers, 1998), male United Nations peacekeepers (Asmundson, Wright, McCreary, & Pedlar, 2003), injured survivors of community violence (Marshall, 2004), women who reported sexual harassment (Palmieri & Fitzgerald, 2005), cancer survivors (DuHamel et al., 2004), and women with Stage II or III breast cancer (Shelby et al., 2005). A four-factor intercorrelated model with a higher-order factor was also found in several samples, including accident survivors in a primary care setting (Asmundson et al., 2000), several samples of veterans (King & King, 1994), and hurricane survivors (Norris, Perilla, & Murphy, 2001).

The second four-factor model of PTSD supported in the literature departs even more from the DSM symptom structure than the previously mentioned four-factor model, with a dysphoria component in addition to factors representing reexperiencing, avoidance, and arousal symptoms. In this model, the hypervigilance and exaggerated startle response symptoms comprise the hyperarousal factor, and the remaining hyperarousal symptoms along with the emotional numbing symptoms form the dysphoria factor. Support for this model has been reported in 3695 Gulf War veterans and non-deployed controls (Simms, Watson, & Boebbeling, 2002), 528 Western New York University undergraduates following the September 11th World Trade Center attacks (Baschnagel, O'Connor, Colder, & Hawk, 2005), 1116 motor vehicle accident survivors (Elklit & Shevlin, 2007), and 429 undergraduates exposed to a variety of traumatic events (Hoyt & Yeater, 2007). McWilliams et al. (2005) conducted a follow-up principal components analysis following the failure of their best model of four intercorrelated factors (reexperiencing, avoidance, numbing, and hyperarousal) to meet all of the goodness-of-fit criteria. Their analysis yielded a four-factor solution of dysphoria, cued reexperiencing and avoidance, uncued reexperiencing and hyperarousal, and trauma-related rumination. Finally, a

smaller study ($n = 195$) of male combat veterans revealed four factors of intrusion, effortful avoidance, sleep disturbance, and emotional numbing (Amdur & Liberzon, 2001).

All of the four-factor models specify that avoidance and numbing represent separate, distinct factors. Foa, Zinbarg, and Rothbaum's (1992) formulation of PTSD proposes that arousal symptoms produce numbing symptoms, whereas avoidance symptoms occur in response to reexperiencing symptoms. Consistent with Foa et al.'s conceptualization of the relationships between symptom clusters, hierarchical multiple regression analyses have demonstrated that arousal symptoms do indeed explain the majority of the variance in numbing, and reexperiencing symptoms do explain the majority of the variance in avoidance symptoms in rape survivors (Feuer, Nishith, & Resick, 2005; Tull & Roemer, 2003) and in combat veterans (Litz et al., 1997). However, only longitudinal studies can address the direction of causality implied by Foa et al.

Other symptom groupings are possible but have not been explicitly tested. Ford (1999) and Herman (1992) suggest that severe, chronic traumatization may be associated with "complex PTSD" responses of affect and impulse dysregulation, dissociation, somatization, and altered sense of self and relationships. This symptom clustering differs dramatically from the DSM conceptualization of PTSD and would require the use of new measurement instruments that are not based on the current DSM model of PTSD.

As the bulk of studies support a four-factor model, future studies should assess these variants to determine the model that best fits the majority of the data so that the diagnostic criteria can be revised in future versions of the DSM.

PTSD and Non-criterion A Events

The DSM-IV recognizes that some people develop symptoms suggestive of PTSD after stressors that do not meet criterion A (APA, 1994). Although the diagnostic guidelines instruct clinicians and researchers to diagnose an adjustment disorder in these cases, some researchers question whether the symptoms of PTSD are necessarily caused by trauma (e.g., Bodkin, Pope, Detke, & Hudson, 2007).

In the National Comorbidity Survey, only a slight increase in lifetime rates of PTSD was observed when non-criterion A events were included (Kessler et al., 1995). The estimated lifetime prevalence of PTSD rose from 7.8% to 8.4% with the inclusion of non-criterion A events. Studies among clinical populations, however, tend to show a higher prevalence of PTSD in association with non-criterion A events than epidemiological studies. A study of 45 persons with social anxiety disorder and 30 nonanxious controls found that one third of the socially anxious individuals met the symptom criteria for PTSD in response to an extremely stressful social event that did not meet criterion A (Erwin, Heimberg, Marx, & Franklin, 2005). Further, for the 29 participants who reported the presence of a criterion A event and a socially stressful event, similar numbers of reexperiencing and avoidance symptoms were reported for both events, but greater hyperarousal symptoms were reported for their worst socially stressful event compared to their worst criterion A event. This finding suggests that, for persons with social anxiety, socially stressful events may be experienced subjectively as quite traumatic. Similarly, in a study of 103 persons seeking treatment for Major Depressive Disorder, 78% of persons with a criterion A event ($n = 54$) qualified for PTSD; however, 78% of those who did *not* report a criterion A event *also* qualified for PTSD in every way except for the criterion A requirement (Bodkin et al., 2007). In response to their findings, Bodkin and colleagues encourage caution in

attributing PTSD symptoms to trauma in a treatment-seeking population. PTSD symptoms have been observed after divorce (Helzer, Robins, & McEvoy, 1987), extramarital affairs (Attilio, 2004), sexual harassment (Avina & O'Donohue, 2002), and financial difficulties (Scott & Stradling, 1994). These findings suggest that symptoms attributed to PTSD may be non-specific and common to persons experiencing stressful or traumatic events, especially those with mood and anxiety disorders.

The non-specificity of PTSD symptoms to a qualifying criterion A event leads to the question of why some people develop PTSD-like symptoms after events that are *stressful*, but not categorized as *traumatic*. Kessler and colleagues (1995) propose that a broad-based investigation is needed to determine which types of nonqualifying events are most likely to produce PTSD-like symptoms and which persons may be especially vulnerable to developing PTSD symptoms following subthreshold events. This study addressed this issue by examining the relative contribution of event and person characteristics in PTSD symptoms following events that do and do not meet criterion A.

Severity of trauma exposure is an important component of the diagnostic guidelines for PTSD, but evidence of PTSD-like responses to lower magnitude events causes some to question the assumption that PTSD should only be diagnosed for high magnitude events (e.g., Bodkin et al., 2007). Of interest are the relative influences of event and person characteristics in predicting responses to low and high severity events. It is possible that person characteristics are more powerful predictors of PTSD in response to less severe events than they are to high severity events. The sections that follow will review characteristics of events and person factors that predict PTSD symptom severity.

Event Characteristics and PTSD

Specific characteristics of an event influence the probability that the event will lead to PTSD. Certain events are associated more consistently with PTSD than are other events. Even within event categories, traumas vary according to the degree of perceived life threat, extent of physical injury, duration, and, in interpersonal crimes, the victim's relationship to the offender. Additionally, the social support perceived by the individual in association with the event often varies between and within event categories.

Event Type

Events differ in their capacity to produce PTSD. According to data from the National Comorbidity Survey, rape is the event associated with the highest conditional probability of developing PTSD among men and women; sixty-five percent of men and 45.9% of women who reported rape as their most upsetting trauma developed PTSD (Kessler et al., 1995). Other traumas associated with a high probability of PTSD in this epidemiological study include combat exposure, childhood neglect, and childhood physical abuse among men (with PTSD probabilities of 38.8%, 23.9%, and 22.3%, respectively). Among women, in addition to rape, events associated with a high probability of PTSD were childhood physical abuse, being threatened with a weapon, sexual molestation, and physical assault (with PTSD probabilities of 48.5%, 32.6%, 26.5%, and 21.3%, respectively). In contrast, events with a low probability of producing PTSD in men are physical assault (1.8%), being threatened with a weapon (1.9%), natural disaster or fire (3.7%), being shocked by the traumatization of a close acquaintance (4.4%), being in an accident (6.3%), and witnessing someone being killed or badly injured (6.4%). Among women, events with a low probability of producing PTSD are natural disaster or fire (5.4%), witnessing

someone being killed or badly injured (7.5%), being in an accident (8.8%), and being shocked by the traumatization of someone close (10.4%).

With a few exceptions in men, PTSD tends to be most highly associated with direct exposure to interpersonal violence (e.g., rape, physical and sexual abuse, combat exposure, and physical assault or threat with a weapon for women). Less likely to produce PTSD are events that are not directly experienced (e.g., witnessing someone being killed or badly injured, being shocked at the traumatization of another person) and events that are not of an interpersonal nature (e.g., natural disasters, accidents).

Different rates of PTSD for different events have led some researchers to compare the experience of PTSD in different events. Studies suggest that different types of events may be associated with different PTSD symptoms. For example, Solomon and Canino (1990) found that victims of a flood and/or unsafe dioxin levels had more reexperiencing and arousal symptoms than avoidance and numbing symptoms. This finding may be partially explained by avoidance coping literature that suggests that avoidance is adaptive in the short-term for some events, such as rape and childhood sexual abuse, but harmful in the long-term (Coffey, Leitenberg, Henning, Turner, & Bennett, 1996), whereas avoidance may be more maladaptive in the short-term but adaptive in the long-term for other events, such as witnessing someone being killed or seriously injured and surviving life-threatening accidents (Creamer, Burgess, & Pattison, 1992). This pattern suggests that symptom clusters of PTSD may be different for different events, with avoidance symptoms predicting PTSD for interpersonal events but not other events.

Others suggest that responses to multiple, prolonged, or intermittent potentially traumatic events may differ both quantitatively (e.g., PTSD symptom count) and qualitatively (e.g., different PTSD factor structure) from responses to discrete traumatic events (Gurevich, Devins,

& Rodin, 2002). Discrete trauma may include events such as rape, natural disasters, accidents, and single assaults, whereas chronic traumas include events such as war experiences, domestic violence, childhood abuse, and life-threatening illnesses.

Although more research needs to be done before it can be determined whether PTSD should be categorized and researched separately for interpersonal versus other events, recent studies suggest that event characteristics are important in the development and experience of PTSD. The results of the aforementioned studies support comparing events on chronicity and degree of interpersonal involvement.

Life Threat

The degree of perceived life threat has been found in numerous studies to predict a diagnosis of PTSD and symptom severity. Perceived life threat was positively associated with PTSD symptom severity in several studies of women who reported sexual abuse in childhood or rape (Resnick, Kilpatrick, Dansky, Saunders, & Best, 1993; Ullman & Filipas, 2001) and survivors of serious motor vehicle accidents (Blanchard, Hickling, Mitnick, Taylor, Loos, & Buckley, 1995; Delahanty, Raimonde, Spoonster, & Cullado, 2003). Ozer et al.'s (2003) meta-analysis of predictors of PTSD in adults revealed a weighted average correlation of .26 (total n = 3,524) between degree of perceived life threat and PTSD symptoms. They found the link between perceived life threat and PTSD symptoms to be stronger for non-combat interpersonal violence (weighted r = .36) than for serious accidents (r = .20).

Degree of Physical Injury

The relationship between degree of physical injury and PTSD or posttraumatic stress symptom severity is more variable. Several studies find no relationship between physical injury and PTSD diagnosis. In a sample of 138 victims of physical assault, degree of physical injury at

the time of the assault was not a significant predictor of PTSD diagnosis (Johansen, Wahl,

Eilertsen, Hanestad, & Weisaeth, 2006). Delahanty et al.'s (2003) sample of motor vehicle

accident survivors demonstrated lower objective injury severity scores among those with PTSD

than those without PTSD. However, Blanchard et al.'s (1995) study of motor vehicle accident

survivors found significant positive relationships between injury severity and a PTSD diagnosis

($r = .30$) and PTSD symptom count ($r = .31$). Similarly, degree of physical injury during sexual

assault predicted the development of PTSD from the event (Kilpatrick, Saunders, Amick-

McMullan, Best, Veronen, & Resnick, 1989). It is important to note that the studies using

samples of motor vehicle accident survivors (e.g., Blanchard et al.; Delahanty et al.) used

physician ratings of injury severity, whereas the studies of physical and sexual assault survivors

(e.g., Johansen et al., 2006; Kilpatrick et al., 1989) used participants' self-ratings of physical

injury. Results are still mixed even within each type of assessment (self-report versus physician

rating) and event type, so research currently does not definitively support a relationship between

physical injury and PTSD. Perception of life threat appears to be more important in the genesis

of PTSD than extent of physical injury.

Event Duration

Few studies directly test the relationship between event duration and PTSD, but there is

some evidence that traumas of longer duration are more likely to produce PTSD or be associated

with greater symptom severity. Direct evidence of this association was found in a study of

Vietnam veterans, in which longer direct combat exposure was associated with a higher

prevalence of PTSD and more persistent PTSD symptoms (Buydens-Branchey & Noumair,

1990). The strong evidence for the dose-response relationship between trauma and PTSD

reviewed later in this paper (see "prior trauma history" section) also supports the notion that

event duration may partially explain differences in PTSD rates between events (e.g., single motor vehicle accident versus childhood physical abuse) and differences in PTSD development within event categories (e.g., a single act of sexual molestation versus several years of abuse). It could be argued that event duration simply reflects instances of acute or discrete versus chronic exposure, with more discrete exposure observed in motor vehicle accidents, fires, and physical and sexual assaults, and more chronic exposure observed in childhood abuse, combat exposure, and domestic violence. Duration of exposure should be examined and tested in relationship to PTSD in the events most clearly associated with chronic exposure to determine if duration does in fact predict PTSD symptom severity.

Relationship to Offender

Among traumas involving interpersonal events, several studies suggest that sexual assaults by strangers and relatives are related to greater PTSD symptomology than are assaults by acquaintances and romantic partners (Bownes, O'Gorman, & Sayers, 1991; Ullman, Filipas, Townsend, & Starzynski, 2006). Several studies have found stranger assaults to be more violent, produce greater physical injury, and to be associated with higher ratings of perceived life threat than assaults by persons known to the victim (Koss, Dinero, Seibel, & Cox, 1988; Ullman et al.). For interpersonal events, therefore, the relationship of the victim to the offender should be included in the assessment and analysis of risk factors for PTSD symptoms.

Perceived Social Support

Several studies suggest that there is a positive correlation between the stressfulness of an event and the amount of perceived support (e.g., Dunkel-Schetter, Folkman, & Lazarus, 1987; Hobfoll & Lerman, 1989; Kaniasty & Norris, 1991), suggesting a potential moderating effect of received support on the relationship between trauma exposure and PTSD reactions. Consistent

with this theory, social support has been inversely related to PTSD symptoms in female assault victims (Hyman, Gold, & Cott, 2003, Kramer & Green, 1991; Schumm, Briggs-Phillips, & Hobfoll, 2006; Wolfe, Sharkansky, Read, Dawson, Martin, & Ouimette, 1998), Israeli victims of terrorism (Hobfall, Canetti-Nisim, Johnson, Palmieri, Varley, & Galea, 2008), hurricane survivors (Acierno, Ruggiero, Kilpatrick, Resnick, & Galea, 2006), combat veterans (Green & Berlin, 1987; King, King, Foy, Keane, & Fairbank, 1999; Solomon, Mikulincer, & Hobfall, 1987; Sutker, Davis, Uddo, & Ditta, 1995), burn victims (Perry, Difede, Musngi, Frances, & Jacobsberg, 1992), and battered women (Astin, Lawrence, & Foy, 1993; Perrin, Van Hasselt, Basilio, & Hersen, 1996). The receipt of social support may differ according to event characteristics, however. Eckenrode and Wethington (1990) suggest that events that are unambiguously traumatic and visibly distressing are more likely to facilitate supportive responses from others. On the other hand, events that involve stigma, blame, and uncertainty about whether trauma occurred may be associated with less social support (Kaniasty & Norris, 1993). This study assessed the role of self-reported receipt of social support associated with participants' worst events in the prediction of PTSD symptoms.

Event Characteristics Summary

To summarize the state of the literature on the relationships among event characteristics and PTSD, there is strong evidence for a link between PTSD and event type, degree of perceived life threat, and relationship to offender in interpersonal traumas (e.g., rape). Rape, combat exposure, and childhood abuse are consistently associated with higher conditional probabilities of developing PTSD (e.g., Kessler et al., 1995), and interpersonal events are more likely to produce PTSD than non-interpersonal events (e.g., natural disasters, motor vehicle accidents, etc.). Perceived life threat is consistently positively associated with PTSD severity (e.g., Resnick

et al., 1993). Also, there is evidence that sexual assaults by strangers or relatives are more likely to result in PTSD than are assaults by acquaintances and romantic partners (e.g., Bownes et al., 1991). Finally, perceived social support in response to events is associated with fewer PTSD symptoms. All of these factors partially explain the development of PTSD in the sense that more severe events are associated with greater rates of PTSD. Of interest, however, is the relationship of person characteristics to the development of PTSD, as these variables can be used to explain why some persons develop PTSD to less severe events (i.e., events that do not satisfy criterion A) and some persons never develop PTSD after severe events.

Person Characteristics and PTSD

Research has demonstrated that rates of PTSD are different in different groups of people. Factors such as sex, age, socioeconomic status, and previous history of trauma exposure influence risk of both trauma exposure and the development of PTSD.

Sex

Epidemiological studies confirm sex differences in rates of exposure to certain types of events and in the prevalence of PTSD after particular events. Overall, in the United States, women are more than twice as likely as men to develop PTSD at some point in their lives (10.4% versus 5%), although fewer women than men report exposure to a traumatic event in their lifetime (51.2% versus 60.7%; Kessler et al., 1995). Similarly, an epidemiological study in Australia found that 64.6% of men and 49.5% of women reported the occurrence of at least one traumatic event in their lifetime, but 12-month PTSD prevalence rates did not differ significantly, with 1.2% of males and 1.4% of females qualifying for a diagnosis of PTSD in the year prior to the study (Creamer, Burgess, & McFarlane, 2001). Both Kessler et al. and Creamer et al. reported that women were more likely to develop PTSD than men given exposure to most

event categories. Kessler et al. found that 8.1% of men and 20.4% of women who had experienced a traumatic event met PTSD criteria at some point in their lifetime, whereas Creamer et al.'s study found lower rates for men 1.9% and 2.9% women.

Sex differences in PTSD rates following trauma exposure have been explained in several different ways. Women are more likely than men to experience "high risk" traumas that have a high probability of producing PTSD (with the exception of combat exposure), such as rape and sexual abuse (Creamer et al., 2001; Kessler et al., 1995). In fact, the narrower gap between the sexes in the Australian sample compared to the North American sample may be partially explained by the lower rate of reported rape among Australian women (5.4%; Creamer et al.) than American women (9.2%; Kessler et al.).

Another explanation for sex differences in PTSD relates to the greater prevalence of mood and other anxiety disorders in women than in men (Andrews, Henderson, & Hall, 2001; APA, 2000; Cwikel, Zilber, Feinson, & Lerner, 2008; Kessler et al., 1995). History of other psychiatric disorders is a known risk factor in the development of PTSD following trauma exposure (Breslau, Davis, Andreski, Peterson, & Schultz, 1997; Kessler et al., 1995).

A final issue in regard to sex differences in rates of PTSD relates to criterion A2 (i.e., response of intense fear, helplessness, or horror). Several studies suggest that, given an event that satisfies criterion A1, women are more likely than men to fulfill criterion A2 (Breslau & Kessler, 2001; Brewin et al., 2000). Studies examining sex differences in rates of PTSD tend to restrict the definition of trauma to criterion A1 instead of using the full 2-part definition to determine trauma exposure rates.

Age

There is mixed evidence regarding the association of age with PTSD. Lifetime trauma exposure is significantly and positively associated with age among persons in the United States (Kessler et al., 1995), but Creamer et al. found that Australians over age 55 were less likely to report exposure to a criterion A event than younger cohorts. Consistent with North American findings, however, Creamer et al. (2001) found that persons between 25 and 54 were more likely than 18- to 24-year-olds to report at least one traumatic event. They suggested that a problem with examining the relationship between age and trauma exposure is that underreporting of traumatic experiences may increase among older adults due to length of time since traumatization and declining memory. Despite the general tendency for trauma exposure to increase with age, there is not a significant relationship between age and lifetime PTSD among those who reported trauma exposure (Kessler et al.). In fact, adults over 55 are less likely than adults younger than 55 to meet criteria for PTSD in the 12-months prior to the assessment (Creamer et al.). Although it has not been explicitly tested in these epidemiological studies, it is likely that length of time since the occurrence of one's "worst trauma" would be inversely related to current diagnoses of PTSD. Many persons recover from PTSD over time; median time to remission is 36 months among those who obtain treatment and 64 months among those who do not receive treatment (Kessler et al.). Interestingly, however, several studies of women who experienced a sexual assault suggest that time since assault does not predict PTSD symptomology (Ullman & Filipas, 2001; Ullman et al., 2006). Unlike the epidemiological studies mentioned earlier, these latter studies did not determine PTSD diagnoses; rather, they used symptom counts. Given remission rates of PTSD over time, it is likely (although untested in these studies) that time since event does in fact relate to PTSD diagnostic status.

Socioeconomic Status

Evidence on the relationship between socioeconomic status and PTSD is mixed. Epidemiological studies in the United States (e.g., Keane et al., 1995) and Australia (e.g., Creamer et al., 2001) show no association between PTSD diagnoses and education when controlling for other demographic variables, such as age, sex, and marital status. There is some evidence, however, that persons with lower levels of education may report a greater number of PTSD symptoms. For example, in a community-based survey of young adults exposed to a major brush fire in Australia, education was inversely related to number of PTSD symptoms (Parslow, Jorm, & Christensen, 2006). PTSD symptom count was also inversely related to education (Sutker, Bugg, & Allain, 1990; Ursano, Boydstun, & Wheatley, 1981) and socioeconomic status (Sutker et al.; Tennant, Goulston, & Dent, 1986) in prisoners of war. Similarly, education was negatively correlated with number of PTSD symptoms in female sexual assault survivors (Ullman & Filipas, 2001). Psychiatric diagnosis in general, including diagnoses of PTSD, were predicted by less education, less income, and unemployment in a sample of 976 primary care patients in Israel (Cwikel et al., 2008). Although the link between socioeconomic status and PTSD is unclear, the majority of studies use education as a marker of socioeconomic status rather than income (e.g., Creamer et al.; Keane et al.; Parslow et al.; Ullman & Filipas; Ursano et al.). The studies that assess and report income as a marker of socioeconomic status uniformly find income to be negatively associated with PTSD symptoms (e.g., Cwikel et al.; Sutker et al.; Tennant et al.).

Prior Trauma History

A dose-response effect between number of traumas and likelihood of developing PTSD is well-established in the literature. Persons with a history of multiple traumas, whether different

types or related events, are more likely to develop PTSD than are persons who have experienced

a single traumatic event (e.g., Breslau & Kessler, 2001; Kessler et al., 1995). In a sample of 212

undocumented immigrants, the odds of meeting diagnostic criteria for PTSD increased by 1.31

for each traumatic event reported (Rasmussen et al., 2007). Women who have been raped who

have a previous history of assault had a 6.7 times greater likelihood of developing PTSD

following the rape than women who did not have a previous history of sexual assault (Resnick,

Yehuda, Pitman, & Foy, 1995). Similarly, a study of victims of a serious motor vehicle accident

found that persons who met PTSD criteria reported more prior traumatic events than those who

did not develop PTSD (Delahanty et al., 2003). Finally, in a meta-analysis of 23 studies that

assessed trauma histories of persons with and without PTSD, a weighted correlation of .17 was

obtained between number of prior traumas and PTSD symptoms following a selected event

(Ozer, Best, Lipsey, & Weiss, 2003). Ozer et al. noted that the presence of prior traumas was

more strongly related to PTSD when the prior trauma involved non-combat interpersonal

violence (e.g., assault, rape, domestic violence; weighted $r = .27$) than when the prior traumas

were combat-related (weighted $r = .18$) or involved serious accidents (weighted $r = .12$).

Person Characteristics Summary

In sum, personal risk factors for PTSD are female sex and having a history of prior

traumatic events (Kessler et al., 1995). The research on the relationship between age and PTSD

suggests that generally age is unrelated to PTSD (e.g., Kessler et al.), but there may be a lower

prevalence rate of PTSD in adults over the age of 55 (Creamer et al., 2001). Evidence on the

relationship between PTSD and education is inconsistent, but there is limited evidence for a

negative association between household income and PTSD symptom severity (e.g., Cwikel et al.,

2008).

Cognitive Characteristics and PTSD

Certain cognitive variables may play a role in the etiology, maintenance, and remission of PTSD. Cognitive models of PTSD suggest that faulty emotional processing of traumatic events is a key factor in the etiology of PTSD (e.g., Foa, Steketee, & Rothbaum; Horowitz, 1976). Cognitive avoidance strategies prevent emotional memories from consolidating and being assimilated into existing cognitive schemas (Ehlers & Clark, 2000; Horowitz, 1976). It has been theorized that trauma-related information may not be incorporated into existing schemas when it does not fit into relatively rigid patterns (Wells, 2000). Additionally, the role of perceived helplessness or lack of control over outcomes has been deemed influential in the etiology of PTSD (e.g., Mikulincer and Solomon, 1988; Seligman, 1975).

The cognitive models of PTSD suggest that certain general ways of thinking about the world as well as specific beliefs related to events that are experienced should be related to PTSD symptoms. Specifically, worry and rumination as well as experiential avoidance should be risk factors for the development of PTSD symptoms because of their role in avoidance, which may prevent memory consolidation. Benefit-finding and core beliefs should relate to PTSD because each influences the assimilation of trauma-related information into existing schemas. Finally, hardiness and self-efficacy should be negatively associated with PTSD symptoms due to their association with perception of control and ability to cope with traumatic events. It is likely that these variables will also predict PTSD symptoms following events that do not satisfy criterion A; in fact, cognitive factors may explain PTSD symptoms in response to less severe events better than event characteristics do. For example, it might be possible to compare the magnitude of the relationship between these cognitive factors and PTSD symptom severity among those with a

qualifying event with those who do not have a qualifying event. See Figure 1 for a diagram depicting the proposed relationship between cognitive variables and cognitive models of PTSD.

Worry and Rumination

Cognitive models of PTSD stipulate that emotional processing of traumatic events is hindered by avoidant cognitive strategies (e.g., Ehlers & Clark, 2000; Foa et al., 1989; Roussis & Wells, 2005). Emotional processing of traumatic events has been defined as the manipulation in working memory of representations of past and potential events and associated bodily states (Brewin, Dalgleish, & Joseph, 1996). Horowitz's (1976) information-processing model of PTSD explains intrusive thoughts, memories, and feelings as an effort to assimilate trauma-related information into existing cognitive schemas. Wells' (2000) metacognitive model of PTSD maintenance extends this theory and posits that successful emotional processing of a traumatic event requires flexible thought processes, whereas rumination and worry are relatively inflexible in preventing the incorporation of new, nonthreatening information into a person's schema. Rumination and worry serve an avoidant function in the aftermath of trauma by keeping a person's focus on a narrow piece of the experience (as in rumination) or on a potential future experience (as in worry).

Rumination refers to repetitive and recurrent negative thinking about past experiences, whereas worry involves repetitive and recurrent thoughts about potential negative events (Michael, Halligan, Clark, & Ehlers, 2007). Although rumination is more past-oriented whereas worry is more future-oriented, both phenomena inhibit the incorporation of positive information into one's perspective. Rumination among persons with PTSD has been found to involve "why" and "what if" questions (Michael et al.) that are peripheral to the trauma experience itself and prevent full emotional involvement in processing the experience in its entirety. Thinking about

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                        ┌─────────────────────────┐
                        │  Cognitive Models of PTSD │
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| Theory: Avoidance keeps memories from consolidating (e.g., Ehlers & Clark, 2000; Foa et al., 1989). | Theory: Information is not consistent with pre-existing cognitive schemas and is not incorporated adequately (e.g., Janoff-Bulman,1989; Wells, 2000). | Theory: Helplessness and perception of no control lead to inadequate coping (e.g., Mikulincer & Solomon, 1988; Seligman, 1975). |

| Worry and rumination | Experiential avoidance | Benefit-Finding | Core Beliefs | Hardiness | Self-efficacy |

Figure 1. *Cognitive Variables Related to Cognitive Models of PTSD*

causes and consequences of an event results in the avoidance of reliving the event and thereby

interferes with consolidation of trauma memories (Ehlers & Clark, 2000). Similarly, worry is

conceptualized as a thought control strategy (e.g., Roussis & Wells, 2005) by involving a focus

on events that have not actually happened as opposed to processing the event that did happen.

Several studies support the role of rumination and worry in PTSD maintenance.

Rumination as assessed within 3 months of a physical or sexual assault was positively associated

with PTSD severity six months later (Michael et al., 2007). Steil and Ehlers (2000) conducted

two studies with survivors of serious motor vehicle accidents and found that rumination was

positively correlated with PTSD symptom severity (partial correlations of .27 to .56) even after

controlling for frequency of intrusive memories, accident severity, and several other cognitive

variables. Ehlers, Mayou, and Bryant (1998) similarly found that rumination and a general

tendency to worry at 3 months after a motor vehicle accident predicted PTSD symptom severity

and diagnosis at 3 months and also again at one year after the accident. These studies suggest that rumination and worry may play a role in the etiology of PTSD as well as in the maintenance of PTSD over the course of a year after the identified event. In another sample of survivors of serious motor vehicle accidents, scores on a measure of general tendency to worry given to participants within one month of the accident significantly contributed to the later development of PTSD (Holeva, Tarrier, & Wells, 2001). Roussis and Wells' (2006) cross-sectional study of posttraumatic stress symptoms in college students who reported exposure to a broad array of traumatic events also revealed a significant, positive relationship between worry and PTSD symptoms. Regardless of the function of worry and rumination as avoidance strategies after traumatic events, they are consistently associated with greater PTSD symptom severity.

Experiential Avoidance

Avoidance may take different forms, such as cognitive, emotional, and behavioral, and may be relegated to very specific instances or may manifest as a chronic phenomenon when it is used as a general coping strategy for managing difficult emotions. Experiential avoidance has been described as encompassing cognitive, emotional, and behavioral aspects of avoidance in response to specific memories or situations.

> Experiential avoidance is the phenomenon that occurs when a person is unwilling to remain in contact with particular 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).

Whether used situationally or habitually, avoidance of trauma-related cues seems to play a role in the development and maintenance of PTSD. Hayes et al. (1996) postulate that

experiential avoidance may be harmful because thoughts and feelings are often paradoxically increased by deliberate control efforts. In addition, avoidance can interfere with adaptive life functioning and with the process of healthy behavioral change. Evidence for the harmful effects of avoidance postulated by Hayes et al. is mixed. Studies using measures of thought suppression are generally supportive of the prediction that avoidance has negative consequences. Thought suppression has been conceptualized as a process that involves a conscious, effortful search for distracters, and an unconscious monitoring process that searches for the unwanted thought (Wegner & Zanakos, 1994). Thought suppression has been shown to be related to hypersensitivity to depressing and anxiety-provoking thoughts, demonstrating significant positive correlations of weak to moderate strength with depression, obsessive-compulsive symptoms, trait anxiety, and sensitivity to anxiety (Wegner & Zanakos). Thought suppression is also stable over time (test-retest correlations range from .69 to .92; Wegner & Zanakos), suggesting that persons may exhibit a general tendency to engage in this process.

Few studies have assessed for the use of thought suppression in trauma survivors, but Wegner and Zanakos' (1994) finding that thought suppression is related to anxiety sensitivity implies that the use of thought suppression may be positively associated with PTSD symptoms, particularly intrusive symptoms. Consistent with this expectation, Steil and Ehlers (2000) found that thought suppression indeed correlated positively with PTSD symptom severity in two samples of motor vehicle accident survivors. Partial correlations ranged from .34 to .36 when the relationship between thought suppression and PTSD symptoms was controlled for frequency of intrusive memories, accident severity, and other cognitive variables. In a sample of undergraduate students who reported no trauma history, Davies and Clark (1998) showed participants either a distressing film about a natural disaster or a neutral film about polar bears.

They found a rebound effect (i.e., an increase of target thoughts compared to baseline after a period of suppression) following instructed thought suppression for those exposed to the distressing film but not for those exposed to the neutral film. The authors suggested that emotionally charged material is more susceptible to a rebound effect following suppression than is less emotionally charged material, supporting the theory that avoidance of trauma-related stimuli may not work well in the long-term and lead to an increase in trauma-related intrusive thoughts and feelings.

Several experimental studies have examined the effects of induced thought suppression in persons exposed to traumatic events. Results differ depending on the type of sample and length of time since the traumatic event. Harvey and Bryant (1998) compared inpatient motor vehicle accident victims with ($n = 24$) and without ($n = 24$) acute stress disorder (ASD). Both groups showed a rebound in trauma-related thoughts in the time period (5 minutes) after the block of time (5 minutes) when they were instructed to suppress the thoughts. Participants who were not instructed to suppress any thoughts showed no significant difference in the number of trauma-related thoughts from their baseline measurements (5 minute interval before instructed suppression). Guthrie and Bryant (2000) extended the interval between instructed thought suppression and follow-up to 24 hours in another sample of inpatients hospitalized for motor vehicle accident injuries. With the extension of time between suppression and the subsequent measurement, they found no evidence for a rebound in trauma-related thoughts.

While the relationship between thought suppression and ASD is unclear based on conflicting results from the two experimental studies of motor vehicle accident survivors, a more consistent relationship has emerged between thought suppression and chronic PTSD. Shipherd and Beck (1999) examined deliberate thought suppression in female sexual assault survivors

with and without chronic PTSD. Sexual assault survivors with chronic PTSD, but not women without PTSD, showed an increase of trauma-related thoughts after suppression. Shipherd and Beck (2005) added a condition of instruction to suppress a personally relevant neutral thought in a sample of survivors of serious motor vehicle accidents. They found that persons with PTSD showed a rebound effect following suppression of trauma-related thoughts but not after suppression of neutral thoughts. The non-PTSD group did not experience a rebound effect after suppressing either neutral or trauma-related thoughts. Conflicting results were obtained, however, in a sample of 44 PTSD-positive and 26 PTSD-negative survivors of serious motor vehicle accidents, with both groups showing a rebound in trauma-related thoughts following deliberate thought suppression (Beck, Gudmundsdottir, Palyo, Miller, & Grant, 2006). This sample, unlike the others, included only help-seeking individuals from a university-based clinic, all of whom were seeking therapy for emotional distress related to their motor vehicle accident. Thought suppression may play a role in the maintenance of PTSD symptoms and generalized trauma-related distress (without full-blown PTSD) following a trauma.

Studies of more general avoidance than thought suppression tend to find avoidance to be adaptive in the immediate aftermath of a trauma and harmful when it is more long-term. According to theory, avoidance coping allows persons to confront their experiences in manageable doses in the short-term aftermath of a trauma but interferes with emotional processing in the long-term (Lazarus & Folkman, 1984; Ruth & Cohen, 1986). Avoidance in terms of suppressing negative thoughts and keeping busy have been found to be associated with less distress immediately following a rape (Frazier & Burnett, 1994), whereas avoidance coping at least one year after a rape has been found to predict PTSD symptoms (Coffey et al., 1996; Ullman, 1996). Boeschen, Koss, Figueredo, and Coan (2001) used structural equation modeling

to model the pathways by which certain cognitive variables affect PTSD in 139 rape survivors. They found that experiential avoidance was related to PTSD symptom severity through its association with behavioral self-blame (i.e., blaming one's own behaviors for the event, such as "I should not have walked home alone"). Experiential avoidance had a direct positive effect on behavioral self-blame, which predicted reexperiencing symptoms of PTSD. Overall, however, the effect of experiential avoidance was quite small compared to the effect of other cognitive predictors, such as disrupted beliefs and blame.

In summary, research linking avoidance and PTSD suggests that thought suppression and long-term use of avoidant coping are associated with increased PTSD symptoms (e.g., Coffey et al., 1996; Steil & Ehlers, 2000; Ullman, 1996), but these effects may be small in comparison to the effects of other cognitive processes on the development and maintenance of PTSD (e.g., Boeschen et al., 2001).

Benefit-finding

Survivors of traumas sometimes express thoughts that reflect a perception of benefit from their traumatic experiences. This phenomenon has been reported for a diverse range of traumas, including disasters (McMillen et al., 1997), rape (Burt & Katz, 1987), heart attacks (Affleck, Tennen, Croog, & Levine, 1987), child sexual abuse (McMillen, Zuravin, & Rideout, 1995), and fires (Thompson, 1985). Tedeschi and Calhoun (1996) grouped benefits reported from samples of persons exposed to serious illnesses, severe burns, natural disaster, and rape into three categories in the development of their Posttraumatic Growth Inventory. They categorized benefits in terms of positive self-change (e.g., emotional growth, feeling more experienced and competent), changes in approach to relationships (e.g., closer family relationships, increase in

self-disclosure), and changes in life philosophy (e.g., increased appreciation for one's own existence, change in priorities, stronger religious beliefs).

Several theoretical explanations for benefit-finding and adjustment have been proposed. Benefit-finding may be an indicator that emotional processing of a trauma has occurred (McMillen et al., 1997). Cognitive models of PTSD that were discussed earlier (e.g., Horowitz, 1976; Wells, 2000) posit that PTSD occurs when information that conflicts with existing schemas is diverted from immediate awareness where it causes intrusions and PTSD symptoms due to its unprocessed status. Benefit-finding, therefore, may represent either an active attempt to incorporate traumatic material into existing cognitive schemas, or it may reflect an outcome of adequate processing.

Although benefit-finding tends to be associated with some measures of positive adjustment (e.g., Affleck et al., 1987; Thompson, 1985), its relationship to PTSD is not consistently borne out in the literature. McMillen et al. (1997) found that perceived benefit 4 to 6 weeks after exposure to trauma (three samples: tornado, mass killing, and plane crash) predicted PTSD three years later. In their study, lower perception of benefit increased the odds of having a diagnosis of PTSD. They found that benefit-finding moderated the effect of the severity of exposure on mental health diagnoses over time. Without perceived benefit, as exposure severity increased, the amount of recovery decreased, whereas the opposite trend was present in those who perceived benefit. The majority of studies, however, find benefit-finding to correlate positively with some measures of wellbeing but not measures of PTSD. McMillen and Fisher (1998) found that scales of perceived benefit correlated positively with general perception of wellbeing but not at all or inversely with mental health symptoms of intrusive symptoms and depression. The finding that increased benefit finding was inversely related to symptoms

suggests that the perception of benefit may be triggered by severity of negative symptoms associated with the stressor. Consistent with this reasoning, Tedeschi and Calhoun (1996) found that more severe traumas were associated with more perceived benefits than were less severe traumas. In ratings of participants' worst events, sixty percent of their sample of 604 undergraduates reported *positive* effects ranging in magnitude from "some" to "extreme," whereas 94% reported *negative* effects ranging in magnitude from "some" to "extreme," suggesting that benefit-finding does not represent a denial of harm. With the exception of McMillen et al.'s study of survivors of a tornado, mass killing, and plane crash, the studies of benefit-finding and PTSD symptoms do not separate criterion A events from events that, while perceived as stressful by respondents, do not meet criterion A. Because of the documented associations between stressor severity and number of benefits reported (e.g., McMillen & Fisher; Tedeschi & Calhoun) and because of the implications of cognitive conceptualizations of PTSD that suggest that benefit-finding may represent emotional processing, it is important to assess the relationship between benefit-finding and PTSD symptoms associated with criterion A events.

Core Beliefs

Cognitive models of PTSD posit that negative beliefs about one's self, one's safety, and the nature of the world after a trauma maintain a sense of ongoing threat (Ehlers & Steil, 1995). When individuals question their self-worth, their safety, and the benevolence of the world, a sense of apprehension and uncertainty can emerge, which serves to maintain symptoms of PTSD (Dunmore, Clark, & Ehlers, 1999). Janoff-Bulman's (1985, 1989) "shattered assumptions" conceptualization of trauma reactions suggests that persons who hold more positive beliefs before a trauma may be most vulnerable to PTSD because of the tremendous incongruence between their pretrauma cognitive schema and their experience of traumatization. On the other

hand, Foa and Riggs (1993) argue that negative pretrauma beliefs may also be confirmed by traumatic events and cause more distress. To reconcile these contrasting theories, Foa and Riggs and Foa and Rothbaum (1998) suggested that the presence of *rigid* beliefs that are either overly optimistic or pessimistic may render persons vulnerable to PTSD, which is consistent with the literature on worry and rumination (e.g., Wells, 2000). These inflexible patterns of thinking increase individuals' vulnerability to psychopathology because they cannot assimilate their experiences into their worldview.

Epstein (1991) proposed that core beliefs that may change (or be strengthened) after trauma are beliefs that the world is benign and meaningful, that the self is worthy, and that people are trustworthy. How individuals interpret the meaning of the trauma affects how they will assimilate the event into their cognitive schemas and may influence the development of PTSD (Ehlers & Steil, 1995).

The Posttraumatic Cognitions Inventory (PTCI; Foa, Ehlers, Clark, Tolin, & Orsillo, 1999) was developed to assess posttraumatic cognitions and has been used in several studies of trauma survivors. Foa et al. found that all three scales (i.e., negative cognitions about self, negative cognitions about world, and self-blame) correlated positively with PTSD severity even after controlling for depression, state anxiety, age, sex, and race.

Studies support the relationship between negative cognitions about self and PTSD. In a sample of 853 college students (Moser, Hajcak, Simons, & Foa, 2007), only negative cognitions about self predicted PTSD symptom severity ($B = .39$) after controlling for sex, negative affect, and the other two scales of the PTCI (i.e., self-blame and negative cognitions about world). The role of negative cognitions about self in PTSD was also supported in O'Donnell, Elliott, Wolfgang, and Creamer's (2007) sample of 253 injury survivors, in which negative cognitions

about self predicted PTSD at 3 months post-injury after controlling for acute symptom severity. Similarly, Startup, Makgekgenene, and Webster (2007) found that high scores on the negative cognitions of self scale of the PTCI increased the odds of having PTSD by three-fold.

The relationship between negative self-appraisals and PTSD is supported by theories of PTSD maintenance. As anxiety increases, some persons use avoidant strategies that increase intrusive and hyperarousal symptoms and thereby confirm one's negative self-appraisal (O'Donnell et al., 2007).

The research on the role of self-blame in PTSD is mixed. Greater self-blame is related to fewer PTSD symptoms in studies of accident survivors (e.g., Delahanty et al., 1997; Hickling, Blanchard, Buckley, Taylor, 1999; O'Donnell et al., 2007) and greater PTSD symptom severity in studies of rape and sexual abuse survivors (Frazier, 2003).[1]

The PTCI scale of negative beliefs about world has not received as much support in its role in PTSD as negative cognitions about self and self-blame have. It did not relate to PTSD after controlling for other variables in a sample of college students (Moser et al., 2007) and in a community sample of persons exposed to a variety of trauma types (Startup et al., 2007). Negative cognitions about the world may play a role in the maintenance of persistent PTSD, however. Negative cognitions did not predict PTSD severity at 3 months after an accident but were stronger predictors of PTSD 12 months post-accident than other cognitive variables were (i.e., negative cognitions about self and self-blame; O'Donnell et al., 2007).

Other researchers have focused on the perceived *change* in beliefs following a trauma, as suggested by Janoff-Bulman's (1985, 1989) position that trauma can shatter assumptions about the nature of self and the world. Dunmore et al. (1999) asked 92 survivors of physical or sexual

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[1] Foa et al. (1999) found higher self-blame predicted PTSD severity, but nearly half of the participants were victims of sexual assault.

assault to rate their current beliefs as well as to retrospectively rate their beliefs before their assault. Beliefs were related to alienation and isolation, being unable to trust others or one's self, negativity about core aspects of one's self, lack of fairness and safety in the world, and negativity about victims and emotional problems. Persons with current PTSD reported significantly more negative beliefs both before and after the assault than did the assault survivors without PTSD. Additionally, those with PTSD showed a significantly greater shift towards holding more negative beliefs after the assault. The authors of the study also compared persons with a history of PTSD from the assault who no longer met criteria for PTSD (i.e., recovered group) with those who currently met criteria in order to determine the role of negative cognitions in the maintenance of persistent PTSD. The persistent PTSD group (i.e., those who met criteria for PTSD at the time of the study) reported significantly more negative beliefs after the assault than the recovered group and exhibited a greater shift towards holding more negative beliefs after the assault than the recovered group.

In a prospective study, Dunmore, Clark, and Ehlers (2001) found that negative beliefs after an assault were positively correlated with PTSD severity at entry into the study (within 4 months of the assault) and at 6 months and 9 months post-assault. Negative beliefs before the assault (i.e., retrospectively reported within four months of the assault) were significant predictors of PTSD at 6 and 9 months but not at entry and remained significant after controlling for PTSD severity at entry. When a control group of never assaulted persons was added to the previous sample, postassault beliefs of the PTSD group were more negative than the beliefs of the never assaulted and the no-PTSD assault groups (Ali, Dunmore, Clark, & Ehlers, 2002). Interestingly, the no-PTSD assault group reported more positive preassault beliefs overall than

the never assaulted group, suggesting that positive preassault beliefs may play a buffering role that minimizes the impact of assault.

In summary, core beliefs about self-blame and the nature of one's self and the world are theorized to play a role in PTSD development and maintenance when the beliefs are rigid (Foa & Rothbaum, 1998). The literature clearly supports the relationship between negative appraisals of one's self and PTSD (e.g., Moser et al., 2007), but there is mixed evidence for other core beliefs. Studies currently use belief ratings to predict PTSD symptoms, but the rigidity of these beliefs is unclear in the current manner of assessment.

Hardiness

Kobasa (1979) introduced the concept of hardiness to describe a characteristic way of approaching and interpreting experiences in terms of three components: a) commitment (versus alienation), defined as a sense of purpose and meaning; b) control (versus helplessness), defined as a sense of autonomy and ability to influence one's life; and c) challenge (versus threat), defined as the tendency to perceive changes as opportunities for growth rather than threats to security. Hardiness is theorized to provide a buffering effect against stress and has been associated with fewer physical and mental health symptoms (Bartone, Ursano, Wright, & Ingraham, 1989; Kobasa, Maddi, Puccetti, & Zola, 1985).

Hardiness has been associated with a decreased risk of PTSD following trauma in several samples of combat veterans. Zakin, Solomon, and Neria (2003) found that hardiness had a direct main effect on PTSD, with hardiness inversely related to PTSD in a sample of 353 prisons of war and combat veterans. Hardiness was also found to be inversely related to PTSD symptoms in both men and women who were Vietnam veterans (King et al., 1999). Taft, Stern, King, and

King (1999) found that hardiness mediated the relationship between combat exposure and PTSD in 1632 Vietnam veterans.

Although measures of hardiness are infrequently included in studies with civilian samples, Kobasa's (1979) dimensions of commitment, control, and challenge appear in various forms throughout the literature. Recently, benefit-finding has been studied in relation to PTSD after trauma (e.g., McMillen et al., 1997) and resembles the commitment and challenge components of hardiness by its focus on tendencies to find purpose and meaning in traumatic events and to view hardships as challenges that can result in personal growth and other benefits. Kobasa's hardiness dimension of control resembles variables of personal control and self-efficacy assessed in recent studies of trauma survivors (e.g., Benight & Harper, 2002; Regehr, Cadell, & Jansen, 1999).

Self-efficacy

Cognitive models of PTSD posit that individuals need to emotionally and cognitively process traumatic events, a process that, when hindered, can result in the development or maintenance of PTSD symptoms (e.g., Horowitz, 1976; Wells, 2000). Persons differ in their perceptions about their coping efficacy, however, and perceptions of efficacy may be associated with resilience. Bandura's (1997) social-cognitive theory of human behavior states that people are direct agents who shape and respond to environmental conditions. Coping self-efficacy, or the perceived capability for managing posttraumatic recovery demands, affects how emotions are handled and how coping strategies are orchestrated (Benight & Harper, 2002). It has been theorized that ineffective coping, high levels of emotional distress, and difficult environmental conditions can decrease perceptions of self-efficacy (Benight & Harper). Low perceptions of self-efficacy can, in turn, impair coping behaviors by reducing perseverance and the adoption of

effective coping strategies (Bandura, 1997). Even though self-efficacy may change in response to circumstances and experiences, there is evidence that some appraisals of self-efficacy arise from enduring beliefs that people have about themselves (Bandura). Moderate test-retest correlations (*r*s ranging from .40 to .68) of self-efficacy at 3-month, 6-month, and 12-month intervals from baseline have been reported in a sample of HIV-positive men (Chesney, Neilands, Chambers, Taylor, & Folkman).

Cross-sectional studies of trauma survivors support the status of self-efficacy as a marker of resilience. Benight et al. (1997) reported that coping self-efficacy accounted for 51% of variance in PTSD symptoms above and beyond the variance accounted for by threat of death, CD4 counts (i.e., a measure of immune functioning), estimated damage, income, and education in a sample of HIV-positive men following Hurricane Andrew. Similar results were obtained in a study with Oklahoma City bombing survivors, with 28% of the variance in PTSD symptoms accounted for by coping self-efficacy after controlling for threat of death, income, social support, and lost resources (Benight et al., 2000). Lower coping self-efficacy has been associated with worse PTSD symptoms among military samples with PTSD symptoms one year after the Lebanon war (Solomon, Weisenberg, Schwarzwald, & Mikulincer, 1988) and two years after the Lebanon war (Solomon, Benbenishty, & Mikulincer, 1991). Enduring beliefs of personal competence and control were also associated with lower rates of depression and posttraumatic stress symptoms in a sample of women who had been raped 1 to 11 years prior to their inclusion in the study (Regehr et al., 1999).

Longitudinal studies also support the role of perceived self-efficacy in resilience. Benight et al. (1999) conducted a longitudinal causal model analysis on responses from survivors of Hurricane Andrew and found that coping self-efficacy soon after the hurricane had a direct

negative pathway to psychological distress soon after the hurricane and also to distress 9 months later. Benight and Harper (2002) collected data on coping self-efficacy and PTSD from persons exposed to both a large fire and flash flood within two months of each other. They found that coping self-efficacy predicted PTSD symptoms at 3 to 8 weeks after the second disaster and also at 1 year later. They found that coping self-efficacy served as a mediator between acute stress response (e.g., dissociation, feelings of helplessness, and physiological symptoms of anxiety) at the time of the trauma and PTSD symptoms one year later. Finally, in a 2-year prospective follow-up study of firefighters, pretraumatic characteristics of hostility and self-efficacy assessed immediately after basic training accounted for 42% of the variance in posttraumatic stress symptoms after two years (Heinrichs et al., 2005). Thus, when taken together, these findings suggest that low coping self-efficacy is not simply a symptom of PTSD but is causally related to the emergence of PTSD.

In sum, these studies point to the role of self-efficacy in adaptive coping following trauma. Persons with greater confidence in their general ability to manage their reactions to stressful events show lower levels of distress following trauma than persons with lower levels of self-efficacy.

Cognitive Characteristics Summary

Cognitive risk factors associated with PTSD development or maintenance include worry and rumination (e.g., Ehlers et al., 1998), thought suppression in PTSD maintenance (e.g., Steil & Ehlers, 2000), experiential avoidance in chronic PTSD (e.g., Coffey et al., 1996), and negative core beliefs about one's self (e.g., Startup et al., 2007). Hardiness and self-efficacy predict resilience after trauma exposure (e.g., Benight et al., 1997; King et al., 1999), but studies of

hardiness are confined to military samples. The association between PTSD and benefit-finding, negative beliefs about the world, and self-blame is not consistently observed.

Summary of Current Study

This study examined the relative contributions of event and personal characteristics in the maintenance of PTSD symptoms in responses to events that do and do not meet criterion A.[2] The study tested cognitive models of PTSD that suggest that PTSD symptoms arise from avoidance (e.g., Ehlers & Clark, 2000; Foa et al., 1989), the presence of information incompatible with pre-existing cognitive schemas (Janoff-Bulman, 1989; Wells, 2000), and the perception of helplessness (Mikulincer & Solomon, 1988; Seligman, 1975). These predictors were used in conjunction with event characteristics and person characteristics to predict PTSD symptoms to events that do and do not meet criterion A1. Of particular interest was the relative ability of these cognitive characteristics to predict PTSD symptoms to lower magnitude events (i.e., criterion A unmet). It is possible that the development of PTSD symptoms to lower magnitude events can be explained by the presence of cognitive risk factors that play a role in the very etiology of PTSD.

Event characteristics that were evaluated for their predictive capacity included event type, degree of perceived life threat, extent of physical injury, event duration (e.g., acute versus chronic), relationship to offender for interpersonal events, and received social support associated with the event. Personal characteristics that were assessed and analyzed as predictors of PTSD symptoms were sex, age, socioeconomic status, and trauma history. Finally, cognitive factors that were incorporated into the predictive formula included worry, experiential avoidance, benefit-finding, core beliefs, hardiness, and, self-efficacy.

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[2] Unless otherwise stated, satisfaction of criterion A means that both criterion A1 and criterion A2 are met.

Additionally, in response to criticisms of the DSM-IV's conceptualization of PTSD (e.g., Asmundson et al., 2000; Weathers & Keane, 2007), both criterion A1 and A2 were assessed, and feelings of shock, anger, and shame were assessed in addition to the feelings of fear, helplessness, or horror stipulated in the diagnostic criteria. The factor structure of PTSD was also examined for PTSD symptoms related to criterion A events and non-criterion A events.

Hypotheses

The present investigation had several aims. First, it was designed to assess the relative contribution of event and person characteristics to PTSD symptom development in a sample of persons exposed to a variety of types of trauma. Second, it was designed to assess the predictors of PTSD symptoms in response to events that do not satisfy criterion A (in its entirety) in the DSM-IV's diagnostic system. Third, this study reexamined the nature of PTSD as described in the DSM-IV by assessing the impact of expanding criterion A2 to include other emotional reactions and by reexamining the factor structure of PTSD symptoms. See Figure 2 for a diagram that includes the instruments that were used to assess each component of the cognitive model.

Based on existing literature, the following hypotheses were made:

1. Event and person characteristics would predict PTSD symptoms in response to events that satisfy criterion A. Event characteristics associated with greater PTSD symptomology would include event type (interpersonal greater than non-interpersonal), higher degree of perceived threat, longer event duration, lower perceived support related to the event, and closer relationship with the assailant for

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                        │  Cognitive Models of PTSD │
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| Theory: Avoidance keeps memories from consolidating (e.g., Ehlers & Clark, 2000; Foa et al., 1989). | Theory: Information is not consistent with pre-existing cognitive schemas and is not incorporated adequately (e.g., Janoff-Bulman,1989; Wells, 2000). | Theory: Helplessness and perception of no control lead to inadequate coping (e.g., Mikulincer & Solomon, 1988; Seligman, 1975). |

| Worry and rumination | Experiential avoidance | Benefit-Finding | Core Beliefs | Hardiness | Self-efficacy |

| PSWQ WBSI | AAQ | PTGI | PTCI | DRI | SES, CSE, ACQ |

Figure 2. *Cognitive Variables and Measures Related to Cognitive Models of PTSD*

interpersonal events. Person characteristics that predict PTSD symptoms would

include female sex, lower socioeconomic status in family of origin, and a history of

exposure to multiple traumatic events. Cognitive characteristics that predict greater

PTSD symptom severity would be worry, experiential avoidance, and negative core

beliefs, whereas benefit-finding, hardiness and self-efficacy would be associated with

lower PTSD symptom severity. The literature is mixed on the relationships between

PTSD and degree of injury and age, so analyses of these variables was exploratory.

2. Person characteristics and cognitive characteristics would also predict PTSD symptoms in response to events that do not satisfy criterion A. Cognitive characteristics would predict PTSD symptoms above and beyond the influence of event and person characteristics. Further, person and cognitive characteristics would be stronger predictors of PTSD than event characteristics would be for events that do not satisfy criterion A.

3. Cognitive variables would mediate the relationship between trauma exposure and PTSD symptoms.

4. Retrospective reports of feelings of shock, anger, or shame after participants' reported worst events would predict PTSD symptoms. These feelings are expanded elements of criterion A2.

5. The viability of two 4-factor measurement models was compared to the current 3-factor DSM-IV model. Specifically, it was hypothesized that King et al.'s (1998) four-factor intercorrelated numbing model and Simms et al.'s (2002) intercorrelated four-factor dysphoria model would fit the data from both groups better than the DSM-IV hierarchical three-factor model.

Method

Participants

Eligible participants were students 18 years of age or older at Eastern Michigan University. The participants received extra credit in one of their psychology classes in an amount that was determined by their instructor upon completion of the study questionnaires. The goal was to recruit at least 340 participants for participation in this study. The sample size for this study was selected to maximize power. A sample size of at least 245 participants was needed to

achieve a power of at least .8 using multiple regression, assuming a maximum of 30 predictors, a significance level of .01, and a moderate effect size of .15 (Cohen, 1988). The sample size of at least 340 was selected to ensure a large enough sample to also conduct a confirmatory factor analysis of the PTSD Checklist to test various proposed PTSD factor structures for participants who do and do not meet criterion A. Comrey and Lee (1992) as well as Tabachnick and Fidell (2001) advise that factor analysis should be conducted on large sample sizes. According to their guidelines, 50 cases is very poor, 100 is poor, 200 is fair, 300 is good, 500 is very good, and 1000 or more is excellent. As a rule of thumb, a minimum of 10 observations per variable is necessary to avoid computational difficulties (Tabachnick & Fidell), so for the 17-item PCL-C, the sample size should be at least 170. Assuming relatively equal numbers of persons who satisfy and do not satisfy criterion A, a sample size of 340 was required in order to run two confirmatory factor analyses.

Measures

The Questionnaire battery was composed of twelve measures. These instruments assessed characteristics of traumatic and stressful life events to which respondents were exposed, responses to these life experiences, and a variety of cognitive factors (Appendices A-L). Each of the measures is briefly described in this section.

Demographic Questionnaire. The demographic questionnaire was developed for the purposes of this study and contains items assessing participant age, sex, relationship status (e.g., married, single, living with partner, etc.), class status (e.g., freshman, sophomore, etc.), racial background, approximate income and perceived economic situation (e.g., *barely enough to get by* to *plenty of luxuries*) of childhood family, living situation (e.g., with family, alone, etc.),

employment status, and therapy history (i.e., number of sessions). See Appendix A for a copy of the Demographic Questionnaire.

Traumatic Events Questionnaire (TEQ)-Revised. The TEQ (Vrana & Lauterbach, 1994) assesses exposure to traumatic events that have the potential to elicit symptoms of posttraumatic stress. The items address the following types of trauma: (1) serious industrial, farm, or automobile accidents and /or large fires or explosions; (2) sexual assault or rape; (3) natural disasters; (4) violent crimes; (5) abusive relationships in adulthood; (6) physical or sexual abuse in childhood; (7) witnessing a serious injury or violent death; (8) being in a dangerous situation; and (9) receiving news of the unexpected death of a loved one. The instrument also includes two residual categories that allow respondents to describe any traumatic events they have experienced that do not fit into one of the listed categories or events that they do not feel comfortable identifying.

The TEQ assesses the type, number, and impact of each experienced trauma. Respondents were asked to indicate whether they have experienced the event described in the particular item, and they move on to the next item if they report that they did not experience the event. For each event that they report experiencing, respondents recorded the number of times it happened and how old they were at the time of the event. Respondents also rated the severity of the event along the following four dimensions: (a) severity of injuries, (b) degree to which they felt that their lives were endangered, (c) how traumatic the event was for them at the time, and (d) how traumatic the event is for them currently. The items assessing severity were summed to form an index of trauma intensity. Each of the severity ratings were made on a seven-point Likert-type scale anchored by 1 = *not at all* and 7 = *severely/extremely*. Persons endorsing more than one event were asked to indicate which was the most traumatic. Participants who reported

experiencing no traumatic events were asked to briefly describe the worst event to happen to them.

The temporal stability of the TEQ appears to be high over a two-week test-retest interval (Lauterbach & Vrana, 1993). The TEQ reliably assessed the number of events ($r = .91$) and the occurrence of specific events experienced by the respondents (range of $r = .72$ for dangerous situations to $r = 1.0$ for child abuse).

This study used a modified version of the TEQ to better address the hypotheses of this study. To shorten the scale and simplify scoring, items 8 (i.e., being in a dangerous situation) and the two residual categories were replaced by a single item that asks about any other trauma and provides a list of events that could be endorsed. These events include near drowning, suicide attempt, serious illness, miscarriage, abortion, kidnapping, combat experience, being attacked by an animal, and being a refugee. The events were grouped together in a single item, because they were expected to be endorsed less frequently in a university student sample than other events on the TEQ. These additional events added to the TEQ were taken from the National Comorbidity Survey-Replication trauma history questionnaire (Kessler et al., 2004). For traumas of an interpersonal nature (i.e., assault, physical or sexual abuse, rape), this revised version of the TEQ asks participants to indicate the nature of their relationship to the perpetrator (e.g., parent, sibling, other relative, friend, acquaintance, stranger) and rate their degree of closeness to the perpetrator on a seven-point Likert-type scale anchored by 1 = *not at all close* and 7 = *extremely close*. At the end of the questionnaire, participants were instructed to write in their most traumatic experience if it was not listed earlier in the questionnaire. A list of events was provided to assist participants in identifying their worst experience. Events on the list include parents' divorce, serious financial problems, breaking a limb, experiencing verbal abuse, moving to a new

place to live, breaking up with somebody, a relative or other person dying even though it was expected (e.g., from cancer, or a heart attack or stroke at a late age), failing a class, getting arrested, getting pulled over by a police officer when driving, getting in a physical altercation, getting lost, having no place to live, getting into a minor traffic accident, infidelity in an intimate relationship, being diagnosed with a sexually transmitted disease, losing one's job, and entering into a relationship despite parents' disapproval. The event list was developed by consulting with a psychologist at a university counseling center and is based on a presentation examining the nature of traumas and stressful events reported by university students (Lauterbach, Gloster, & Hayes, 2002). Participants were then instructed to keep the most traumatic experience in mind as they answered questions pertaining to their feelings during the event and their perception of social support associated with the event. To assess criterion A2, an item was added to the TEQ which asks participants to rate their level of fear, helplessness, horror, anger, shock or numbness, and shame or guilt at the time of the worst event. To assess support received in response to the worst event, four items were added to the TEQ asking participants to rate the level of support they felt surrounding the event at the time of the event and currently. They were asked to indicate how much support they felt was *available* at the time, how much support they felt they *received* at the time, how helpful the support was at the time, and much support they receive *now* related to the event. Items were rated on a 7-point Likert-type scale anchored by 1 = *none* and 7 = *a great deal.* See Appendix B for a copy of the revised TEQ.

Posttraumatic Stress Disorder Checklist – Civilian (PCL-C). The PCL-C (Weathers, Litz, Herman, Huska, & Keane, 1993) is a 17-item measure of posttraumatic stress disorder symptoms corresponding to DSM-IV diagnostic criteria. For each symptom, respondents rated how much the symptom disturbed them during the past month on a five-point Likert-type scale

that ranged from 1 = *not at all* to 5 = *extremely*. Scores on the items were summed to yield a total score that ranges from 17 to 85, with higher scores suggesting more severe symptomology.

The PCL-C contains three subscales that reflect the symptom categories of PTSD identified in the DSM-IV: reexperiencing, avoidance, and arousal. A diagnosis of PTSD is suggested if individuals endorse one or more "reexperiencing" symptoms, three or more "avoidance or numbing" symptoms, and two or more "arousal" symptoms. Weathers et al. (1993) also suggest that total scores of 50 or more suggest a formal diagnosis of PTSD.

The PCL-C has good psychometric properties (Weathers et al., 1993). Scores are stable over a three-day test-rest interval ($r = .96$). The PCL-C also has good internal consistency (alpha $= .97$). The convergent validity of the PCL-C with other PTSD measures is good. Weathers et al. (1993) reported that the PCL-C correlates $r = .93$ with the Mississippi Scale for Combat-Related PTSD, $r = .90$ with the Impact of Events Scale, and $r = .77$ with the PTSD-Keane scale from the MMPI-II. In addition, the PCL-C appears to have adequate diagnostic utility as measured against the Structured Clinical Interview for the DSM-III-R; sensitivity $= .82$, specificity $= .83$, kappa $= .64$ (Weathers et al., 1993). See Appendix C for a copy of the PCL-C.

Penn State Worry Questionnaire (PSWQ). The PSWQ (Meyer, Miller, Metzger, & Borkovec, 1990) consists of 16 self-report items designed to assess the frequency and intensity of worry. Items were obtained from a factor analysis of 161 items in a sample of college students, in which items were deleted if they were ambiguous, redundant, or did not load highly onto a general factor (Meyer et al.). Items were derived from theoretical perspectives on the nature of worry and the authors' clinical experience with clients with generalized anxiety disorder. Items are in the form of statements about the duration and intensity of worry that are rated on a 5-point Likert-type scale reflecting how well each statement describes the

respondent's experiences with worry (1 = *not at all typical of me*, 5 = *very typical of me*). Five items are reverse scored so that scores range from 16 to 80 with higher scores reflecting greater tendencies to worry.

The PSWQ is psychometrically sound. Coefficient alpha ranges from .91 to .95 in five samples of undergraduate students from three different universities (Davey, 1993; Meyer et al., 1990). Test-retest reliability has been found to range from .52 to .93 over 2 to 8 weeks in three different samples of college students (Meyer et al.). Meyer et al. found that scores on the PSWQ are strongly related to scores on measures of psychological constructs meaningfully related to pervasive worry, such as self-esteem (r = -.29), perfectionism (r = .39), time urgency (r = .47), trait anxiety (r = .64), state anxiety (r = .49), and depression (r = .36). Davey's (1993) comparison of three worry questionnaires also demonstrated that the PSWQ correlated significantly with trait anxiety (r = .74) and other worry scales (r = .59-.67) in a sample of undergraduates. Finally, high scores on the PSWQ were shown to predict worry frequency and duration from logs kept by 432 students during the six consecutive days and nights following administration of the PSWQ (Verkuil, Brosschot, & Thayes, 2007). See Appendix D for a copy of the PSWQ.

White Bear Suppression Inventory (WBSI). The WBSI (Wegner & Zanakos, 1994) is a 15-item self-report questionnaire that assesses general thought suppression tendencies, or the deliberate avoidance of unpleasant thoughts. Respondents were instructed to rate on a 5-point Likert-type scale their level of agreement with statements about intrusiveness of thoughts, cognitive avoidance, and persistence of unwanted thoughts (1 = *strongly disagree*, 5 = *strongly agree*). Scores could range from 15 to 75, with higher scores reflecting greater thought suppression tendencies. The WBSI was developed through a series of factor analytic studies in

samples of undergraduates. An item pool of 72 items was reduced to a group of 15 items that loaded onto a single factor accounting for 55% of the rating variance (Wegner & Zanakos). The factor structure of the WBSI has been debated, however, with some researchers finding two factors (e.g., Hoping & de Jong-Meyer, 2003; Rassin, 2003) or three factors (e.g., Blumberg, 2000). Luciano, Belloch, Algarabel, Tomas, Morillo, and Lucero (2006) used a Spanish translation of the WBSI in a sample of 540 undergraduates in Spain to test 6 alternative models and found that none provided a good fit for the data, leading the authors to suggest that the factor structure is unclear.

The WBSI has demonstrated good reliability and validity in several studies. Coefficient alpha has been calculated at .88 (Hoping & de Jong-Meyer, 2003) and .89 (Palm & Strong, 2007; Wegner & Zanakos, 1994). Test-retest reliability was $r = .92$ over a 1-week period (Wegner & Zanakos), $r = .78$ over an interval of 3 to 6 weeks (Hoping & de Jong-Meyer), and $r = .69$ at in a study with inter-test intervals ranging from 3 weeks to 3 months (Wegner & Zanakos). Several studies have found significant correlations between WBSI scores and measures of depression, obsessive-compulsive symptoms, pathological worry, and anxiety (Hoping & de Jong-Meyer; Luciano et al., 2006; Palm & Strong; Wegner & Zanakos). See Appendix E for a copy of the WBSI.

Acceptance and Action Questionnaire (AAQ). The AAQ (Hayes et al., 2004) is a 9-item self-report measure of experiential avoidance, or the avoidance of particular private experiences (e.g., emotions, memories, images, bodily sensations). Respondents rated on a 7-point Likert-type scale the degree to which each statement applies to them (1 = *never true*, 7 = *always true*). Higher scores represent greater use of experiential avoidance, with four items reverse-scored. Hayes et al. conducted a series of studies with a total of over 2,400

undergraduates in the development and validation of the measure. Factor analytic studies demonstrate that items load on a single factor, with avoidance items loading positively at one end and acceptance and action items loading negatively on the other (Hayes et al.; Zvolensky & Forsyth, 2002).

Reliability and validity estimates for the AAQ are adequate. Internal consistency as calculated by Cronbach's alpha is .70 (Hayes et al., 2004), and the AAQ demonstrates concurrent validity in its significant positive correlations with scores on measures of anxiety and depression (Hayes et al., 1994; 1996). The AAQ accounts for variance in general psychopathology, depression, and anxiety above and beyond variance accounted for by measures of avoidant coping and self-deceptive positivity (Hayes et al., 2004). See Appendix F for a copy of the AAQ.

Posttraumatic Growth Inventory (PTGI). The PTGI (Tedeschi & Calhoun, 1996) is a 21-item self-report inventory that assesses respondents' perceptions of positive outcomes following traumatic experiences. Respondents rated the degree to which each listed change occurred as a result of their traumatic experience. Items are rated on a 6-point Likert-type scale ranging from 0 = *I did not experience this change* to 5 = *I experienced this change to a very great degree*). All items are scored in the same direction so that higher scores represent greater perception of posttraumatic growth.

Tedeschi and Calhoun (1996) reduced their item pool from 34 items to the current 21 items following results of a principal components analysis in 604 undergraduates that yielded 5 interpretable factors: relating to others (6 items), new possibilities (5 items), personal strength (4 items), spiritual change (2 items), and appreciation of life (3 items). The 5-factor structure was confirmed in a separate sample of 926 adults in a community sample (Taku, Cann, Calhoun, & Tedeschi, 2008).

The PTGI appears to be a reliable instrument. The original study by Tedeschi and Calhoun (1996) yielded a Cronbach's alpha of .90 for the entire scale and alphas from .67 to .85 for the five individual scales. Sheikh and Marotta (2005) reported similar internal consistency reliability coefficients in a sample of 124 individuals who had recently experienced a myocardial infarction and/or coronary artery bypass surgery ($\alpha = .96$ for the total score and .88-.91 for the five scales). Tedeschi and Calhoun reported corrected item-total correlations that ranged from .35 to .63, correlations among factors that ranged from .27 to .52, and correlations of the factors with the total score that ranged from .62 to .83. Sheikh and Marotta reported similar values in their sample of cardiovascular disease patients, with scales correlating moderately to strongly with each other (rs = .40-.82) and strongly with the PTGI total score (rs above .8 for all scales). Sheikh and Marotta also found the PTGI's split-half reliability to be quite good, with a Spearman-Brown coefficient of .92 ($\alpha = .94$ and .91 for the first and second half of the PTGI, respectively). Test-retest reliability in a sample of 28 undergraduates was acceptable ($r = .71$) over a 2-month interval (Tedeschi & Calhoun).

There is also evidence to support the convergent and discriminant validity of the PTGI. Tedeschi and Calhoun (1996) reported that it correlates positively with optimism, religiosity, and personality factors of openness, agreeableness, and extraversion and does not correlate significantly with a measure of social desirability. Tedeschi and Calhoun presented evidence of construct validity as well. There was a significantly greater degree of benefits perceived by persons who experienced traumatic events than by persons who experienced less severe events. This result led the authors to suggest that perception of benefits is not illusory, because, if PTGI scores were simply a function of positivity bias, then there should be no relationship between severity of trauma and degree of benefits reported. See Appendix G for a copy of the PTGI.

Posttraumatic Cognitions Inventory (PTCI). The PTCI (Foa et al., 1999) is a 36-item self-report questionnaire that assesses trauma-related thoughts and beliefs. Items are rated on a 7-point Likert-type scale (1 = *totally disagree*, 7 = *totally agree*). Scores could range from 36 to 252, with higher scores representing more negative posttraumatic cognitions.

The PTCI was originally developed as an adaptation of another commonly used measure, the World Assumptions Scale (WAS; Janoff-Bulman, 1989). The PTCI was developed to assess cognitions associated with PTSD rather than cognitions associated with trauma exposure in general. Both the PTCI and the WAS assess cognitions related to the world, other people, and self. Although the WAS is a well established measure, the PTCI was selected for use in the current study because scoring of the PTCI is more explicit, the psychometrics are stronger (Foa et al., 1999), and the PTCI has been found to predict PTSD severity better than the WAS. Also, the majority of recent studies utilize the PTCI instead of the WAS (e.g., Moser et al., 2007; O'Donnell et al., 2007).

A principal-components analysis in a sample of 601 adults (110 patients with PTSD, 190 community volunteers, and 300 undergraduates; Foa et al., 1999) yielded a 3-factor structure of negative cognitions about self (21 items), negative cognitions about the world (7 items), and self-blame (5 items). Three of the items on the scale are included in the total score but are not included in the subscales, based on Foa et al.'s note that these items are experimental and were added after the factor structure had been determined. Foa et al. reported high internal consistency coefficients for the scales: Cronbach's α = .97 for negative cognitions about self, .88 for negative cognitions about the world, .86 for self-blame, and .97 for the total score. Subscale test-retest reliabilities ranged from .75 to .89 over a one-week interval and from .80 to .86 over a three-week interval (Foa et al.).

Foa et al. (1999) reported that convergent validity was supported by the scale's significant correlations with other measures of trauma-related cognitions (rs = .20 to .74 for the various subscales), PTSD severity (r = .79), depression (r = .75), and general anxiety (rs = .70 to .75). Foa et al. reported that the scale discriminated among persons with PTSD, persons who experienced trauma without PTSD, and nontraumatized persons and that these differences were not attributable to differences in depression or anxiety. Finally, a discriminant function analysis revealed that the PTCI classified 86% of 355 traumatized individuals correctly into those with and without PTSD. See Appendix H for a copy of the PTCI.

Dispositional Resilience Index (DRI). The DRI (Bartone et al., 1989) is a 30-item short-form self-report questionnaire that represents a modified version of Kobasa's (1979) measure of personality hardiness. Items are rated on a 4-point Likert-type scale according to how much respondents agree with statements about perspectives on work, approaches to problem-solving, and sense of control over life circumstances (0 = *not true at all*, 3 = *completely true*). Half of the items are reverse-scored so that higher scores represent greater hardiness. Bartone's version of the hardiness scale corrects problems found in Kobasa's hardiness scale, such as long and awkward sentences and unidirectional scoring of items, which may lend itself to response bias (Funk & Houston, 1987).

Consistent with Kobasa's (1979) conceptualization of hardiness, the DRI has three 10-item subscales of commitment (i.e., perception of stress as meaningful), control (i.e., perception of stressors as changeable), and challenge (i.e., perception of changes as challenges rather than threats). The division of the measure into scales was supported in principal component factor analyses in samples of 787 bus drivers and 111 army officers and showed adequate reliability,

with Cronbach's alphas of .82 for the whole short-version scale and .62 to .82 for the three

subscales (Bartone et al., 1989).

Although there are currently no studies assessing the validity of the DRI, numerous

studies have confirmed the validity of Kobasa's (1979) measure of hardiness on which Bartone's

(1989) measure was based. For example, hardiness was negatively associated with depression,

shyness, social anxiety, public self-consciousness, and personal distress and positively associated

with optimism, self-esteem, and sociability in several samples of undergraduates (Hull, Van

Treuren, & Virnelli, 1987). Discriminant validity was evidenced in the lack of significant

correlation with measures of constructs theorized to be distinct from hardiness, such as sense of

humor, achievement test scores, empathy, perspective taking, and Type A personality

characteristics (Hull et al., 1987). See Appendix I for a copy of the DRI.

Self-efficacy Scale (SES). The SES (Sherer, Maddux, Mercandante, Prentice-Dunn,

Jacobs, & Rogers, 1982) is a 23-item self-report scale that assesses general expectations of

success. Participants rated items on a 14-point Likert scale according to how much they agree

with each statement (1 = *strongly disagree, 14 = strongly agree)*. Fourteen items are reverse-

scored to prevent response bias, and higher scores reflect greater perceived self-efficacy. It

differs from the Coping Self-efficacy scale in its focus on general success expectancies in social

skills and vocational competence rather than expectancies about one's ability to cope with

challenges and threats. An exploratory factor analysis during the scale's construction revealed

two factors representing general self-efficacy and social self-efficacy, and this factor structure

was supported in a confirmatory factor analysis in a second sample of undergraduate students

(Sherer et al.).

The psychometric properties of the SES appear to be sound. Both subscales have

adequate internal consistency reliability (Cronbach's α = .86 for the general self-efficacy

subscale and .71 for the social self-efficacy subscale; Sherer et al., 1982). Sherer et al. assessed

the construct validity of the SES and reported that SES scores correlated significantly with

measures of locus of control (*r* = -.29, representing an internal locus), social desirability (*r* =

.43), ego strength (*r* = .29), interpersonal competence (*r* = .45), and self-esteem (*r* = -.51, with

low scores on the self-esteem scale representing higher self-esteem). They also reported that the

scale predicted successful outcomes in a sample of 150 inpatients veterans who were undergoing

treatment for alcoholism. Scores on the SES were significantly positively correlated vocational

success (established through employment status, number of jobs quit, and number of times fired),

highest educational level completed, and highest military ranking earned. Further evidence of the

construct validity of the SES was reported in Sherer and Adam's (1983) study of 101

undergraduates. They found that high scorers on the general self-efficacy subscale exhibited

better adjustment as evidenced by higher scores on a measure of assertiveness and lower scores

on measures of depression, anxiety, and introversion. See Appendix J for a copy of the SES.

Coping Self-efficacy Scale (CSE). The CSE (Chesney et al., 2006) is a 26-item self-

report measure of perceived self-efficacy in coping with challenges and threats. Respondents

were asked to rate their confidence in engaging in 26 coping behaviors. Confidence in engaging

in each behavior was assessed on an 11-point Likert-type scale (0 = *cannot do at all*, 10 =

certainly can do). Items were derived from stress and coping theory, a coping questionnaire, and

consultation with Dr. Albert Bandura of Stanford University (Chesney et al.). Items were piloted

and selected for face validity in a sample of HIV-infected patients, and then an exploratory factor

analysis was conducted in a different sample of HIV-infected participants that yielded three

factors: problem-focused coping (12 items), emotion-focused coping (9 items), and social

support (5 items; Chesney et al.).

The CSE appears to have sufficient reliability and validity as a measure of perceived

coping efficacy, but, as a relatively new measure, limited psychometric data are available.

Chesney et al. (2006) reported that internal consistency estimates (Cronbach's alpha) ranged

from .8 for the social support scale to .91 for the other two scales (problem- and emotion-focused

coping). In this study, test-retest correlations ranged from .4 to .8 over a 12-month period, with

lowest test-retest correlations obtained between baseline and 12-months. They also reported

concurrent validity in the form of significant correlations in the predicted directions between the

CSE and measures of psychological distress and well-being, coping styles, and social support.

Finally, Chesney et al. reported that changes in coping self-efficacy, especially in regard to the

use of problem- and emotion-focused behaviors, predicted changes in psychological distress and

well-being over a 12-month period in HIV-infected men in therapy for depressed mood. See

Appendix K for a copy of the CSE.

Anxiety Control Questionnaire (ACQ). The ACQ (Rapee, Craske, Brown, & Barlow,

1996) is a 30-item self-report instrument that assesses perceived control over anxiety-provoking

events. Items are ranked on a six-point Likert-type scale (0 = *strongly disagree*, 5 = *strongly

agree*) according to the degree participants agree with each statement (e.g., "I can usually stop

my anxiety from showing"). Eighteen items are reverse-scored so that higher scores represent

greater perceived control. Although factor analyses in two samples (anxiety disorder patients and

undergraduates) indicated that the ACQ is composed of two factors (i.e., control over external

events and control over internal emotional reactions; Rapee et al.), ACQ total scores are typically

used as a global index of perceived control over threatening events (e.g., Feldner & Hekmat, 2001; Rapee et al.).

Rapee et al. (1996) reported that the Cronbach's alpha for the overall scale was .87 in a sample of 250 persons receiving outpatient treatment for a DSM-III-R anxiety disorder, with an alpha of .83 for the external events subscale and .80 for the internal emotional reactions subscale. Similar results were found in a sample of 236 undergraduates (total scale $\alpha = .89$, events $\alpha = .82$, reactions $\alpha = .84$; Rapee et al.). Test-retest correlations in undergraduates students were .88 over a 1-week interval and .82 over one month (Rapee et al.).

Rapee et al. (1996) also report that the ACQ demonstrates good convergent and discriminant validity. The ACQ showed significant, moderate, negative correlations with measures of anxiety and significant, moderate correlations with other measures of control. However, the ACQ correlated more strongly with measures of anxiety than did more global measures of control. Anxiety disorder patients scored significantly lower on the ACQ than did undergraduates, whereas a sample of men diagnosed with erectile disorder scored higher than anxiety disorder patients, which suggests that the ACQ is not simply assessing aspects of general distress. Finally, there is evidence that the ACQ is sensitive to changes during therapy, as the mean score for 19 persons who received cognitive behavioral therapy for panic disorder with agoraphobia increased from 63.7 to 93.3 after the 12-week treatment (Rapee et al.). See Appendix L for a copy of the ACQ.

Procedure

Recruitment took place during regularly scheduled class times. During recruitment, a brief summary of the research project was presented, which included the purpose of the study, the amount of extra credit to be earned, the anticipated time commitment for participation (45-60

minutes), and the time and location of the study. The students were told that all responses were confidential and that they could discontinue participation at any time without penalty. Refer to Appendix M for the Informed Consent Form and Appendix N for the Informed Consent Script that details the information that was presented.

Data collection involved group administration of the questionnaire packet. At the beginning of each session, the principal investigator or a research assistant explained the nature of the participation. Students were again told that they were being asked to participate in one session during which they would complete a questionnaire packet assessing stressful or traumatic life events, their responses to those events, and their beliefs about themselves and others. The participants were reminded that all responses are confidential and that they were free to discontinue at any time without penalty. They were asked to provide contact information if they would like to receive a summary of the findings when the study is complete.

After the general nature of the session was explained, the principal investigator or research assistant verbally summarized the informed consent form. Participants were asked to review and endorse the consent form and, upon agreement to participate, were given a copy of the consent form to retain for their own records. The form included the name of the primary investigator, the name and contact information of the dissertation advisor, and information about resources (i.e., counseling services) available to them if they would like to discuss their response to their research participation. The participants completed a brief demographics questionnaire, a life events questionnaire (TEQ: Vrana & Lauterbach, 1994), and a measure to assess the impact of traumatic life events (PCL-C: Weathers et al., 1993). They also completed a series of brief scales that assessed cognitive factors hypothesized to be risk or resilience factors following trauma exposure. These measures assessed worry (PSWQ: Meyer et al., 1990), the use of thought

suppression (WBSI: Wegner & Zanakos, 1994), experiential avoidance (AAQ: Hayes et al., 2004), coping self-efficacy (CSE: Chesney et al., 2006), general self-efficacy (SES: Sherer et al., 1982), hardiness (DRI: Bartone et al., 1989), posttraumatic growth (PTGI: Tedeschi & Calhoun, 1996), posttraumatic cognitions (PTCI: Foa et al., 1999), and perceived control over anxiety (ACQ: Rapee et al., 1996). Instructions for completing all instruments were presented verbally to participants prior to completion, and participants were encouraged to ask for clarification of any instructions or items.

The first five instruments were presented in a fixed order to all participants. All participants completed the TEQ prior to receiving the rest of the questionnaires. This was done to ensure that the instructions were given close in time to completion of the TEQ and so that researcher assistants could individually verify that participants endorsed a worst event before they were given the rest of the questionnaires. All questionnaire packets began with (1) the demographics questionnaire, (2) the TEQ (3) the PCL-C, (4) the PTCI, and (5) the PTGI. The PCL-C, the PTCI, and the PTGI were intended to be completed while participants are thinking about the event they listed on the TEQ, so it was necessary for the TEQ to precede these instruments. These questionnaires were administered first to reduce the possibility of missing data on the TEQ and PCL-C, the two most important measures in the study in terms of providing variables for subsequent analyses. Additionally, items on the demographics questionnaire, in concert with other measures, were used to impute missing values in the event that patterns of missing data were observed. Participants were instructed to begin answering "in general" and not in specific reference to their selected event once they start the sixth questionnaire.

The final seven questionnaires were administered in two randomly-generated sequences: (1) DRI, SES, ACQ, CSES, WBSI, AAQ, and PSWQ; and (2) PSWQ, DRI, SES, ACQ, AAQ,

CSES, and WBSI. The sequence was not expected to affect the outcome of the data, but varying the sequence would minimize the possibility of a systematic bias in the data due to fatigue. The sequence was coded and examined for possible order effects. It was anticipated that there would be no order effects and that all analyses would collapse across the two groups. Independent samples t-tests were used to compare the two order conditions on each of the seven measures. A significance level of .01 was selected to reduce Type 1 error. Groups differed on only the SES [$t(421)$=-2.8, $p<.01$]. Persons who completed the second sequence had significantly higher scores on the SES (M=229.3, SD=40.8) than did persons who completed the first sequence (M=217.6, SD=45.2). When regression analyses were run separately for each sequence, SES scores emerged as a significant predictor of PTSD severity among persons who completed Sequence 1 and not among persons who completed Sequence 2. The implications of this finding will be reviewed in the discussion section of this paper.

To minimize missing data, when participants turned in their completed packets, questionnaires were checked for omissions or unclear answers. Clarification of answers, if necessary, was established before the participant left. Participants were encouraged to review the TEQ carefully, and instructions were read aloud to participants prior to completion. When participants completed the TEQ, they were asked to bring their completed questionnaire to a research assistant. The research assistant verified that participants correctly completed the TEQ and distributed the remainder of the packet. This verification was important because several questionnaires required that participants correctly complete the TEQ and clearly identify a single worst event.

Because data collection occurred over the course of two semesters, it was important to ensure that participants did not submit data more than once. Consequently, each participant was

asked to write a code on his or her questionnaires. This code was their two-digit day of birth (e.g., 08), the last two digits of their home street address, followed by the last two digits of their phone number. Questionnaire packets were then examined to ensure that there were no duplicate codes. If a duplicate code occurred, the answer sheet corresponding to the later test period would have been discarded; however, there were no duplicates. Several participants began testing sessions but then left before completing any measures after stating that they had already completed the study.

Independent Variables

Independent variables fell roughly into three categories: event characteristics, person variables, and cognitive factors. Event characteristics were obtained from the TEQ, person variables from the demographics questionnaire and TEQ, and cognitive factors from a number of individual instruments.

Event characteristics obtained from the TEQ that were analyzed as predictors of PTSD symptom severity included type of event (interpersonal or not interpersonal), degree of perceived threat, event duration, degree of injury, perception of support related to the event, and, for interpersonal events, relationship to offender. Event type was coded 0 for reported worst events that are not of an interpersonal nature (i.e., do not have a clearly identified "perpetrator") and 1 for interpersonal events. Perceived threat was taken from the TEQ item addressing life threat for worst event. Scores could range from 1 *not at all* to 7, to *extremely*. Event duration was coded 1 for a single occurrence of a person's worst event, 2 for multiple discrete occurrences of a person's worst event, 3 for ongoing events that lasted less than one year, and 4 for ongoing worst events that were reported to have lasted for a year or longer. Degree of injury was ascertained from the TEQ item addressing extent of injury (rated 1 to 7) for the identified worst events.

Received support was obtained from the TEQ ratings for support at the time of the event and for current support (rated 1 to 7). For events with a clear perpetrator (i.e., interpersonal events), closeness to offender was obtained from the TEQ rating for emotional closeness to offender prior to the event (rated 1 to 7). Categories of relationships were also assessed for each TEQ item that involves a perpetrator, so follow-up analyses were conducted to determine which relationships are most strongly associated with PTSD symptoms.

Person variables that were obtained from the demographics questionnaire included sex, age, and socioeconomic status of family-of-origin. Sex was coded 0 for males and 1 for females. Age was entered as reported. Socioeconomic status was entered as two separate variables: annual income and relative wealth as perceived by the respondent. Income was entered as a score ranging from 1 (less than $10,000) to 7 (greater than $150,000) depending on which categories were endorsed. Perception of wealth was obtained from the item instructing participants to endorse the statement that best describes their family's economic status rated from 1 (*we had barely enough to get by*) to 5 (*we had plenty of luxuries*). The final person variable that was included as a predictor in analyses was trauma history. This was obtained by summing the number of discrete traumas identified on the TEQ.

Cognitive factors that were entered as independent variables in analyses were derived from summed scores on the measures that assessed each variable. Variables included worry (PSWQ total), thought suppression (WBSI total), experiential avoidance (AAQ total), coping self-efficacy (CSE total), self-efficacy (SES total), hardiness (DRI total), perception of benefit (PTGI total), posttraumatic cognitions (PTCI total), and perceived control over anxiety-provoking events (ACQ total).

Subscale scores for self-efficacy, hardiness, perception of benefit, and posttraumatic cognitions were also calculated. The self-efficacy subscales was created as suggested by Sherer et al. (1982) by obtaining the mean on the SES for the general self-efficacy subscale (items 1-17) and the social self-efficacy subscale (items 18-23). The three hardiness scales on the DRI were obtained by using the total scores on each of the three components: commitment (items 1, 6-7, 11, 16-17, 22, 27-28, 30), control (items 2-3, 8-9, 12, 15, 18, 20, 25, 29), and challenge (items 4-5, 10, 13-14, 19, 21, 23-24, 26). Because each subscale has the same number of items, Bartone et al. (1989) suggest using totals instead of means. The PTGI's five scales of perceived benefit was obtained by calculating the mean for the set of items in each subscale: relating to others (items 6, 8-9, 15-16, 20-21), new possibilities (items 3, 7, 11, 14, 17), personal strength (items 4, 10, 12, 19), spiritual change (items 5, 18), and appreciation of life (items 1-2, 13). The PTCI's three scales of posttraumatic cognitions were used to calculate a mean for each set of items: negative cognitions about self (items 2-6, 9, 12, 14, 16-17, 20-21, 24-26, 28-30, 33, 35-36), negative cognitions about the world (items 7-8, 10-11, 18, 23, 27), and self-blame (items 1, 15, 19, 22, 31).

Retrospective reports of peritraumatic feelings of fear, helplessness, horror, anger, shock, and shame also constituted predictors in several analyses. Scores were obtained from items added to the TEQ items that instructed participants to rate these emotions on a 7-point Likert-type scale.

Participants' data were coded for fulfillment of criterion A. Events were considered to qualify for criterion A1 if they were listed in Breslau and Kessler's (2001) list of 19 qualifying events (Appendix O) and for A2 if values of 5, 6, or 7 on the Likert-type scale of any of the TEQ items assessing responses of fear, helplessness, or horror were endorsed. Events that did not

clearly meet criterion A1 (i.e., events not listed in Breslau and Kessler's list of events) were evaluated by two independent judges for the degree the event coincided with the DSM-IV's description of criterion A1. In the case of disagreement, a third person would have been consulted, and the judges would have discussed the matter until an agreement was reached. There was no disagreement on any item, however. Events that did not meet both components of criterion A were coded as non-qualifying events for subsequent analyses.

Dependent Variable

The dependent variable was PTSD scores on the PCL-C. Ratings for each item were summed to provide an overall index of posttraumatic stress symptom severity.

Data Analyses

Prior to performing the correlation and regression analyses, the data were screened for adherence to the statistical assumptions required by multiple regression and factor analysis. The data were screened for missing values, outliers, normality, linearity, and homoscedasticity, and tested for multicollinearity for multiple regression analyses (Tabachnick & Fidell, 2001), and PCL-C scores were screened for missing values, outliers, normality, and linearity according to the assumptions required by factor analysis (Mertler & Vannatta, 2005).

After ensuring that data were entered correctly by inspecting the descriptive statistics for each variable, the data were screened for missing values. Five participants neglected to turn in the Demographics Questionnaire, and 29 participants failed to answer the three items on the back of the Demographics Questionnaire. One person did not complete the AAQ or PSWQ due to time constraints. Finally, a few items were left blank on some of the other measures (i.e., three missing values on each of three items on the PTCI, three missing values on one item of the DRI and two missing values on a second item, one missing value on each of two items on the SES

and CSES and on each of three items on the ACQ, two missing values on one item on the AAQ, and one missing value on the PSWQ). There were no missing values on the TEQ, PCL-C, PTGI, and WBSI. Patterns of missing data were identified using the SPSS missing value analysis module.

Three patterns of missingness were possible, two of which can be addressed through statistical techniques (West, 2001). Values missing completely at random (MCAR) are values that are not correlated with other variables. For example, if a copying error results in the deletion of several items on a portion of the questionnaire packets, these data would be missing completely at random. In this example, missingness is not related to any subject characteristics. For values missing at random (MAR), missingness is not related to the variable being assessed but is related to other measured variables. For example, if depressed persons are more likely than nondepressed persons to omit information about their income, the missing data do relate to another variable (depression). If an analysis is conducted only with depressed participants, however, and the resulting analysis reveals that the probability of reporting income is unrelated to level of income, the data can be treated as if it is missing at random. Finally, for data that are missing not at random (MNAR), missingness is related to the dependent variable. If persons with low income consistently omit the item assessing income, then missingness would be classified as MNAR. Values that are missing completely at random or missing at random can be imputed using statistical techniques.

The SPSS missing value analysis module was used to identify patterns of missingness, which were categorized by the analyses as missing completely at random or missing at random (see Table 2). Pairwise deletion, casewise deletion, and mean substitution have been criticized for distorting correlations by minimizing variance, so alternative methods of addressing missing

Table 2

Treatment of Missing Data

Variable	# of Subjects	Description	Mechanism	Level
Sex	2	Demographics Questionnaire not collected by assistant, sex could not be determined by other answers	MCAR	Nominal
Age	5	Demographics Questionnaire not collected by assistant	MCAR	Ratio
Income	5	Demographics Questionnaire not collected by assistant	MCAR	Interval
Economic situation	38	Demographics Questionnaire not collected by assistant (5), Participant did not turn paper over to answer questions (33)	MCAR (5)/MAR (33)	Interval
PTCI items 20-22	3	Participant skipped items	MAR	Interval
DRI item 5	3	Participant skipped items	MAR	Interval
DRI item 21	2	Participant skipped items	MAR	Interval
SES items 14, 21	1	Participant skipped items	MAR	Interval
ACQ items 4, 12, 27	1	Participant skipped items	MAR	Interval
CSES item 1	1	Participant skipped items	MAR	Interval
AAQ items 1-5, 7-9	1	Participant skipped items	MAR	Interval
AAQ item 6	3	Participant skipped items	MAR	Interval
PSWQ items 1-15	1	Participant skipped items	MAR	Interval
PSWQ item 16	2	Participant skipped items	MAR	Interval

data, such as maximum likelihood, Bayesian multiple imputation, and regression techniques are recommended (e.g., Schafer & Graham, 2002; Sinharay, Stern, & Russell, 2001). Regression estimates of missing values were obtained using the SPSS missing value analysis module. SPSS was used to compute multiple linear regression estimates that were augmented with random

components, or a residual from a randomly selected case. This procedure was used to impute missing values. Sex could not be imputed with this method for the two persons missing values on this variable, so these two participants were dropped from the regression analyses with sex entered as a predictor.

The only exception to this imputation of missing values applied to the TEQ item addressing a person's worst event. If a person did not indicate a worst event, their responses on the PCL-C, the PTGI, and the PTCI could not be interpreted, because these instruments require individuals to consider their worst event in their responses to these measures. If participants did not indicate a worst event on the modified TEQ, they were dropped from *all* analyses. Data from three participants were dropped from the study for this reason, resulting in a final sample size of 423.

After the data were screened for missing values, scores on each independent variable were graphed on a scatterplot individually and in combination with the dependent variable to check for univariate outliers, normality, linearity, and homoscedasticity. Calculating Mahalanobis distances and testing outliers for Mahalanobis chi-square significance were used to identify multivariate outliers. Only one case was identified as an extreme[3] multivariate outlier, and most measures contained one or two univariate outliers. Analyses were run both with and without the univariate outliers and the case that was identified as a multivariate outlier. There were no discrepancies in the results of these analyses; therefore, results are reported for the original data with outliers retained. Preliminary screening showed moderate departures from normality, linearity, and/or homoscedasticity for the majority of measures, so scores were transformed by taking the square roots of each score, as suggested by Tabachnick and Fidell

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[3] Mertler and Vannatta (2000) define "extreme" outliers as Mahalanobis chi-square values exceeding the critical value at $p < .001$.

(2001). All analyses were run on the original scores and the transformed scores. Because there were no discrepancies in results, all analyses reported in this paper use the original scores for ease of interpretation.

The data were also tested for multicollinearity by calculating the tolerance $(1 -$ squared multiple correlation) of each combination of independent variables. In the event of multicollinearity, separate regression analyses would have been performed for the independent variables that were too highly correlated. SPSS automatically assessed for collinearity when the regression analysis was performed and would have dropped variables that correlated too highly with other independent variables. No problems with multicollinearity were identified.

The first two hypotheses relating to predictors of PTSD symptom severity for criterion A events (i.e., the first hypothesis) and events that do not meet criterion A (i.e., the second hypothesis) were addressed using hierarchical multiple regression. Because there is much variability in the development of PTSD symptoms following trauma exposure, person variables were expected to contribute to PTSD symptom severity above and beyond variability that could be accounted for by event characteristics. To that effect, event characteristics were entered first, followed by person variables and then cognitive factors. Two separate but identical regression analyses were conducted for traumas that met criterion A and for those with stressful experiences that did not meet criterion A. Variables that were entered into block 1 included event type dummy coded (i.e., interpersonal or not interpersonal), degree of perceived threat, event duration, degree of injury, support at the time of the event, and current support. Block 2 consisted of sex, the two items from the demographics questionnaire assessing socioeconomic status, number of previous traumas, and age. Block 3 consisted of scores on cognitive factors related to avoidance (i.e., scores on the PSWQ, WBSI, and AAQ), inconsistent beliefs (i.e.,

scores on the PTGI and PTCI), and helplessness (i.e., scores on the DRI, SES, CSE, and ACQ). This order of entry represents a rigorous test of the hypothesis that cognitive variables are significant predictors of PTSD symptoms. Consequently, block order was varied to determine the effect of changing the order.

Subscales of measures that were significant predictors of PTSD symptom severity were additionally examined for their contribution to PTSD symptom severity. Hierarchical multiple regression analyses were rerun in the manner outlined above, but total scores were replaced with mean or total subscale scores (i.e., mean scores for measures with subscales of varying length and total subscale scores for measures with subscales of identical length) for the instruments that were significant predictors of PCL-C scores. Of interest in these analyses were the beta weights associated with each subscale in order to examine the individual contribution of the subscales above and beyond the other variables in the equation.

Two additional hierarchical multiple regression analyses were performed on only events that qualified as interpersonal events on the TEQ. Variables were entered into the equation in the same manner as above; however, "event type" was replaced with "emotional closeness to offender" to assess the influence of this variable in predicting PTSD symptom severity relative to the influence of the other event and person characteristics examined in this study. In these analyses, the statistic of interest was the individual beta weight of the variable "relationship with offender" in both analyses (i.e., with events that meet criterion A and with events that do not meet criterion A). For persons who indicated rape as their worst event, a one-way ANOVA was used to compare PTSD symptom means for each category of relationship to offender.

The third hypothesis that cognitive variables will mediate the relationship between experiencing a trauma and PTSD symptoms was tested through a series of multiple regression

analyses as outlined by Baron and Kenny's (1986) paper on the moderator-mediator distinction. Scores on each measure of cognitive factors were tested for a mediator role by conducting the following analyses: first, regressing the cognitive variable onto trauma exposure; second, regressing PTSD symptoms onto trauma exposure; and third, regressing PTSD symptoms on both trauma exposure and scores on the cognitive measure. At each point, if the model became non-significant, no further analyses were run, because the data did not support the mediator hypothesis. Assuming all analyses were significant, a cognitive variable was deemed a mediator if the final analysis in the series described indicated a decrease in the predictive value of trauma exposure when scores on the cognitive variable were also included in the model (i.e., predictive value of trauma exposure is lower in the third analysis than in the second).

The fourth hypothesis, which related to the predictive capacity of retrospective reports of peritraumatic feelings of anger, shock, or shame, was addressed with two simultaneous multiple regression analyses, one for events that met criterion A1 and one for events that did not meet criterion A1. They included the following predictors from the TEQ ratings for participants' identified worst events: fear, helplessness, horror, anger, shock, and shame. The dependent variable was PCL-C scores. To avoid a restricted range of scores in the "criterion A-present" analysis, participants' responses were included in this analysis if criterion A1 was satisfied regardless of whether criterion A2 was satisfied. Although participants in this case may not technically qualify for satisfaction of criterion A (i.e., if they report low feelings of fear, helplessness, or horror), of interest in this analysis was the ability of criterion A2 and related peritraumatic feelings to predict PTSD symptom severity. Follow-up analyses were conducted to examine each combination of significant predictors (e.g., fear and helplessness, horror and fear, etc.) for its ability to predict PTSD symptom severity.

Confirmatory factor analysis (CFA) procedures were used to test the fifth hypothesis, that a 4-factor model of reexperiencing, arousal, avoidance, and either dysphoria or numbing would fit the data. Two separate CFAs were conducted for each of the three measurement models being tested: one for participants whose worst event satisfied criterion A and another for participants whose worst event did not satisfy criterion A. Analysis of Moment Structures (AMOS) was used to conduct the CFAs. Maximum likelihood estimation procedures were used to analyze covariance matrices of the 17 PCL-C items. Three models were tested: the King et al. (1998) four-factor intercorrelated numbing model, the DSM-IV intercorrelated three-factor model, and Simms et al.'s (2002) four-factor dysphoria model. Indices of fit that were examined for each model included the goodness of fit index (GFI), the adjusted goodness of fit index (AGFI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (RMR). GFI and AGFI values greater than .85 and .80, respectively, denote good fit, but values above .90 are preferred (Marsh, Balla, & McDonald, 1988). RMSEA and RMR values less than .05 represent good fit, values of .05 to .08 represent moderate fit, and values of .08 to .10 represent adequate fit (Brown & Cudeck, 1993). Chi-square values were used to compare the three models.

The best-fitting model was tested for invariance between the criterion A group and the non-criterion A group. The groups were compared using a multiple-group analysis in which successively more stringent constraints on equivalence were imposed on the data to examine the extent of fit degradation with increasingly stringent constraints. Configural invariance would be supported by a well-fitting model that has the same *number* of factors and pattern of loadings, covariances, and residuals, whereas metric invariance is supported if equality constraints on the *loadings* for each factor yield acceptable fit (McArdle, 2007).

Results

Sample Characteristics

The final sample consisted of 423 college students enrolled in psychology courses at Eastern Michigan University during Winter or Spring terms of 2009. All volunteered to participate in this study for extra credit in a psychology course. Participants ranged in age from 18 to 60 years ($M = 20.8$, $SD = 4.7$). Sixty-nine percent ($n = 292$) were women and 30.5 percent ($n = 129$) were men. Two participants did not report their sex. The majority of the respondents identified themselves as European American (63.8%, $n = 270$). One hundred five (24.8%) identified themselves as African American, 17 (4.0%) as Hispanic, 11 (2.6%) as Asian, 7 (1.7%) as Native American, 4 (0.9%) as Arab American, 3 as Indian (0.7%), and 1 (0.2%) as Pacific Islander. Five participants did not report their racial or ethnic affiliation. Table 3 lists additional demographic features of this sample.

The original sample consisted of 426 participants, but three participants were excluded from all analyses because they did not indicate a worst event on the TEQ. Of the 423 retained participants, 377 completed all measures. Missing values for the 46 participants with missing values were imputed using the missing value analysis module of SPSS, as described in the Data Analyses section of this paper.

Event Characteristics

Participants' reported worst events were examined for their fulfillment of criterion A for PTSD based on the methodology outlined earlier in this paper. Out of 423 participants, 220 reported a worst event that fulfilled criterion A, and 203 reported a worst event that did not fulfill criterion A. For those that did not fulfill criterion A, the majority (187) reported a worst event that did not meet criterion A1 (i.e., threat to life or physical integrity). Sixteen participants

Table 3

Descriptive Statistics for Sample

	Percent	*n*
Class Standing		
Freshman	40.2	170
Sophomores	20.8	88
Juniors	15.1	64
Seniors	14.2	60
Second Degree	1.7	7
Did Not Answer	8.0	34
Past Therapy Appointments		
None	58.4	247
One to Five	15.8	67
Six to Ten	5.4	23
Eleven to Twenty	3.8	16
More Than Twenty	8.5	36
Did Not Answer	8.0	34
Relationship Status		
Single	84.9	359
Married	4.3	18
Divorced/Separated	2.1	9
Living with Partner	7.5	32
Did Not Answer	1.2	5

reported an event that satisfied criterion A1 (e.g., unexpected death of someone close, child abuse, life endangered), but their ratings of their fear, helplessness, or horror did not meet criterion A2. Of those that met criterion A, the most commonly reported worst events were the unexpected death of someone close to the participant (31.4%), being in serious danger (23.2%), child abuse (12.7%), and serious accidents (11.8%). Worst events that did not meet criterion A were varied, but the most commonly reported worst events were death of a grandparent (18.7%), romantic break-up (12.8%), parental discord (9.4%), legal problems (7.4%), peer conflict (7.4%), getting into a minor accident (5.9%), and financial problems (5.4%). Table 4 lists events according to their prevalence as reported worst events in this sample.

Peritraumatic emotional reactions that were retrospectively assessed included fear, helplessness, horror, anger, shock, and shame. All were assessed on a scale of 1 to 7, with higher ratings signifying higher levels of the emotion. Helplessness had the highest average rating ($M =$ 5.9, $SD = 1.6$), followed by fear ($M = 5.5$, $SD = 1.8$), shock ($M = 5.4$, $SD = 1.9$), anger ($M = 4.9$, $SD = 2.1$), horror ($M = 4.8$, $SD = 2.0$), and shame ($M = 3.7$, $SD = 2.4$).

Event characteristics included in analyses were type (i.e., interpersonal, non-interpersonal), relationship to offender for interpersonal events, degree of perceived threat and injury, event duration, and perception of support. Approximately two-thirds of the sample (63.1%) reported a worst event that was interpersonal, involving at least one other person in a direct way (e.g., assault, abuse, death of a loved one, conflict with peers, etc.); the other third of the sample (36.9%) reported a worst event that was not inherently interpersonal (e.g., natural disaster, accident, financial problems, etc.). For interpersonal worst events, the mean rating of emotional closeness to the other party involved was 4.2 out of 7 ($SD = 2.0$). Participants reported a mean rating of 2.8 ($SD = 2.2$) out of 7 on the degree of life threat experienced and 2.0 ($SD =$

Table 4

Frequency of Worst Events Reported

Worst Event	Percent	*n*
Criterion A Present		
Received news of injury or death to someone close	31.4	69
Life endangered	23.2	51
Child abuse	12.7	28
Serious accident or fire	11.8	26
Sexual Assault	6.8	15
Witnessed serious injury or death	5.0	11
Victim of non-sexual violent crime	4.1	9
Abusive relationship	4.1	9
Natural Disaster	0.9	2
Criterion A Absent		
Death of a grandparent	18.7	38
Romantic break-up	12.8	26
Parent discord/divorce	9.4	19
Legal problems	7.4	15
Peer conflict	7.4	15
Minor accident	5.9	12
Financial problems	5.4	11
Illness in family	4.4	9
Moving	4.4	9
Other	24.2	49

1.7) on the degree of injury experienced. Of the 423 participants, 274 reported a discrete worst event that occurred once (e.g., single car accident), 107 reported a discrete worst event that occurred multiple times (e.g., assaulted twice), 16 reported a chronic event that occurred for less than one year (e.g., abusive relationship that lasted six months), and 26 reported a chronic event that occurred for longer than one year (e.g., childhood abuse that lasted two years). Participants endorsed a relatively high level of perceived support at the time of the event (mean rating = 4.8 out of 7, $SD = 2.1$) and less support related to the event at the time of the study (mean rating = 3.3, $SD = 2.2$).

Person Variables

Person variables included in the analyses were sex, age, socioeconomic status, and trauma history. As indicated previously, approximately two thirds of the sample was female ($n = 292$) and one third male ($n = 129$). Two participants did not indicate their sex. Participants ranged in age from 18 to 60 ($M = 20.8$, $SD = 4.7$). The majority (89%) were between 18 and 23. Family of origin income distribution can be found in Table 5. The modal response to the qualitative description of income was "solidly middle class," and the majority of participants reported that their family income ranged from $25,000 to $99,999.

Participants reported a high level of trauma exposure. The reported number of traumas experienced by individual participants ranged from 1 to 8 events with a mean of 2.4 ($SD = 1.3$). When the TEQ was administered, participants were instructed to write in a "worst event" if they had not experienced a trauma previously listed, so all participants reported at least one aversive event. About one half (58.4%) reported experiencing one or two events, 34% reported experiencing 3-4 events, and 7.6% reported experiencing 5 to 8 different events. The number of different events was computed by dichotomizing each event into presence or absence and

Table 5

Family-of-origin Income Estimates

	Percent	*n*
Income in Dollars		
> 150,000	8.0	34
100,000-149,999	9.5	40
75,000-99,999	13.5	57
50,000-74,999	11.6	49
25,000-49,999	10.6	45
10,000-24,999	6.6	28
< 10,000	6.6	28
Unsure	33.6	142
Perception of Economic Situation		
Barely enough to get by	4.7	20
Enough to get by but no more	18.4	78
Solidly middle class	41.4	175
Plenty of extras	18.7	79
Plenty of luxuries	4.7	20
Unsure	12.1	51

summing the number of traumas classified as "present" for each individual.

Cognitive Characteristics

Avoidance. High scores on the PSWQ are indicative of higher levels of worry. Scores

can range from 16 to 80. Participants in this sample endorsed a moderate level of worry (*M* =

49.9, *SD* = 14.7), with scores ranging from 20 to 80. The mean item rating was a 3.1 on a scale of 1 to 5.

High scores on the WBSI are associated with higher levels of thought suppression. Scores can range from 15 to 75. Participants in this sample also endorsed a moderate level of thought suppression (*M* = 49.4, *SD* = 12.7), with scores ranging from 15 to 75. The mean item rating was a 3.29 on a scale of 1 to 5.

Similar to the PSWQ and WBSI, high scores on the AAQ are indicative of higher use of avoidance. Scores ranged from 13 to 57 (out of a possible 9 to 63) (*M* = 34.7, *SD* = 8.2). The mean item rating was a 3.9 on a scale of 1 to 5, corresponding to a moderate endorsement of using avoidance when stressed.

Cognitive schemas. High scores on the PTGI are associated with greater perception of benefit resulting from participants' worst events. Total scores can range from 0 to 105. Total scores ranged from 0 to 105 with a mean of 50.7 and standard deviation of 26.1. Participants in this sample reported, on average, a small degree of benefit from their stressful experience (mean item rating = 2.4 on a scale of 0-5). Highest benefits were reported in the areas of appreciation of life (*M* = 2.9, *SD* = 1.5), followed by personal strength (*M* = 2.7, *SD* = 1.4), relating to others (*M* = 2.3, *SD* = 1.4), new possibilities (*M* = 2.1, *SD* = 1.5), and spiritual change (*M* = 2.0, *SD* = 1.9).

Higher scores on the PTCI are associated with more negative posttraumatic cognitions. Scores ranged from 36 to 230 out of a possible range of 36-252 (*M* = 82.1, *SD* = 33.8). Participants endorsed more positive posttraumatic cognitions, evidenced by an average rating score of 2.3, which corresponds to a slight disagreement with statements representing negative cognitions. Participants reported more negative posttraumatic cognitions about the world (*M* =

3.4, *SD* = 1.5) compared to negative cognitions about self (*M* = 1.8, *SD* = 0.9) and self-blame (*M* = 2.4, *SD* = 1.5).

Resiliency. Higher scores on the DRI are indicative of more hearty personalities. Scores ranged from 18 to 84 out of a possible range of 0 to 90, with a mean of 58.1 and standard deviation of 9.3. Participants endorsed moderate levels of agreement with statements representing resilience, evidenced by an average item rating of 1.9 on a scale of 0 to 3. Participants reported a greater endorsement of commitment (*M* = 21.5, *SD* = 4.4) than control (*M* = 20.1, *SD* = 3.5) and challenge (*M* = 16.6, *SD* = 4.4).

Higher scores on the SES indicate higher degrees of perceived self-efficacy. Scores ranged from 44 to 313 out of a possible range of 14 to 322 (*M* = 223.5, *SD* = 43.4. Participants endorsed moderate degrees of perceived self-efficacy (average item rating = 9.7 on a scale of 1 to 14). Participants reported a greater sense of general self-efficacy (*M* = 10.0, *SD* = 2.0) than social self-efficacy (*M* = 8.8, *SD* = 2.5).

Higher scores on the ACQ are associated with a greater sense of perceived control over stressors. Scores ranged from 32 to 144 out of a possible 0 to 150 (*M* = 94.0, *SD* = 21.1). Participants endorsed a moderate degree of perceived control, evidenced by an average item rating of 3.1 on a scale of 0 to 5.

Higher scores on the CSES are associated with a greater estimation of one's coping abilities. Scores ranged from 19 to 260 out of a possible 0 to 260 (*M* = 168.1, *SD* = 45.6). Participants endorsed a moderate estimation of their coping abilities, evidenced by an average item rating of 6.5 on a scale of 0 to 10.

Trauma Severity

Participants also reported a relatively high level of PTSD symptomology for a non-clinical population. Using the recommended PCL-C cut-off score of 50 (Weathers et al., 1993), 13.9% ($n = 59$) of the sample fell in the PTSD-probable range. The scores ranged from 17 to 74 out of a possible 17 to 85 ($M = 35.3$, $SD = 12.5$). Approximately one third of the sample obtained scores between 17 and 28, one third between 29 and 39, and one third between 40 and 74.

Predictors of PTSD Symptoms for Criterion A Events (Hypothesis 1)

The first hypothesis is that event, person, and cognitive characteristics would predict PTSD symptoms in response to events that satisfy criterion A. Bivariate correlations and multiple regression analyses were used to examine the relationships among these variables. A one-way ANOVA was also used to test whether mean PTSD scores differed according to relationship with offender among those who endorsed rape as their worst event.

Zero-order correlations (for continuous variables) and point-biserial correlations (for categorical variables) between PTSD symptom totals and each independent variable are found in the "Criterion A" column of Table 6. To reduce the likelihood of committing a Type I error associated with running multiple tests, a significance level of .01 was used. Consistent with expectations, higher ratings of life threat and injury at the time of the trauma were both associated with higher scores on the PCL-C. Perception of support at the time of the event and perception of support now were not significantly related to PTSD symptoms, but there was a trend for lower perception of support at the time of the event to be associated with higher PTSD symptoms. Current age, event type, sex, and income were unrelated to PTSD symptoms. Higher PTSD scores were associated with a greater number of traumas endorsed. Finally, almost all scores on cognitive measures were significantly related to PTSD scores in the predicted

Table 6

Correlations between PTSD Scores and Event, Person, and Cognitive variables

Model Variables	Correlation with PTSD scores	
	Criterion A	Non-criterion A
Event Variables		
Event type	.14	.00
Threat	.16*	.10
Injury	.19*	.20*
Support then	-.11+	-.14
Support now	.09	.08
Person Variables		
Sex	.15	.10
Age	-.04	-.09
Trauma History	.22*	.32*
Income	-.01	.05
Cognitive Variables		
PSWQ	.42*	.44*
WBSI	.29*	.36*
AAQ	.35*	.53*
PTGI	.32*	.23*
PTCI	.58*	.67*
DRI	-.27*	-.38*
SES	-.27*	-.30*
CSE	-.33*	-.32*
ACQ	-.46*	-.47*

Note: + $p < .05$, * $p < .01$

directions. Higher scores on measures of avoidance (i.e., PSWQ, WBSI, and AAQ) and

posttraumatic cognitions (i.e., PTCI) were associated with higher PTSD scores. Higher scores on

measures of resiliency (i.e., DRI, SES, CSE, and ACQ), which corresponded to lower levels of

perceived helplessness, were associated with lower PTSD scores. The only cognitive variable that was not associated with PTSD symptoms in the predicted direction was benefit-finding (i.e., PTGI), which correlated positively with PTSD symptoms.

The PTGI, PTCI, DRI, and SES each contain several subscales. Zero-order correlations between PTSD symptom totals and subscales corresponding to these measures are found in the "Criterion A" column of Table 7. PTSD scores were positively related to scores on all five subscales of the PTGI. Higher PTSD scores were associated with increased benefits in the areas of relating to others, perceiving new possibilities, obtaining personal strength, experiencing spiritual change, and gaining a new appreciation for life. Higher PTSD scores were associated with higher scores on subscales of the PTCI measuring negative cognitions about self, negative thoughts about the world, and self-blame. The commitment and control subscales of the DRI were both negatively associated with PTSD symptom scores. Finally, the general self-efficacy subscale score was negatively related to PTSD scores, whereas the social self-efficacy subscale score was unrelated to PTSD scores.

The multiple regression with event characteristics entered into the first block, person variables into the second block, and cognitive variables into the third block was significant [$F(12, 219) = 15.07$, $p < .01$]. Only variables that were significant bivariate predictors were included in the model. Variables that were not included were event type, event duration, support at the time of the event, current support, sex, socioeconomic status, and age. Variables that were entered into block 1 included degree of perceived threat and degree of injury. Block 2 consisted of number of previous traumas. Block 3 consisted of scores on cognitive factors related to avoidance (i.e., scores on the PSWQ, WBSI, and AAQ), posttraumatic cognitions (i.e., scores on the PTGI and PTCI), and resilience (i.e., scores on the DRI, SES, CSE, and ACQ). Varying the

Table 7

Correlations between PTSD Scores and Instrument Subscales

Model Variables	Correlation with PTSD scores	
	Criterion A	Non-criterion A
PTGI		
Relating to others	.23*	.13
New possibilities	.35*	.32*
Personal strength	.24*	.17*
Spiritual change	.23*	.15
Appreciation of life	.31*	.18*
PTCI		
Negative cognitions about self	.57*	.68*
Negative cognitions about world	.48*	.54*
Self-blame	.20*	.32*
DRI		
Commitment	-.30*	-.32*
Control	-.21*	-.30*
Challenge	-.09	-.26*
SES		
General	-.27*	-.32*
Social	-.14	-.13

Note: * p < .01

order of the blocks did not affect the results. Tolerance values closer to 0 indicate problematic levels of collinearity. Tolerance statistics for all variables exceeded .74, well above the suggested cut-off of .10 that indicates a potential problem with collinearity (Merler & Vanatta, 2005). No variables were dropped from the equation. See Table 8 for a summary of significant predictors for the criterion A group.

The hypothesis that event, person, and cognitive characteristics would predict PTSD symptom severity was partially supported. When all variables were entered into the equation (see Block 3 in Table 8), none of the event or person variables were significant predictors of PTSD symptoms, but 4 of 9 cognitive variables were significant predictors. Higher scores on measures of negative posttraumatic cognitions (i.e., PTCI scores), perceptions of posttraumatic benefit (i.e., PTGI scores), and worry (i.e., PSWQ scores) predicted higher PTSD scores when all three blocks were entered into the model (i.e., Model 3). Lower scores on perception of control (i.e., ACQ scores) also predicted higher PTSD scores. Because both the PTCI and the PTGI contain subscales, this analysis was rerun with total PTCI and PTGI scores replaced with subscale scores. This model was significant [$F(18, 219) = 11.18$, $p < .01$; $R^2 = .46$]. Only PTCI subscales of negative cognitions about self ($B = .37$, $p < .01$) and world ($B = .20$, $p < .01$) emerged as significant predictors of PTSD symptoms. A separate regression with "relationship to offender" added as an event variable was performed on interpersonal events that met criterion A. Relationship to offender was nonsignificant in this model.

As predicted, greater degree of injury and greater number of previous traumas predicted higher PTSD symptoms prior to the entry of cognitive variables in Step 3 of the hierarchical regression (see Models 1 and 2 of Table 8). These event and person characteristics became nonsignificant when cognitive variables were entered into the model.

Table 8

Summary of Hierarchical Regression Analysis for Variables Predicting PTSD Symptoms for Criterion A Group (N = 220)

Variable	Block 1			Block 2			Block 3		
	B	*SE B*	*β*	*B*	*SE B*	*β*	*B*	*SE B*	*β*
Threat	0.48	0.40	.10	0.26	0.38	.05	0.26	0.30	.05
Injury	0.98	0.48	.15*	0.96	0.47	.15*	0.37	0.38	.06
Trauma History				1.75	0.63	.19**	0.49	0.51	.05
PSWQ							0.12	0.54	.15*
WBSI							-0.04	0.06	-.04
AAQ							0.03	0.11	.02
PTGI							0.11	0.03	.23**
PTCI							0.17	0.03	.42**
DRI							0.06	0.10	.05
SES							0.02	0.02	.07
CSE							-0.01	0.02	-.04
ACQ							-0.10	0.05	-.17*
R^2		.04			.08			.47	
F for change in R^2		5.04			7.79**			16.74**	

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

Contrary to hypotheses, degree of threat and cognitive variables reflected in scores on the WBSI, DRI, CSE, AAQ, and SES did not significantly predict PTSD symptoms when event and person characteristics were entered into the equation.

There was not a significant difference in PTSD scores by offender type for persons who reported rape to be their worst event. A one-way ANOVA was used to compare mean PTSD scores for persons who reported rape by a dating partner, friend or acquaintance, or stranger. Although other response options were possible for the variable assessing relationship to offender, only 15 persons reported rape to be their worst event; responses fell into the three categories listed above. Categories of "friend" and "acquaintance" were combined to produce approximately similar sample sizes across groups. The model was not significant [$F(2, 14) = .28$, *ns*].

Predictors of PTSD Symptoms for Non-criterion A Events (Hypothesis 2)

The second hypothesis is that event, person, and cognitive characteristics would predict PTSD symptoms in response to events that do not satisfy criterion A. Bivariate correlations and multiple regression analyses were used to examine the relationships among these variables in the same manner as described in the previous section.

Zero-order correlations (for continuous variables) and point-biserial correlations (for categorical variables) between PTSD symptom totals and each independent variable are found in the "non-criterion A" column of Table 6. Consistent with expectations and with results from participants who did meet criterion A, higher ratings of injury at the time of the trauma were associated with higher scores on the PCL-C. Perception of support at the time of the event and perception of support now were not significantly related to PTSD symptoms. Current age, sex, income, and event type were unrelated to PTSD symptoms. Higher PTSD scores were associated with a greater number of events endorsed. Finally, most scores on cognitive measures were significantly related to PTSD scores in the predicted directions. The only relationship that was not consistent with hypotheses was for posttraumatic growth (PTGI). More severe PTSD

symptoms were associated with greater perceived growth. As predicted, higher scores on

measures of avoidance (i.e., PSWQ, WBSI, and AAQ) and posttraumatic cognitions (i.e., PTCI)

were associated with higher PTSD scores. Higher scores on measures of resiliency (i.e., DRI,

SES, CSE, and ACQ), which corresponded to lower levels of perceived helplessness, were

associated with lower PTSD scores.

Zero-order correlations between PTSD symptom totals and subscales of the PTGI, PTCI,

DRI, and SES among those reporting a non-criterion A event can be found in the second column

of Table 7. PTSD scores were positively related to scores on all three of the five subscales of the

PTGI (i.e., perceiving new possibilities, obtaining personal strength, and gaining a new

appreciation for life). On the PTCI, scores on subscales measuring negative cognitions about

self, negative thoughts about the world, and self-blame were all associated with higher PTSD

symptom scores. The commitment, control, and challenge subscales of the DRI were all

negatively associated with PTSD symptom scores. Finally, general self-efficacy subscale scores

were negatively related to PTSD scores, whereas social self-efficacy subscales scores were

unrelated to PTSD scores.

The multiple regression with event characteristics entered into the first block, person

variables into the second block, and cognitive variables into the third block was significant

[$F(20, 202) = 14.86$, $p < .01$]. See Table 9 for a summary of significant predictors for the non-

criterion A group. Variables that did not correlate significantly with PTSD scores were not

included in the model. Variables that were not included were event type, event duration,

perception of life threat, support at the time of the event, current support, sex, socioeconomic

status, and age. Degree of injury was entered in Block 1. Block 2 consisted of number of

previous traumas. Block 3 consisted of scores on cognitive factors related to avoidance (i.e.,

Table 9

Summary of Hierarchical Regression Analysis for Variables Predicting PTSD Symptoms for Non-criterion A Group (N = 203)

Variable	Block 1			Block 2			Block 3		
	B	*SE B*	*β*	*B*	*SE B*	*β*	*B*	*SE B*	*β*
Injury	1.82	0.61	.20**	1.33	0.60	.15*	0.57	0.44	.06
Trauma History				2.87	0.67	.29**	1.08	0.50	.11*
PSWQ							0.07	0.06	.08
WBSI							0.00	0.06	.00
AAQ							0.39	0.12	.25**
PTGI							0.05	0.03	.11*
PTCI							0.17	0.02	.49**
DRI							-0.05	0.10	-.03
SES							0.04	0.02	.13
CSE							0.05	0.02	.18*
ACQ							-0.14	0.05	-.22*
R²		.04			.11			.56	
F for change in *R²*		8.77			18.44**			23.50**	

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

scores on the PSWQ, WBSI, and AAQ), posttraumatic cognitions (i.e., scores on the PTGI and PTCI), and resilience (i.e., scores on the DRI, SES, CSE, and ACQ). Tolerance statistics for all variables exceeded .78, well above the recommendation that .10 or less indicates a potential

problem with collinearity (Mertler & Vana, 2005). Varying the order of the blocks did not affect the results.

The hypothesis that event, person, and cognitive characteristics would predict PTSD symptom severity was partially supported. When all variables were entered into the equation (see Block 3 in Table 9), number of previous traumas and scores on 5 of 9 cognitive measures were significant predictors of PTSD symptoms. A greater number of endorsed events and higher scores on measures of negative posttraumatic cognitions (i.e., PTCI scores), perceptions of posttraumatic benefit (i.e., PTGI scores), coping self-efficacy (i.e., CSE scores), and avoidance (i.e., AAQ scores) predicted greater PTSD symptom severity. Lower scores on a measure of perceived control (i.e., ACQ) also predicted higher PTSD scores. Because the PTCI and PTGI contain subscales, this analysis was rerun with total PTCI and PTGI scores replaced with subscale scores. This model was significant [$F(17, 202) = 18.77$, $p < .01$; $R^2 = .63$]. The PTCI subscale of negative cognitions about self and the PTGI subscale of perceiving new possibilities emerged as significant predictors of PTSD symptoms ($B = .54$ and .26, respectively, $p < .01$). A separate regression with "event type" replaced by "relationship to offender" was performed on interpersonal events that did not meet criterion A. Relationship to offender was nonsignificant in this model.

As predicted, greater degree of injury predicted higher PTSD symptoms prior the entry of cognitive variables in Step 3 of the hierarchical regression (see Blocks 1 and 2 of Table 8). This relationship became nonsignificant when cognitive variables were entered into the model.

Contrary to hypotheses, cognitive variables reflected in scores on the SBSI, DRI, SES, and PSWQ did not significantly predict PTSD symptoms when event and person characteristics were entered into the equation.

Cognitive Variables as Mediators (Hypothesis 3)

The third hypothesis that cognitive variables would mediate the relationship between experiencing a trauma and PTSD symptoms was not supported. Trauma exposure (i.e., criterion A met or unmet) did not significantly predict total scores on the PCL-C [$F(1, 422) = 1.81$, ns], so further analyses were unnecessary.

Predictive Ability of Criterion A2 (Hypothesis 4)

The fourth hypothesis was that retrospective ratings of peritraumatic feelings of anger, shock, shame, fear, helplessness, and horror would predict PCL-C scores. It was addressed with two simultaneous multiple regression analyses, one for events that met criterion A1 and one for events that did not meet criterion A1.

The regression analysis for events that met criterion A1 was significant [$F(6, 235) = 6.15$, $p < .01$]. The only rating to significantly predict PCL-C scores, however, was for peritraumatic feelings of anger ($B = .211$, $p < .01$). Ratings of shock, shame, fear, helplessness, and horror did not significantly predict PTSD symptom severity.

The regression analysis for events that did not meet criterion A1 was also significant [$F(6, 186) = 4.95$, $p < .01$]. Again, the only rating to significantly predict PCL-C scores was for peritraumatic feelings of anger ($B = .239$, $p < .01$).

Factor Structure of PTSD (Hypothesis 5)

The fifth hypothesis was that King et al.'s (1998) four-factor intercorrelated numbing model and Simms et al.'s (2002) intercorrelated four-factor dysphoria model would fit the data better than the DSM-IV intercorrelated three-factor model. Table 10 shows how PCL-C items map onto each factor model.

Table 10

Item Mapping for Confirmatory Analyses

DSM-IV symptom	Model		
	3-factor	4-factor numbing	4-factor dysphoria
1. (B1) Disturbing memories	R	R	R
2. (B2) Disturbing dreams	R	R	R
3. (B3) Suddenly reliving	R	R	R
4. (B4) Upset when reminded	R	R	R
5. (B5) Physical reactions when reminded	R	R	R
6. (C1) Avoiding thinking	A, N	A	A
7. (C2) Avoiding activities	A, N	A	A
8. (C3) Trouble remembering	A, N	N	D
9. (C4) Loss of interest	A, N	N	D
10. (C5) Feeling distant	A, N	N	D
11. (C6) Emotionally numb	A, N	N	D
12. (C7) Future cut short	A, N	N	D
13. (D1) Trouble sleeping	H	H	D
14. (D2) Irritable/angry outbursts	H	H	D
15. (D3) Difficulty concentrating	H	H	D
16. (D4) Being "super-alert"	H	H	H
17. (D5) Jumpy/easily startled	H	H	H

Note. DSM-IV = Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition
(American Psychiatric Association, 1994). R = reexperiencing, A = avoidance, N = numbing, H
= hyperarousal (arousal), D = dysphoria

Table 11 contains results for each of the 3-factor models tested with the whole sample ($n = 423$), participants with criterion A present ($n = 220$), and participants with criterion A absent ($n = 203$). As hypothesized, the 4-factor models both fit the data better than the 3-factor model did. Fit indices suggest that the 4-factor dysphoria model provides the best fit to the data from the whole sample and from participants with criterion A present. For participants with a worst trauma that does not meet criterion A, however, the 4-factor numbing model provides a slightly better fit to the data than does the 4-factor dysphoria model. It should be noted that the fit indices for the whole sample are the most acceptable, although RMSEA values closer to .05 are preferred. Fit indices for the groups (criterion A and non-criterion A) are not as strong as the fit indices for the combined group. The hypothesis, however, was to test whether the 4-factor numbing and dysphoria model fit the data better than the 3-factor DSM model. The data support this hypothesis.

Because the 4-factor dysphoria model was favored in the data from the whole sample and from participants with criterion A present, it was used to examine factorial invariance across the two groups (i.e., criterion A present and criterion A absent). Table 12 shows fit indices when factor loadings were free and for when they were constrained to be equal across the two samples. The first row (i.e., "Fully [all factor loadings] free") suggests configural invariance; all fit indices show good to acceptable fit. The second row (i.e., "Fully [all factor loadings] fixed") lists the results when factor loadings for each symptom cluster (i.e., reexperiencing, avoidance, dysphoria, hyperarousal) were constrained to be equal. Compared to the fully free findings, constraints on the loadings do not damage model-data fit ($\Delta\chi^2_{(13)} = 18.02$, ns); therefore, metric invariance is also supported. The results of this analysis suggests that the 4-factor dysphoria model fits both samples (i.e., criterion A present and criterion A absent) equally well.

Table 11

Goodness-of-fit Statistics for PCL-C Models

Model	χ^2	df	GFI	AFGI	RMSEA	RMR	$\Delta\chi^2$
Total Sample							
3-factor	420.17	116	.89	.85	.08	.09	
4-factor numbing	330.50	113	.91	.88	.07	.07	89.67
4-factor dysphoria	294.84	113	.92	.90	.06	.07	125.33
Criterion A Present							
3-factor	312.26	116	.85	.80	.09	.12	
4-factor numbing	275.45	113	.87	.82	.08	.10	36.81
4-factor dysphoria	245.17	113	.89	.84	.07	.09	67.09
Criterion A absent							
3-factor	305.57	116	.86	.81	.09	.09	
4-factor numbing	255.63	113	.88	.83	.08	.08	49.94
4-factor dysphoria	261.47	113	.83	.83	.08	.08	44.10

Discussion

This study examined the relative contributions of event and personal characteristics in the

severity of PTSD symptoms in response to events that do and do not meet criterion A. The

present investigation had several aims. First, it was designed to assess the relative contribution of

event and person characteristics to PTSD symptoms in a sample of persons exposed to a variety

of types of trauma. Second, it was designed to assess the predictors of PTSD symptoms in

response to events that do not satisfy criterion A (in its entirety) in the DSM-IV's diagnostic

system. Third, this study reexamined the nature of PTSD as described in the DSM-IV by

Table 12

Factorial Invariance of 4-Factor Dysphoria Model across Samples

Model	χ^2	df	GFI	AFGI	RMSEA	RMR
Fully (all factor loadings) free	506.65	226	.88	.84	.05	.09
Fully (all factor loadings) fixed	524.67	239	.88	.84	.05	.10
Reexperiencing factor loadings free	520.53	235	.88	.84	.05	.09
Avoidance factor loadings free	524.30	238	.88	.84	.05	.09
Dysphoria factor loadings free	511.30	232	.88	.84	.05	.09
Hyperarousal factor loadings free	524.57	238	.88	.84	.05	.09

assessing the impact of expanding criterion A2 to include other emotional reactions and by reexamining the factor structure of PTSD symptoms. The overall goal of this paper was to examine whether current models of PTSD can be extended to explain the development of PTSD-like responses to non-criterion A events.

The first two hypotheses related to the predictors of PTSD symptoms for events that meet criterion A and events that do not satisfy criterion A. It was expected that event, person, and cognitive factors would predict PTSD symptoms for both types of events but that cognitive factors would emerge as stronger predictors of PTSD symptoms for non-criterion A events than for criterion A events. Results generally supported this prediction. When all variables were entered into the predictive model, cognitive variables were the strongest predictors of PTSD symptom severity for both qualifying and nonqualifying events, but a greater number of cognitive factors emerged as significant predictors for events that did not meet criterion A than for events that did meet criterion A. Additionally, the beta weights for significant cognitive predictors of PTSD symptoms were slightly larger in the non-criterion A group for all but

posttraumatic benefits and worry (i.e., PTGI and PSWQ scores, respectively). The predictors of PTSD symptoms for the criterion A group in order of strength were posttraumatic cognitions (PTCI scores; $B = .42$), posttraumatic growth (PTGI scores; $B = .23$), perception of control (ACQ scores; $B = -.17$), and worry ($B = .15$). The predictors of PTSD symptoms for the non-Criterion A group in order of strength were posttraumatic cognitions (PTCI scores; $B = .49$), use of avoidance (AAQ scores; $B = .25$), perception of control (ACQ scores; $B = -.22$), coping self-efficacy (CSE scores; $B = .18$), posttraumatic growth (PTGI scores; $B = .11$), and trauma history ($B = .11$).

Although the cross-sectional nature of this study precludes explanations of cause-and-effect, the finding that cognitive variables were such strong predictors of PTSD symptoms compared to event and person factors supports cognitive models of the etiology of PTSD that suggest that PTSD symptoms arise from avoidance (e.g., Ehlers & Clark, 2000; Foa et al., 1989), the presence of information incompatible with pre-existing cognitive schemas (Janoff-Bulman, 1989; Wells, 2000), and the perception of helplessness (Mikulincer & Solomon, 1988; Seligman, 1975). This study suggests that cognitive vulnerabilities predict PTSD symptoms above and beyond the effect of event and more distal person characteristics and provides an explanation for why people sometimes develop PTSD-like responses to events that do not meet criterion A (Bodkin, Pope, Detke, & Hudson, 2007) and why many people never develop PTSD after experiencing events that meet criterion A (Kessler et al., 1995). Longitudinal studies, however, are needed to test the hypothesis that cognitive vulnerabilities contribute to PTSD development and maintenance.

Although cognitive variables were the strongest predictors of PTSD symptom severity, some additional variables emerged as significant predictors of PCL-C scores prior to the entry of

cognitive variables in Step 3 of the model. In the cluster of event characteristics, degree of injury predicted symptoms for both the criterion A group and the non-criterion A group. These findings support other research that suggests that PTSD risk is elevated when persons are exposed to an event that is rated as producing more bodily injury (e.g., Kilpatrick et al., 1989). In the cluster of person variables, trauma history also emerged a significant predictor of PTSD symptoms prior to the entry of cognitive variables into the model for the non-criterion A group. Trauma history remained significant when cognitive variables were entered into the model for the criterion A group. This is consistent with studies that show an elevated risk of PTSD with exposure to multiple traumas (e.g., Kessler et al., 1995).

An unexpected finding was that greater coping self-efficacy (i.e., higher CSE scores) was predictive of higher PTSD scores in the non-criterion A group. Although the zero-order correlation was in the predicted direction of higher coping scores associated with lower PTSD scores, the independent contribution of coping scores to variability in PTSD scores when other measures were included was in the other direction. An examination of bivariate correlations between the CSE and other measures suggests that scores on the CSE correlate moderately with DRI scores (.61), ACQ scores (.65), and AAQ scores (-.59). When DRI, ACQ, and AAQ scores are excluded from the regression model, CSE scores relate to PTSD scores in the predicted direction, albeit this relationship is nonsignificant. This finding suggests that other variables in the model suppress the relationship between coping self-efficacy scores and PTSD severity. It is also important to note here that there was an order effect for the other measure of self-efficacy, the SES. When it was administered slightly earlier in the sequence of measures (Sequence 1: DRI, SES, ACQ, CSES, WBSI, AAQ, and PSWQ), scores were lower than when it was administered later (Sequence 2: PSWQ, DRI, SES, ACQ, AAQ, CSES, and WBSI). The only

difference in measures preceding the SES between the sequences is that persons who completed

Sequence 1 completed the worry questionnaire (PSWQ) prior to their completion of the general

coping measure (SES). It is possible that the PSWQ primed participants to rate their coping to be

less effective than did participants who had not completed the PSWQ yet. Further studies should

examine the effects of mood manipulation on scores on measures of coping to determine whether

participants' moods influence their responses to measures.

Event characteristics of trauma duration, social support surrounding the event, and event

type did not correlate significantly with PTSD symptom severity in either group. It is likely that

event duration was not significant in this sample due to the relative lack of variability on this

item; the majority of the sample ($n = 381$) reported discrete events, whereas a minority ($n = 42$)

reported chronic events. Studies examining the relationship between PTSD and event duration

tend to use samples of persons who have all been exposed to chronic traumas, such as combat

exposure (e.g., Buydens-Branchey & Noumair, 1990).

Although social support did not predict PTSD symptom severity for either group, there

was a trend for lower perceived support at the time of the event to relate to higher PTSD scores

($r = -.14$, $p = .05$) in the non-criterion A group, which is consistent with research demonstrating a

negative relationship between support and PTSD symptoms (e.g., Hyman, 2003). A limitation of

this study is that social support at the time of the event was assessed by a single item assessing

retrospective perceptions of support. Perceptions of support at the time of an event may change

over time. Evidence for a bias in recall of social support over time was found in a study by

Norris and Kaniasty (1992) that compared ratings of social support after a hurricane over a 9-

month interval. The authors found that ratings of social support increased over time.

Longitudinal studies that assess perceived social support shortly after an event, therefore, would

be helpful to determine whether perceptions of support at the time of the event predict

subsequent symptom development. There is some evidence that social support does predict

PTSD symptoms later in time. Kaniasty and Norris (2008) used structural equation modeling to

suggest a causal relationship between higher levels of perceived social support at 6-months post-

disaster and less PTSD at 12 months post-disaster. More longitudinal studies of this nature are

necessary to support the theory that lower levels of social support contribute to the development

of PTSD.

Although event type did not emerge as a significant predictor of PTSD symptoms, a *t*-test

comparing PTSD symptom severity means between interpersonal events and non-interpersonal

events indicates that persons in the criterion A group who reported a worst event of an

interpersonal nature had significantly higher PTSD scores ($M = 37.19$, $SD = 11.93$) than did

persons who reported a worst event of a non-interpersonal nature ($M = 33.8$, $SD = 11.69$). This

finding supports other research that suggests that PTSD risk is elevated when persons are

exposed to an event that is of an interpersonal nature (e.g., Kessler et al., 1995).

The event characteristic of perception of life threat was significantly related to PTSD

symptom severity in the criterion A group, but this relationship was not significant in the non-

criterion A group. Life threat became nonsignificant in the criterion A group when degree of

injury was included in the model. The positive relationship between life threat and degree of

injury ($r = .44$, $p < .01$) indicates that persons who rated degree of injury more highly also tended

to rate life threat more highly. It is not surprising that life threat did not relate to PTSD symptom

severity in the non-criterion A group, because very few events in this group involved life threat

(see Table 4).

In the cluster of person characteristics, sex, age, and income did not relate to PTSD symptoms in either group. The lack of a significant relationship between age and PTSD symptoms is consistent with findings from Kessler et al.'s (1995) epidemiological study of persons in the United States. The finding that income was unrelated to PTSD symptom severity is inconsistent with the majority of studies that find a negative relationship between income and PTSD symptoms (e.g., Cwikel et al., 2008; Sutker et al., 1990; Tennant et al., 1986). A limitation of using college students is that they reported their parents' SES and likely were unaware of their parents' actual income. Also, years of education varied little in this sample, so it could not be used as a measure of SES. It is surprising, however, that female sex did not predict PTSD symptoms. Mean PTSD symptom scores, however, were significantly higher in women than in men [$t(419)=2.64$, $p < .01$]. The mean for women on the PCL was 36.3 ($SD=12.5$); for men, it was 32.9 ($SD=12.1$). Because the age of the sample varied very little, future studies should examine sex differences in PTSD severity at different age and education levels. It is possible that the homogeneity of age and education in this sample resulted in a smaller sex difference in PTSD symptom severity that might be found in samples with more variability in demographic variables.

Most cognitive variables were associated with PTSD symptoms in the predicted direction in zero-order correlations. Experiential avoidance (AAQ, PSQ, and WBSI scores) and negative core beliefs (PTCI scores) were associated with greater PTSD symptom severity, whereas hardiness (DRI scores) and self-efficacy (SES, CSES, and ACQ scores) were associated with lower PTSD symptom severity. These findings are consistent with studies that show an elevated risk of PTSD with the presence of cognitive risk factors, such as worry (e.g., Roussis & Wells, 2006), experiential avoidance (e.g., Steil & Ehlers, 2000), and negative core beliefs (Foa et al.,

1999). The findings of this study also support research that suggests that PTSD risk is lower

when persons endorse higher levels of hardiness (King et al., 1999), and self-efficacy (Benight et

al., 1997). The finding that benefit-finding was positively associated with PTSD symptoms is

inconsistent with theory that posits that benefit-finding may represent adequate emotional

processing of an event (McMillen et al., 1997); however, this finding is consistent with the

majority of studies that find benefit-finding to be positively associated with PTSD symptoms

(e.g., McMillen & Fisher, 1998, Tedeschi & Calhoun, 1996). This finding supports the

implication suggested by Tedeschi and Calhoun that perception of benefit may be triggered by

severity of negative symptoms associated with the stressor.

As mentioned earlier, cognitive variables emerged as the strongest predictors of PTSD

symptoms for both the criterion A group and the non-criterion A group. The finding that

posttraumatic cognitions and benefit-finding predicted PTSD symptoms in both groups provides

the most evidence for the cognitive theory of PTSD that implicates the inadequate incorporation

of trauma-related information into preexisting schemas (Janoff-Bulman, 1989; Wells, 2000).

This study also provides some support for theories of PTSD that highlight the role of avoidance

in keeping memories from consolidating (Ehlers & Clark, 2000; Foa et al., 1989); the use of

experiential avoidance predicted PTSD symptoms for the non-criterion A group. Only one of

four measures of coping significantly predicted PTSD symptoms in the predicted direction (i.e.,

perception of control), so there is limited support for the theories of PTSD that posit that the

perception of helplessness contributes to inadequate coping (Mikulincer & Solomon, 1988;

Seligman, 1975).

This study supports current theoretical models of PTSD but suggests that a combination

of all three models (i.e., conflicting schemas, avoidance, and helplessness) may best describe the

development of PTSD. Findings from this study highlight the role of negative posttraumatic cognitions, the perception of a lack of control over events and emotions, and the tendency to avoid thinking about stressful experiences in the development of PTSD symptoms. A revised model is proposed that integrates components of current models of PTSD. This integrative model suggests that persons who respond to trauma with negative beliefs about themselves and the world likely experience stronger emotional reactions than persons who respond with more adaptive beliefs. High levels of distress, coupled with a belief that one cannot control these reactions nor prevent future stressors, could lead to greater avoidance of emotions and thoughts associated with stressors. The faulty cognitions and associated distress could lead to reexperiencing and hyperarousal symptoms that further increase distress and motivate a person to engage in greater avoidance. The use of avoidance may serve to maintain faulty cognitions and the belief that one cannot control emotional reactions or future stressors, resulting in a cycle that maintains PTSD symptoms over time. This model integrates learned helplessness models (e.g., Seligman, 1975), models that implicate faulty cognitions (e.g., Janoff-Bulman, 1989; Wells, 2000), and avoidance models (e.g., Ehlers & Clark, 2000; Foa et al., 1989) of PTSD development. This model could be tested in longitudinal studies that use structural equation modeling analyses to test models of causal relationships among posttraumatic beliefs, perceptions of helplessness, use of avoidance, and PTSD symptoms.

There was not a significant relationship between trauma exposure (defined as experiencing an event that satisfied criterion A1) and PTSD symptoms in this sample, so cognitive variables could not be tested for mediation. PTSD symptom severity did not differ between the criterion A group and the non-criterion A group [$t(421)=1.3$, *ns*]. It is possible that trauma and PTSD symptoms were not related in this study, because participants who did not

experience a qualifying event may have selected a "worst experience" that was associated with current distress, artificially elevating PTSD symptoms compared to persons who reported a worst experience further in the past that met criterion A. Future research should control for "time since event" when testing whether cognitive variables mediate the relationship between trauma exposure and PTSD symptoms.

This study also examined the predictive ability of an expanded A2 criterion. Interestingly, ratings of fear, horror, and helplessness did not predict PTSD symptoms, but ratings of anger did predict PTSD symptoms for both the criterion A group and the non-criterion A group. This is consistent with Brewin et al.'s (2000) finding that heightened levels of anger with others and shame predicted PTSD in the absence of reported initial fear, helplessness, or horror. The literature on the predictive ability of criterion A2 indicates that the relationship between peritraumatic feelings and PTSD is not clear. Some studies find that fear, helplessness, and horror do indeed predict PTSD symptoms (e.g., Brewin et al.), whereas others find that only helplessness predicts PTSD symptoms (e.g., Roemer et al., 1998b). The current study utilized a nonclinical sample of persons who retrospectively rated their responses to events, and the majority of participants did not qualify for a diagnosis of PTSD. More longitudinal studies are needed that assess criterion A2 near the time of a potentially traumatic event and track participants for several months to determine whether feelings near the time of the event predict subsequent PTSD.

The factor structure of the PCL-C supported the hypothesis that King et al.'s (1998) four-factor intercorrelated numbing model and Simms et al.'s (2002) intercorrelated four-factor dysphoria model would fit the data better than the DSM-IV intercorrelated three-factor model. Simms et al.'s dysphoria model fit the data best, and factorial invariance was established for the

two groups (criterion A and non-criterion A). This is consistent with findings from samples of

Gulf War veterans (Simms et al.), undergraduates (Baschnagel et al., 2005; Hoyt & Yeater,

2007), and motor vehicle accident survivors (Elklit & Shevlin, 2007).

The results of this study support the role of cognition in PTSD. Negative posttraumatic

cognitions about self and world, self-blame, perception of lack of control, and avoidance were

strong predictors of PTSD above and beyond the influence of event and personal demographic

and history data. Cognitive factors were strong predictors of PTSD symptoms for events that met

criterion A as well as for non-criterion A events. The finding that cognitive factors were stronger

predictors of PTSD symptoms for non-criterion A events than for criterion A events supports the

diathesis-stress model of PTSD. Some people may have cognitive styles that predispose them to

the development of PTSD-like responses to events that may not even qualify for criterion A.

Although predictors of PTSD varied for criterion A versus non-criterion A events, the factor

structure was similar, suggesting that trauma responses to non-criterion A events may look very

similar to trauma responses to criterion A events. In other words, PTSD is PTSD, but some

people are predisposed to develop it in response to subthreshold (i.e., non-criterion A) events.

Future research should examine this phenomenon in a clinical population in which more

people meet criteria for PTSD symptoms. This study utilized a nonclinical sample with a low

prevalence of PTSD (estimated 13.9%). Interestingly, of the 59 persons who exceeded the PCL-

C cut-off of 50, there was an almost equal split between criterion A and non-criterion A events

(i.e., 31 met criterion A and 28 did not). This statistic suggests that findings from a clinical

sample may mirror the results from this sample.

Future research should also use a clinical interview, such as the gold standard in PTSD

diagnosis, the Clinician-Administered PTSD Scale (CAPS; Blake et al., 1995). Some limitations

of the current study could also be addressed, such as broadening the sample in terms of education and age. Factors such as socioeconomic status and age may emerge as predictors of PTSD symptoms in a sample with more variation in these variables.

The cross-sectional nature of the data is a factor that limits the conclusions that can be drawn from this study. Future research should track participants over the course of several years to determine whether pre-trauma cognitive styles actually predict development of PTSD symptoms in response to subsequent potentially-traumatic events. Additionally, criterion A2 cannot be reliably assessed in a cross-sectional study. Retrospective reports of feelings immediately after a trauma may be biased by current levels of distress. Although the assessment of criterion A2 immediately after trauma in a research study is usually not feasible, laboratory experiments with mood induction could examine the relationship between current mood and retrospective reports of emotions following a traumatic event.

This study suggests that a reevaluation of the diagnostic criteria for PTSD is warranted. Symptoms do not form the three-factor model outlined in the DSM-IV but rather a four-factor model similar to what has been found in the majority of factor analytic results of PTSD measures (e.g., Asmundson et al., 2000; King & King, 1994; Norris et al., 2001; Simms et al., 2002). Further, the same model fit data from persons who reported a worst event that met criterion A and from persons who reported a worst event that did not meet criterion A. The similarity in model fit suggests that PTSD from "trauma" and PTSD from "nonqualifying events" have the same presentation. This challenges the assumption that the satisfaction of criterion A is a necessary component of the diagnosis. Similarly, the finding that cognitive variables were the strongest predictors of PTSD symptoms for both the criterion A and the non-criterion A group also challenges the notion that characteristics of an event are a primary component in the

development of PTSD. As suggested by proponents of cognitive models of PTSD (e.g., Ehlers & Clark, 2000; Foa et al., 1989; Janoff-Bulman, 1989; Mikulincer & Solomon, 1988; Seligman, 1975; Wells, 2000), a person's cognitive reaction to an event is more important than the event itself in the development of PTSD. The importance of cognitions in a person's response to an event underlies the success of treatments that address cognitive processing, such as exposure-based therapies and broader cognitive-behavioral therapies.

The findings of this study fit relatively well with the DSM-V task force's recently released proposal for changes in the diagnostic criteria of PTSD. The members of the task force have recommended a 4-factor model that includes clusters of reexperiencing symptoms, avoidance, negative changes in cognitions or mood, and hyperarousal symptoms. These recommendations are consistent with findings from this study, specifically in the strong relationship between posttraumatic cognitions and PTSD symptoms in the current sample. Their suggestion to discard criterion A2 but add a symptom of pervasive negative emotional states (i.e., fear, horror, anger, guilt, or shame) to the criteria is also supported by findings from the current study and other literature suggesting that feelings of anger, guilt, and shame are often associated with PTSD symptoms (i.e., Brewin et al., 2000).

In addition to implications for the diagnostic criteria for PTSD, this study adds to the body of literature that highlights the importance of further examining the link between cognitions and PTSD. Specifically, longitudinal studies could determine whether pre-trauma cognitive styles predict PTSD symptoms after a potentially-traumatic event. Studies could also examine the stability of cognitive styles (i.e., views about self, world, and others) over time.

Results from longitudinal studies that explain the relationship between cognitions and the development of PTSD could inform treatment outcome studies as well. Treatment outcome

studies could examine changes in posttraumatic cognitions and other cognitive styles following therapy. Foa and Rauch (2004) found that posttraumatic cognitions about self, world, and self-blame became significantly more positive after 54 female survivors of assault received 9 to 12 weekly sessions of prolonged exposure therapy. It is currently unknown, however, whether evidence-based treatments, such as cognitive processing therapy and prolonged exposure, can alter both cognitions directly related to the impact of trauma (i.e., posttraumatic cognitions, posttraumatic growth) as well as more general cognitive styles (i.e., experiential avoidance, worry, self-efficacy). If longitudinal studies implicate cognitive factors in the development of PTSD and if treatment outcome studies suggest that certain treatments can alter cognitions, then treatments could actually serve as a protective factor against the development of future stress-related symptoms.

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Appendix A

Demographics Questionnaire

Age: _____

Sex: ☐ Female   ☐ Male

Some people identify themselves as belonging to one or more racial or ethnic groups. Please check the box(es) below which correspond to group(s) you belong to:

White or Caucasian   ☐
Black or African-American   ☐
Hispanic or Latino   ☐
Native American   ☐
Alaskan Native   ☐
Asian   ☐
Pacific Islander   ☐
Do you consider yourself to be of any *other* race or ethnic group? Yes ☐   No ☐
          If so, what is it? _____

Marital status: (Check one answer.)
☐   Married
☐   Single
☐   Divorced
☐   Remarried
☐   Widowed
☐   Separated
☐   Living with partner
          Same Sex ___   Other Sex ___

Living Arrangements: (Check one answer.)
☐   Family
☐   Alone
☐   One Roommate
☐   Two or Three Roommates
☐   Large Group (more than three roommates)

Annual household income of family of origin: (Check one answer.)
☐   ≥$150,000
☐ $100,000-$149,999
☐ $75,000-$99,999
☐ $50,000-$74,999
☐ $25,000-$49,999
☐ $10,000-$24,999
☐   ≤$9,999
☐   Don't know, or prefer not to say

How would you describe the **economic situation** of your family as you were growing up? (Check one answer.)

☐   We had barely enough to get by
☐   We had enough to get by, but no more
☐   We were solidly middle class
☐   We had plenty of "extras"
☐   We had plenty of "luxuries"
☐   Don't know/unsure/prefer not to say

School Status: (Check one answer.)
☐   Freshman
☐   Sophomore
☐   Junior
☐   Senior
☐   Graduate Student
☐   Other _____

Number of Past Therapy Sessions (for any reason): (Check one answer.)
☐   0
☐   1-5
☐   6-10
☐   11-20
☐   > 20

Appendix B

Traumatic Events Questionnaire-Revised

Event Scale-Civilian

‑‑‑

DIRECTIONS: This questionnaire is comprised of a variety of traumatic events that you may have experienced. For each of the following "numbered" questions, indicate whether or not you experienced the event. If you have experienced one of the events, circle "Yes" and complete the "lettered" items immediately following it that ask for more details. If you have not experienced the event, circle "No" and go to the next "numbered" item.

‑‑‑

No Yes 1. **Have you been in or witnessed a <u>serious</u> industrial, farm, or car accident, or a large fire or explosion?**

    a. How many times? once □ twice □ three + □

    b. How old were you at that time(s)? 1st ____ 2nd ____ 3rd ____

    c. Were you injured?

        Not at all   Severely

          1 2 3 4 5 6 7

    d. Did you feel your life was threatened?

        Not at all   Extremely

          1 2 3 4 5 6 7

    e. How traumatic <u>**was**</u> this for you at that time?

        Not at all   Extremely

          1 2 3 4 5 6 7

    f. How traumatic <u>**is**</u> this for you now?

        Not at all   Extremely

          1 2 3 4 5 6 7

    g. What was the event? _____

    h. Was alcohol or a recreational drug a factor in this event? Indicate your answers below.

        I was intoxicated

        Not at all   A lot

          1 2 3 4 5 6 7

        Somebody else involved was intoxicated.

        Not at all   A lot

          1 2 3 4 5 6 7   □ Don't know

No Yes 2. **Have you received news of the mutilation, serious injury, or violent or unexpected death of someone close to you?**

    a. How many times? once □ twice □ three + □

    b. How old were you at that time(s)? 1st ____ 2nd ____ 3rd ____

    c. What relation was this person to you? _____

    d. What happened to the person in general terms (e.g., accident, shooting, suicide, etc.)?

    _____

    e. Did you feel your life was threatened?

        Not at all   Extremely

          1 2 3 4 5 6 7

    f. How traumatic <u>**was**</u> this for you at that time?

        Not at all   Extremely

          1 2 3 4 5 6 7

    g. How traumatic <u>**is**</u> this for you now?

        Not at all   Extremely

          1 2 3 4 5 6 7

No Yes 3. Have you been in a natural disaster such as a tornado, hurricane, flood or major earthquake?

        a. How many times? once ☐   twice ☐   three + ☐

        b. How old were you at that time(s)? 1^{st}_____ 2^{nd}_____ 3^{rd}_____

        c. Were you injured?

            Not at all   Severely

             1   2   3   4   5   6   7

        d. Did you feel your life was threatened?

            Not at all   Extremely

             1   2   3   4   5   6   7

        e. How traumatic **was** this for you at that time?

            Not at all   Extremely

             1   2   3   4   5   6   7

        f. How traumatic **is** this for you now?

            Not at all   Extremely

             1   2   3   4   5   6   7

        g. What was the event? _____

        h. Was alcohol or a recreational drug a factor in this event? Indicate your answers below.

            I was intoxicated

            Not at all   A lot

             1   2   3   4   5   6   7

No Yes 4. Have you been a victim of a nonsexual violent crime such as robbery or assault?

        a. How many times? once ☐   twice ☐   three + ☐

        b. How old were you at that time(s)? 1^{st}_____ 2^{nd}_____ 3^{rd}_____

        c. Were you injured?

            Not at all   Severely

             1   2   3   4   5   6   7

        d. Did you feel your life was threatened?

            Not at all   Extremely

             1   2   3   4   5   6   7

        e. How traumatic **was** this for you at that time?

            Not at all   Extremely

             1   2   3   4   5   6   7

        f. How traumatic **is** this for you now?

            Not at all   Extremely

             1   2   3   4   5   6   7

        g. What was the crime? _____

        h. What was your relationship to the assailant?

            ☐ Relative

                Please specify the relationship (e.g., sibling, cousin, etc.). _____

            ☐ Friend

            ☐ Acquaintance

            ☐ Stranger

            ☐ Other, please specify _____

        i. How emotionally close were you to the assailant prior to the event?

            Not at all close   Extremely close

              1   2   3   4   5   6   7

        j. Was alcohol or a recreational drug a factor in this event? Indicate your answers below.

            I was intoxicated

            Not at all   A lot

             1   2   3   4   5   6   7

            The offender was intoxicated

            Not at all   A lot

             1   2   3   4   5   6   7   ☐ Don't know

No Yes 5. <u>As a child</u>, were you the victim of either physical or sexual abuse?

a. How old were you when it began? _____
b. How old were you when it ended? _____
c. Were you injured?
   Not at all   Severely
      1   2   3   4   5   6   7
d. Did you feel your life was threatened?
   Not at all   Extremely
      1   2   3   4   5   6   7
e. How traumatic **was** this for you at that time?
   Not at all   Extremely
      1   2   3   4   5   6   7
f. How traumatic **is** this for you now?
   Not at all   Extremely
      1   2   3   4   5   6   7
g. Was the assailant male or female? Male ☐ Female ☐ Both ☐
h. How was the assailant related to you?
      ☐ Parent/Step-parent
      ☐ Sibling/Step-sibling
      ☐ Other relative
            Please specify the relationship (e.g., cousin, grandparent). _____
      ☐ Family friend
      ☐ Acquaintance (either of yours or of a family member)
      ☐ Stranger
      ☐ Other, please specify _____
i. How emotionally close were you to the assailant prior to the event?
   Not at all close   Extremely close
         1   2   3   4   5   6   7
j. Check all categories that describe the experience . . .
      ☐ physical abuse
      ☐ there was sexual penetration of the mouth, anus, or vagina
      ☐ there was no sexual penetration, but the assailant attempted to force you to complete such an act
      ☐ there was some other form of sexual contact e.g., touched your sexual organs, or forced you to touch assailant's sexual organs
      ☐ no sexual contact occurred, however, the assailant attempted to touch your sexual organs, or make you touch his/her sexual organs

No Yes 6. <u>**As an adult,**</u> **have you had any unwanted sexual experiences that involved the threat or use of force?**

    a. How many times? once ☐   twice ☐   three + ☐
    b. How old were you at that time(s)? 1st____ 2nd____ 3rd____
    c. Were you injured?
        Not at all   Severely
          1   2   3   4   5   6   7
    d. Did you feel your life was threatened?
        Not at all   Extremely
          1   2   3   4   5   6   7
    e. How traumatic <u>**was**</u> this for you at that time?
        Not at all   Extremely
          1   2   3   4   5   6   7
    f. How traumatic <u>**is**</u> this for you now?
        Not at all   Extremely
          1   2   3   4   5   6   7
    g. Was the assailant male or female? Male ☐ Female ☐ Both ☐
    h. What was your relationship to the assailant?
        ☐ Relative
                Please specify the relationship (e.g., sibling, cousin, etc.). _____
        ☐ Friend
        ☐ Acquaintance
        ☐ Stranger
        ☐ Dating partner
        ☐ Other, please specify _____
    i. How emotionally close were you to the assailant prior to the event?
        Not at all close   Extremely close
            1   2   3   4   5   6   7

    j. Check (√) all categories that describe the experience . . .
        ☐ there was sexual penetration of the mouth, anus, or vagina
        ☐ there was no sexual penetration, but the assailant
          attempted to force you to complete such an act
        ☐ there was some other form of sexual contact e.g., touched
          your sexual organs, or forced you to touch assailant's sexual organ
        ☐ no sexual contact occurred, however, the assailant attempted to
          touch your sexual organs, or make you touch his/her sexual organs
    k. Was alcohol or a recreational drug a factor in this event? Indicate your answers below.
        I was intoxicated
        Not at all   A lot
          1   2   3   4   5   6   7
        The offender was intoxicated
         Not at all   A lot
          1   2   3   4   5   6   7   ☐ Don't know
    i. Do you believe you were drugged (i.e., the "date rape drug")?   ☐ yes ☐ no ☐ not sure

No Yes 7. **Have you witnessed someone who was mutilated, seriously injured,**
or violently killed?

      a. How many times? once ☐   twice ☐   three + ☐

      b. How old were you at that time(s)? 1st____ 2nd____ 3rd____

      c. Were you injured?

          Not at all   Severely

             1   2   3   4   5   6   7

      d. Did you feel your life was threatened?

          Not at all   Extremely

             1   2   3   4   5   6   7

      e. How traumatic **was** this for you at that time?

          Not at all   Extremely

             1   2   3   4   5   6   7

      f. How traumatic **is** this for you now?

          Not at all   Extremely

             1   2   3   4   5   6   7

      g. Was alcohol or a recreational drug a factor in this event? Indicate your answers below.

          I was intoxicated

          Not at all   A lot

           1   2   3   4   5   6   7

          The offender was intoxicated

          Not at all   A lot

           1   2   3   4   5   6   7   ☐ Don't know

No Yes 8. **As an adult, have you ever been in a relationship in which you were abused**
either physically or sexually?

      a. How old were you when it began? _____

      b. How old were you when it ended? _____

      c. Were you injured?

          Not at all   Severely

            1   2   3   4   5   6   7

      d. Did you feel your life was threatened?

          Not at all   Extremely

            1   2   3   4   5   6   7

      e. How traumatic **was** this for you at that time?

          Not at all   Extremely

            1   2   3   4   5   6   7

      f. How traumatic **is** this for you now?

          Not at all   Extremely

           1   2   3   4   5   6   7

      g. What was your relationship to the perpetrator?

          ☐ Dating partner

          ☐ Spouse

          ☐ Other, please specify _____

      h. How emotionally close were you to the assailant prior to the event?

          Not at all close   Extremely close

           1   2   3   4   5   6   7

      i. Was alcohol or a recreational drug a factor in this/these event/s? Indicate your answers below.

          I was intoxicated

          Not at all   A lot of the times

           1   2   3   4   5   6   7

          The offender was intoxicated

          Not at all   A lot of the times

           1   2   3   4   5   6   7   ☐ Don't know

No Yes **9. Have you ever had any other <u>very traumatic</u> event like these (e.g., almost drowning, suicide attempt, serious illness, surgery, miscarriage, abortion, combat experience, kidnapping, getting attacked by an animal, being a refugee)?**

> a. How many times? once ☐   twice ☐   three + ☐
> b. How old were you at that time(s)? 1st____ 2nd____ 3rd____
> c. Were you injured?
>   Not at all   Severely
>   1   2   3   4   5   6   7
> d. Did you feel your life was threatened?
>   Not at all   Extremely
>   1   2   3   4   5   6   7
> e. How traumatic <u>**was**</u> this for you at that time?
>   Not at all   Extremely
>   1   2   3   4   5   6   7
> f. How traumatic <u>**is**</u> this for you now?
>   Not at all   Extremely
>   1   2   3   4   5   6   7
> g. What was the event? _____
> h. Was alcohol or a recreational drug a factor in this event? Indicate your answers below.
>   I was intoxicated
>   Not at all   A lot
>   1   2   3   4   5   6   7
>   The offender was intoxicated
>   Not at all   A lot
>   1   2   3   4   5   6   7   ☐ Don't know   ☐ Not applicable

10 . <u>If you answered "No" to all questions</u>, or if <u>**none of the events you listed was very traumatic for you,**</u> please describe briefly the most traumatic thing to happen to you. To help you remember, on the next page, we have included a list of events that some people find very stressful. You may endorse something from this list or identify an event not listed that was your most stressful experience. What was the event?

_____

> a. How many times? once ☐   twice ☐   three + ☐
> b. How old were you at that time(s)? 1st___ 2nd___ 3rd___
> c. Were you injured?
>   Not at all   Severely
>   1   2   3   4   5   6   7
> d. Did you feel your life was threatened?
>   Not at all   Extremely
>   1   2   3   4   5   6   7
> e. How traumatic <u>**was**</u> this for you at that time?
>   Not at all   Extremely
>   1   2   3   4   5   6   7
> f. How traumatic <u>**is**</u> this for you now?
>   Not at all   Extremely
>   1   2   3   4   5   6   7
> g. Was alcohol or a recreational drug a factor in this event? Indicate your answers below.
> `   I was intoxicated
>   Not at all   A lot
>   1   2   3   4   5   6   7
>   The offender was intoxicated
>   Not at all   A lot
>   1   2   3   4   5   6   7   ☐ Don't know   ☐ Not applicable

List of Stressful Experiences

This list is to be used in conjunction with item #10. If none of the events listed previously on the

TEQ was very traumatic for you or if you did not experience any of those events, please use this

list as a guide to help you identify your most stressful experience to write in item #10.

Parents' divorce

Serious financial problems

Breaking a limb

Experiencing verbal abuse

Moving to a new place to live

Breaking up with somebody

A relative or other person dying even though it was expected (e.g., from cancer, a heart attack or stroke at a late age)

Failing a class

Getting arrested

Getting pulled over by a police officer when driving

Getting in a physical altercation with somebody

Getting lost somewhere

Having no place to live

Getting into a minor traffic accident

Finding out that your romantic partner cheated on you

Being diagnosed with a sexually transmitted disease (STD)

Being fired or laid off from a job

Entering a romantic relationship that is not approved by your parents

No Yes 11. If you answered "Yes" to one or more of the questions above, which was the **MOST** traumatic thing to have happened to you? Fill in the number of the question (e.g., #1 for accident,).

_____

Did you answer **Yes** to more than one question above while thinking about the same event?
Yes ☐ No ☐   If yes, which items refer to the same event? _____

12. To be sure that you indicated a _most_ traumatic event, please write the event that was you _most traumatic_ here:

_____

Now answer both #13 and #14 based on the most traumatic event that you indicated in #12.

13. Thinking of the _most traumatic_ event you indicated above, try to remember how you felt when it was happening. If it happened more than once or over a long period, remember how you felt at the worst instance.
a. How afraid were you at the time?
     Not at all   Extremely
        1   2   3   4   5   6   7
b. How helpless did you feel at the time?
     Not at all   Extremely
        1   2   3   4   5   6   7
c. How much horror did you feel at the time?
     None   Extreme
        1   2   3   4   5   6   7
d. How much anger did you feel at the time?
     None   Extreme
        1   2   3   4   5   6   7
e. How much shock (or numbness) did you feel at the time?
     None   Extreme
        1   2   3   4   5   6   7
f. How much shame or guilt did you feel at the time?
     None   Extreme
        1   2   3   4   5   6   7
g. How well do you remember this event?
     Not well at all   Very well
        1   2   3   4   5   6   7

14. Again thinking of the most traumatic experience you endorsed, please rate the level of support you felt at the time and now. Support may include assistance in any of the following areas: physical, emotional, spiritual, financial/material, transportation-related, and any other form of support you may have received. Support may have been provided by family members and relatives, friends or acquaintances, neighbors, community members, medical personnel, law enforcement officers, clergy, mental health professionals, or others.
a. How much support do you feel was *available* at the time of the event or shortly afterward?
     None   A great deal
        1   2   3   4   5   6   7
b. How much support do you feel that you *received* at the time of the event or shortly afterward?
     None   A great deal
        1   2   3   4   5   6   7
c. How *helpful* was the support your received at the time of the event or shortly afterward?
     Not helpful   Very helpful
        1   2   3   4   5   6   7
d. How much support do you currently receive related to this event?
     None   A great deal
        1   2   3   4   5   6   7

Appendix C

Posttraumatic Stress Disorder Checklist – Civilian

INSTRUCTIONS TO STUDENT: Below is a list of problems and complaints that people sometimes have in response to stressful experiences. Please read each one carefully, and blacken the circle to indicate how much you have been bothered by that problem *in the last month*. **Please answer these questions keeping in mind the experience that you indicated on the previous questionnaire to be your <u>most traumatic</u> experience.**

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

Appendix D

Penn State Worry Questionnaire

Please rate the following statements according to how true they are for you. Use the following scale:

1 – not at all typical of me
2 – a little bit typical of me
3 – moderately typical of me
4 – fairly typical of me
5 – very typical of me

1.	If I do not have enough time to do everything, I do not worry about it.*	1	2	3	4	5
2.	My worries overwhelm me.	1	2	3	4	5
3.	I do not tend to worry about things. *	1	2	3	4	5
4.	Many situations make me worry.	1	2	3	4	5
5.	I know I should not worry about things, but I just cannot help it.	1	2	3	4	5
6.	When I am under pressure I worry a lot.	1	2	3	4	5
7.	I am always worrying about something.	1	2	3	4	5
8.	I find it easy to dismiss worrisome thoughts.*	1	2	3	4	5
9.	As soon as I finish one task, I start to worry about everything else I have to do.	1	2	3	4	5
10.	I never worry about anything.*	1	2	3	4	5
11.	When there is nothing more I can do about a concern, I do not worry about it any more.*	1	2	3	4	5
12.	I have been a worrier all my life.	1	2	3	4	5
13.	I notice that I have been worrying about things.	1	2	3	4	5
14.	Once I start worrying, I cannot stop.	1	2	3	4	5
15.	I worry all the time.	1	2	3	4	5
16.	I worry about projects until they are all done.	1	2	3	4	5

Appendix E

White Bear Suppression Inventory

This survey is about thoughts. There are no right or wrong answers, so please respond honestly to each of the items below. As you read through the following statements, record whether you

> **A** - *Strongly Disagree*
> **B** - *Disagree*
> **C** - *Neutral or Don't Know*
> **D** - *Agree*
> **E** - *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.

Appendix F

Acceptance and Action Questionnaire

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 Rarely    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.*   1   2   3   4   5   6   7

2. I often catch myself daydreaming about things I've done and what I would do differently next time.   1   2   3   4   5   6   7

3. When I feel depressed or anxious, I am unable to take care of my responsibilities.   1   2   3   4   5   6   7

4. I rarely worry about getting my anxieties, worries, and feelings under control.*   1   2   3   4   5   6   7

5. I'm not afraid of my feelings.*   1   2   3   4   5   6   7

6. When I evaluate something negatively, I usually recognize that this is just a reaction, not an objective fact.*   1   2   3   4   5   6   7

7. When I compare myself to other people, it seems that most of them are handling their lives better than I do.   1   2   3   4   5   6   7

8. Anxiety is bad.   1   2   3   4   5   6   7

9. If I could magically remove all the painful experiences I've had in my life, I would do so.   1   2   3   4   5   6   7

Appendix G

Posttraumatic Growth Inventory

Indicate for each of the statements below the degree to which this change occurred in your life as a result of the **worst experience you indicated on the Traumatic Events Questionnaire**, using the following scale.

0 – I did not experience this change as a result of my crisis.
1 – I experienced this change to a *very small* degree as a result of my crisis.
2 – I experienced this change to a *small* degree as a result of my crisis.
3 – I experienced this change to a *moderate* degree as a result of my crisis.
4 – I experienced this change to a *great* degree as a result of my crisis.
5 – I experienced this change to a *very great* degree as a result of my crisis.

As a result of my crisis, I experienced a change in:

1. My priorities about what is important in life.	0	1	2	3	4	5
2. An appreciation for the value of my own life.	0	1	2	3	4	5
3. I developed new interests.	0	1	2	3	4	5
4. A feeling of self-reliance.	0	1	2	3	4	5
5. A better understanding of spiritual matters.	0	1	2	3	4	5
6. Knowing that I can count on people in times of trouble.	0	1	2	3	4	5
7. I established a new path for my life.	0	1	2	3	4	5
8. A sense of closeness with others.	0	1	2	3	4	5
9. A willingness to express my emotions.	0	1	2	3	4	5
10. Knowing I can handle difficulties.	0	1	2	3	4	5
11. I'm able to do better things with my life.	0	1	2	3	4	5
12. Being able to accept the way things work out.	0	1	2	3	4	5
13. Appreciating each day.	0	1	2	3	4	5
14. New opportunities are available which wouldn't have been otherwise.	0	1	2	3	4	5
15. Having compassion for others.	0	1	2	3	4	5
16. Putting effort into my relationships.	0	1	2	3	4	5
17. I'm more likely to try to change things which need changing.	0	1	2	3	4	5
18. I have a stronger religious faith.	0	1	2	3	4	5
19. I discovered that I'm stronger than I thought I was.	0	1	2	3	4	5
20. I learned a great deal about how wonderful people are.	0	1	2	3	4	5
21. I accept needing others.	0	1	2	3	4	5

Appendix H

Posttraumatic Cognitions Inventory

We are interested in the kind of thoughts which you may have had after a traumatic experience. **Answer these items based on your thoughts about the worst experience you indicated on the Traumatic Events Questionnaire.** Below are a number of statements that may or may not be representative of your thinking. Please read each statement carefully and tell us how much you AGREE or DISAGREE with each statement. People react to traumatic events in many different ways. There are no right or wrong answers to these statements.

1	Totally disagree
2	Disagree very much
3	Disagree slightly
4	Neutral
5	Agree slightly
6	Agree very much
7	Totally agree

1. The event happened because of the way I acted.
    1   2   3   4   5   6   7
2. I can't trust that I will do the right thing.
    1   2   3   4   5   6   7
3. I am a weak person.
    1   2   3   4   5   6   7
4. I will not be able to control my anger and will do something terrible.
    1   2   3   4   5   6   7
5. I can't deal with even the slightest upset.
    1   2   3   4   5   6   7
6. I used to be a happy person but now I am always miserable.
    1   2   3   4   5   6   7
7. People can't be trusted.
    1   2   3   4   5   6   7
8. I have to be on guard all the time.
    1   2   3   4   5   6   7
9. I feel dead inside.
    1   2   3   4   5   6   7
10. You can never know who will harm you.
    1   2   3   4   5   6   7
11. I have to be especially careful because you never know what will happen next.
    1   2   3   4   5   6   7
12. I am inadequate.
    1   2   3   4   5   6   7
13. I will not be able to control my emotions, and something terrible will happen. *
    1   2   3   4   5   6   7
14. If I think about the event, I will not be able to handle it.
    1   2   3   4   5   6   7
15. The event happened to me because of the sort of person I am.
    1   2   3   4   5   6   7
16. My reactions since the event mean that I am going crazy.
    1   2   3   4   5   6   7
17. I will never be able to feel normal emotions again.
    1   2   3   4   5   6   7
18. The world is a dangerous place.
    1   2   3   4   5   6   7

19. Somebody else would have stopped the event from happening.
      1   2   3   4   5   6   7

20. I have permanently changed for the worse.
      1   2   3   4   5   6   7

21. I feel like an object, not like a person.
      1   2   3   4   5   6   7

22. Somebody else would not have gotten into this situation.
      1   2   3   4   5   6   7

23. I can't rely on other people.
      1   2   3   4   5   6   7

24. I feel isolated and set apart from others.
      1   2   3   4   5   6   7

25. I have no future.
      1   2   3   4   5   6   7

26. I can't stop bad things from happening to me.
      1   2   3   4   5   6   7

27. People are not what they seem.
      1   2   3   4   5   6   7

28. My life has been destroyed by the trauma.
      1   2   3   4   5   6   7

29. There is something wrong with me as a person.
      1   2   3   4   5   6   7

30. My reactions since the event show that I am a lousy coper.
      1   2   3   4   5   6   7

31. There is something about me that made the event happen.
      1   2   3   4   5   6   7

32. I will not be able to tolerate my thoughts about the event, and I will fall apart.*
      1   2   3   4   5   6   7

33. I feel like I don't know myself anymore.
      1   2   3   4   5   6   7

34. You never know when something terrible will happen.*
      1   2   3   4   5   6   7

35. I can't rely on myself.
      1   2   3   4   5   6   7

36. Nothing good can happen to me anymore.
      1   2   3   4   5   6   7

Appendix I

Dispositional Resilience Index

Below are statements about life that people often feel differently about. Circle a number to show how you feel about each one. Read the items carefully and indicate how much you think each one is true in general. There are no right or wrong answers; just give your own honest opinions.

Not at all true = 0
A little true = 1
Quite true = 2
Completely true = 3

1. Most of my life gets spent doing things that are worthwhile.	0	1	2	3
2. Planning ahead can help avoid most future problems.	0	1	2	3
3. No matter how hard I try, my efforts usually accomplish nothing.*	0	1	2	3
4. I don't like to make changes in my everyday schedule.*	0	1	2	3
5. The "tried and true" ways are always best.*	0	1	2	3
6. Working hard doesn't matter, since only the bosses profit by it.*	0	1	2	3
7. By working hard you can always achieve your goals.	0	1	2	3
8. Most of what happens in life is just meant to be.*	0	1	2	3
9. When I make plans, I'm certain I can make them work.	0	1	2	3
10. It's exciting to learn something about myself.	0	1	2	3
11. I really look forward to my work.	0	1	2	3
12. If I'm working on a difficult task, I know when to seek help.	0	1	2	3
13. I won't answer a question until I'm really sure I understand it.*	0	1	2	3
14. I like a lot of variety in my work.	0	1	2	3
15. Most of the time, people listen carefully to what I say.	0	1	2	3
16. Thinking of yourself as a free person just leads to frustration.*	0	1	2	3
17. Trying your best at work really pays off in the end.	0	1	2	3
18. My mistakes are usually very difficult to correct.*	0	1	2	3
19. It bothers me when my daily routine gets interrupted.*	0	1	2	3
20. Most good athletes and leaders are born, not made.*	0	1	2	3
21. I often wake up eager to take up my life wherever it left off.	0	1	2	3
22. Lots of times, I don't really know my own mind.*	0	1	2	3

23. I respect rules because they guide me.*   0   1   2   3

24. I like it when things are uncertain or unpredictable.   0   1   2   3

25. I can't do much to prevent it if someone wants to harm me.*   0   1   2   3

26. Changes in routine are interesting to me.   0   1   2   3

27. Most days, life is really interesting and exciting for me.   0   1   2   3

28. It's hard to imagine anyone getting excited about working.* 0   1   2   3

29. What happens to me tomorrow depends on what I do today. 0   1   2   3

30. Ordinary work is just too boring to be worth doing.*   0   1   2   3

Appendix J

Self-efficacy Scale

Please indicate how much you agree with the following statements by marking the scale below each item.

1. When I make plans, I am certain I can make them work.

   1   2   3   4   5   6   7   8   9   10   11   12   13   14
   strongly   strongly
   disagree   agree

2. One of my problems is that I cannot get down to work when I should.*

   1   2   3   4   5   6   7   8   9   10   11   12   13   14
   strongly   strongly
   disagree   agree

3. If I can't do a job the first time, I keep trying until I can.

   1   2   3   4   5   6   7   8   9   10   11   12   13   14
   strongly   strongly
   disagree   agree

4. When I set important goals for myself, I rarely achieve them.*

   1   2   3   4   5   6   7   8   9   10   11   12   13   14
   strongly   strongly
   disagree   agree

5. I give up on things before completing them.*

   1   2   3   4   5   6   7   8   9   10   11   12   13   14
   strongly   strongly
   disagree   agree

6. I avoid facing difficulties.*

   1   2   3   4   5   6   7   8   9   10   11   12   13   14
   strongly   strongly
   disagree   agree

7. If something looks too complicated, I will not even bother to try it.*

   1   2   3   4   5   6   7   8   9   10   11   12   13   14
   strongly   strongly
   disagree   agree

8. When I have something unpleasant to do, I stick to it until I finish it.

   1   2   3   4   5   6   7   8   9   10   11   12   13   14
   strongly   strongly
   disagree   agree

9. When I decide to do something, I go right to work on it.

   1   2   3   4   5   6   7   8   9   10   11   12   13   14
   strongly   strongly
   disagree   agree

10. When trying to learn something new, I soon give up if I am not initially successful.*

    1   2   3   4   5   6   7   8   9   10   11   12   13   14
    strongly   strongly
    disagree   agree

11. When unexpected problems occur, I don't handle them well.*
    1   2   3   4   5   6   7   8   9   10   11   12   13   14
    strongly   strongly
    disagree   agree

12. I avoid trying to learn new things when they look too difficult for me.*
    1   2   3   4   5   6   7   8   9   10   11   12   13   14
    strongly   strongly
    disagree   agree

13. Failure just makes me try harder.
    1   2   3   4   5   6   7   8   9   10   11   12   13   14
    strongly   strongly
    disagree   agree

14. I feel insecure about my ability to do things.*
    1   2   3   4   5   6   7   8   9   10   11   12   13   14
    strongly   strongly
    disagree   agree

15. I am a self-reliant person.
    1   2   3   4   5   6   7   8   9   10   11   12   13   14
    strongly   strongly
    disagree   agree

16. I give up easily.*
    1   2   3   4   5   6   7   8   9   10   11   12   13   14
    strongly   strongly
    disagree   agree

17. I do not seem capable of dealing with most problems that come up in life.*
    1   2   3   4   5   6   7   8   9   10   11   12   13   14
    strongly   strongly
    disagree   agree

18. It is difficult for me to make new friends.*
    1   2   3   4   5   6   7   8   9   10   11   12   13   14
    strongly   strongly
    disagree   agree

19. If I see someone I would like to meet, I go to that person instead of waiting for him or her to come to me.
    1   2   3   4   5   6   7   8   9   10   11   12   13   14
    strongly   strongly
    disagree   agree

20. If I meet someone interesting who is hard to make friends with, I'll soon stop trying to make friends with that person.*
   1   2   3   4   5   6   7   8   9   10   11   12   13   14
    strongly   strongly
    disagree   agree

21. When I'm trying to become friends with someone who seems uninterested at first, I don't give up easily.
    1   2   3   4   5   6   7   8   9   10   11   12   13   14
    strongly   strongly
    disagree   agree

22. I do not handle myself well in social gatherings.*
    1   2   3   4   5   6   7   8   9   10   11   12   13   14
    strongly   strongly
    disagree   agree

23. I have acquired my friends through my personal abilities at making friends.

1   2   3   4   5   6   7   8   9   10   11   12   13   14

strongly   strongly

disagree   agree

Appendix K

Coping Self-Efficacy Scale

When things aren't going well for you, or when you're having problems, how confident or certain are you that you can do the following:

Cannot do at all					Moderately certain can do					Certain can do
0	1	2	3	4	5	6	7	8	9	10
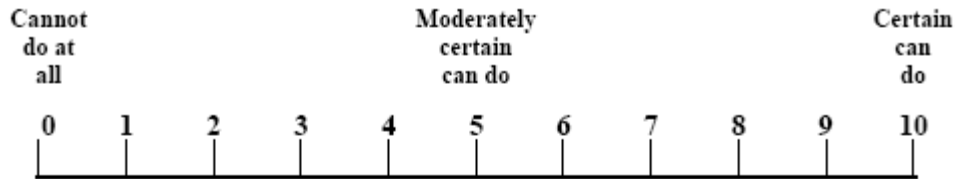
For each of the following items, write a number from 0 - 10, using the scale above.

When things aren't going well for you, how confident are you that you can:

1.   Keep from getting down in the dumps.   _____

2.   Talk positively to yourself.   _____

3.   Sort out what can be changed, and what can not be changed.   _____

4.   Get emotional support from friends and family.   _____

5.   Find solutions to your most difficult problems.   _____

6.   Break an upsetting problem down into smaller parts.   _____

7.   Leave options open when things get stressful.   _____

8.   Make a plan of action and follow it when confronted with a problem.   _____

9.   Develop new hobbies or recreations.   _____

10.   Take your mind off unpleasant thoughts.   _____

---

11.   Look for something good in a negative situation.   _____

12.   Keep from feeling sad.   _____

13.   See things from the other person's point of view during a heated argument.   _____

14.   Try other solutions to your problems if your first solutions don't work.   _____

15.   Stop yourself from being upset by unpleasant thoughts.   _____

please go on to next page

When things aren't going well for you, or when you're having problems, how confident or certain are you that you can do the following:

Cannot do at all				Moderately certain can do				Certain can do
0	1	2	3	4	5	6	7	8	9	10
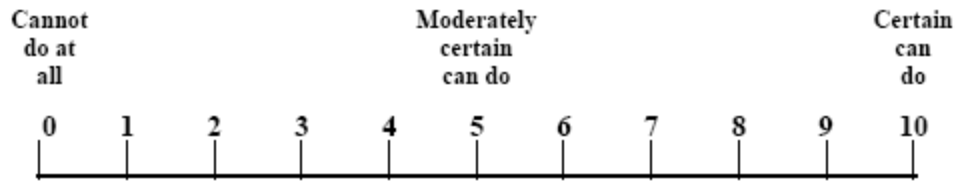
When things aren't going well for you, how confident are you that you can:

16.   Make new friends.   _____

17.   Get friends to help you with the things you need.   _____

18.   Do something positive for yourself when you are feeling discouraged.   _____

19.   Make unpleasant thoughts go away.   _____

20.   Think about one part of the problem at a time.   _____

_____

21.   Visualize a pleasant activity or place.   _____

22.   Keep yourself from feeling lonely.   _____

23.   Pray or meditate.   _____

24.   Get emotional support from community organizations or resources.   _____

25.   Stand your ground and fight for what you want.   _____

26.   Resist the impulse to act hastily when under pressure.   _____

Appendix L

Anxiety Control Questionnaire

Listed below are a number of statements describing a set of beliefs. Please read each statement carefully, and, on the 0-5 scale given, indicate how much you think *each* statement is typical of *you*.

0-------------------1-------------------2-------------------3-------------------4-------------------5

| Strongly Disagree | Moderately Disagree | Slightly Disagree | Slightly Agree | Moderately Agree | Strongly Agree |

_____ 1. I am usually able to avoid threat quite easily.

_____ 2. How well I cope with difficult situations depends on whether I have outside help.*

_____ 3. When I am put under stress, I am likely to lose control.*

_____ 4. I can usually stop my anxiety from showing.

_____ 5. When I am frightened by something, there is generally nothing I can do.*

_____ 6. My emotions seem to have a life of their own.*

_____ 7. There is little I can do to influence people's judgments of me.*

_____ 8. Whether I can successfully escape a frightening situation is always a matter of chance with me. *

_____ 9. I often shake uncontrollably.*

_____ 10. I can usually put worrisome thoughts out of my mind easily.

_____ 11. When I am in a stressful situation, I am able to stop myself from breathing too hard.

_____ 12. I can usually influence the degree to which a situation is potentially threatening to me.

_____ 13. I am able to control my level of anxiety.

_____ 14. There is little I can do to change frightening events.*

_____ 15. The extent to which a difficult situation resolves itself has nothing to do with my actions. *

_____ 16. If something is going to hurt me, it will happen no matter what I do.*

_____ 17. I can usually relax when I want.

_____ 18. When I am under stress, I am not always sure how I will react.*

_____ 19. I can usually make sure people like me if I work at it.

_____ 20. Most events that make me anxious are outside my control.*

_____ 21. I always know exactly how I will react to difficult situations.

_____ 22. I am unconcerned if I become anxious in a difficult situation, because I am confident in my ability to cope with my symptoms.

_____ 23. What people think of me is largely outside my control.*

_____ 24. I usually find it hard to deal with difficult problems.*

_____ 25. When I hear that someone has a serious illness, I worry that I am next.*

_____ 26. When I am anxious, I find it difficult to focus on anything other than my anxiety.*

_____ 27. I am able to cope as effectively with unexpected anxiety as I am with anxiety that I expect to occur.

_____ 28. I sometimes think, "Why even bother to try to cope with my anxiety when nothing I do seems to affect how frequently or intensely I experience it?"*

_____ 29. I often have the ability to get along with "difficult" people.

_____ 30. I will avoid conflict due to my inability to successfully resolve it.*

Appendix M

Informed Consent Form

Project Title: Predictors of PTSD Symptoms for Criterion A Events and Nonqualifying Events

Investigator: Sarah Reiland, M.S., Eastern Michigan University
Co-Investigator: Dean Lauterbach, Ph.D., Professor of Psychology at Eastern Michigan
            University

1.   **Purpose Of The Study:** The purpose of the study is to investigate factors that contribute to the perception of an event as stressful.

2.   **Procedure:** A research assistant will explain the study to you, answer any questions you may have, and witness your signature to this consent form. You must be at least 18-years-old to take part in this study.

      You will be asked to complete twelve brief questionnaires: a demographic questionnaire, a life events questionnaire, several measures of your responses to stressful life events, and several questionnaires about your beliefs about yourself and others.

      Upon completing the questionnaires, you will be given a duplicate copy of the informed consent, which includes follow-up contact information, if needed. The approximate total time to complete the questionnaires should be about 60 minutes.

3.   **Confidentiality:** Only a code number will identify your questionnaire responses. The results will be stored separately from the consent form, which includes your name and any other identifying information. At no time will your name be associated with your responses to the questionnaires.

      All information will be kept in locked file cabinets of the study investigator.

4.   **Expected Risks:** There are no forseeable risks to you by completing the questionnaires. Some questions ask about traumatic events you have experienced, and it is possible that these questions may elicit an emotional reaction from you.

5.   **Expected Benefits Of The Study:** Your participation will help our understanding of trauma and other forms of stress and their effects. This information will help the future treatment of trauma-exposed individuals. If your instructor gives extra credit for research participation, you may receive extra credit in one of your psychology classes for your participation. The amount of extra credit to be earned, if any, will be decided by your instructor.

6. **Voluntary Participation:** Participation in this study is voluntary. You may choose not to participate. If you do decide to participate, you can change your mind at any time and withdraw from the study without negative consequences.

7. **Use of Research Results:** Results will be presented in aggregate form only. No names or individually identifying information will be revealed. Results may be presented at research meetings and conferences, in scientific publications, and as part of a doctoral dissertation being conducted by the principal investigator.

8. **Future Questions**: If you have any questions concerning your participation in this study now or in the future, you can contact the principal investigator, Sarah Reiland, at 734-487-1155 (main psychology department office) or via e-mail at sreiland@emich.edu.

This research protocol and informed consent document have been reviewed and approved by the Eastern Michigan University Human Subjects Review Committee for use from _____ to _____. If you have questions about the approval process, please contact Dr. Deb de Laski-Smith, Interim Dean of the Graduate School and Administrative Co-Chair of UHSCR (734-487-0042, human.subjects@emich.edu)

Consent to Participate: I have read or have read to me all of the above information about this research study, including the research procedures, possible risks, side effects, and the likelihood of any benefit to me. The content and meaning of this information has been explained, and I understand. All my questions, at this time, have been answered. I hereby consent and do voluntarily offer to follow the study requirements and take part in the study.

In the event that I experience emotional reactions that are difficult for me to manage, I understand that the investigator or her assistants may contact a clinical supervisor for consultation and that a referral to a mental health agency, or notification of my condition to the staff at Snow Counseling Center, may be made. I also understand that I should notify the investigator or her assistants if I am having significant emotional distress in response to participation in the study. I understand that I can also receive free psychological counseling at Snow Health Center (734-487-1118) if I am a student or low-cost therapy at the EMU Psychology Clinic (734-487-4987).

PRINT NAME: _____

Signatures

_____   _____
Participant (your signature)   Date

_____   _____
Investigator or Specified Designee   Date

Appendix N

Informed Consent Script

My name is Sarah Reiland, and I am the principal investigator for a study looking at exposure to traumatic events and your thoughts about these events. There are twelve questionnaires that you will complete as part of the study. Eleven are very short, and one is of moderate length. It will probably take 45 to 60 minutes to complete all questionnaires. Before you complete the questionnaires, there is an informed consent form for you to read and sign. I am passing out two copies: one is for you to sign and turn in to me, and the other is for you to keep for your records. As you are reading this form, I will explain its contents.

Some questions inquire about traumatic events you may have experienced, which may cause you discomfort. You have the right to discontinue the study anytime without penalty. All your responses are confidential. Your identifying information will be destroyed after we collect the questionnaires. Your participation in the study will contribute to our understanding of the effects of traumatic experiences and other stressful experiences. If you are interested in a copy of the results, write your contact information on the informed consent form, and it will be provided to you after the study has been completed.

Thank you.

Appendix O

Breslau & Kessler's (2001) list of 19 events that meet criterion A1

Military combat
Rape
Held captive/tortured/kidnapped
Shot/stabbed
Sexual assault other than rape
Mugged/threatened with weapon
Badly beaten
Serious car accident
Other serious accident
Natural disaster
Life-threatening illness
Child's life-threatening illness
Witness killing/serious injuries
Discovered dead body
Learning of the rape or sexual assault of someone close
Learning that someone close was seriously attacked
Learning that someone close experienced a serious car accident
Learning that someone close experienced another kind of serious accident
Learning of the sudden unexpected death of someone close