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IN POSTTRAUMATIC STRESS DISORDER

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Expanding the Role of Criterion A2 in Posttraumatic Stress Disorder

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Posttraumatic stress disorder is a psychiatric construct that refers to symptoms that may follow exposure to a traumatic event. The current definition of a traumatic event differentiates between the objective event, criterion A1, and an individual's subjective response, criterion A2. This study investigated the importance of criterion A2 and other intense negative emotions in the development of PTSD. Self-report measures were used to determine the presence or absence of the event criteria A1 and A2, PTSD symptoms, and intensity of emotion type at the time of an event. Criterion A2 emotions at the time of the event were associated with higher levels of PTSD symptoms regardless of the presence or absence of an A1 event. Consistent with previous literature, non-criteria A1 events were associated with higher ratings of PTSD symptoms compared to criteria A1 events. Finally, in addition to the peritraumatic emotion of fear, peritraumatic guilt also significantly predicted PTSD symptom intensity.

Posttraumatic Stress Disorder (PTSD) is a psychiatric construct that refers to a specific class of symptoms that result from exposure to a traumatic event. In the Diagnostic and Statistical Manual for Mental Disorders, Fourth Edition Text-Revision (DSM-IV-TR; American Psychiatric Association [APA], 2000) criterion A, required for diagnosis, specifies which events and emotional reactions can precede and lead to the onset of diagnosable PTSD. PTSD diagnoses are thus limited to people exposed to predetermined events (A1) and experiencing emotions specified by the criterion language (A2). Because criterion A plays a gate keeping role in defining the disorder, determining which events and emotional responses are actually associated with PTSD symptoms is an important empirical and theoretical question. This correlational study examines the role of an individual's subjective response related to PTSD symptom intensity.

History and Overview of Posttraumatic Stress Disorder

PTSD is unique among current diagnostic categories in its requiring a non-biological, etiological event to warrant diagnosis. Criterion A, the event criterion, plays an enormous role in the conceptualization of the disorder with regard to its etiology and diagnosis. Thus, achieving a consensus definition of a traumatic event is essential to the field of trauma (Weathers & Keane, 2007). However, agreeing upon a definition has proven problematic throughout consecutive revisions of the DSM. Although the criterion language has changed since its initial conception in DSM-III, the original understanding of a traumatic event has remained the same: a traumatic stressor has to be of a certain magnitude and type to precipitate the PTSD syndrome (Weathers & Keane, 2007).

PTSD was first conceptualized as a diagnostic construct in 1980 in the third edition of the DSM. Although previous editions of the DSM included acute stress syndromes following combat exposure, PTSD was developed in response to growing sentiment within the field that veterans

returning from the Vietnam War were presenting with delayed or chronic psychiatric conditions (Jones & Wessely, 2007). Editors were at first hesitant to include a diagnostic category so heavily tied to an historical event, but they relented when research demonstrated that victims of other events, such as sexual assault, natural disasters or confinement in a concentration camp experienced similar reactions (McNally, 2003). This led to the formulation of a diagnostic category that represented the unique psychiatric presentation of those who experience highly traumatic events.

The DSM-IV-TR, the current edition of the manual, differentiates between the actual event and an individual's subjective experience of that event. Criterion A1 specifies which events can lead to the development of the PTSD syndrome. In order to be diagnosed with PTSD, an individual must have "experienced, witnessed, or been confronted with an event or events that involve actual or threatened death or serious injury, or a threat to the physical integrity of oneself or others" (p. 463: APA, 2000). The language of the DSM emphasizes both the magnitude and type of the event, as individuals must experience an event that poses serious risk to themselves or others. Although the DSM language indicates that individuals who observe a traumatic event may develop the same syndrome as individuals who directly experience an event, researchers have questioned whether these might represent qualitatively distinct experiences associated with different underlying cognitive mechanisms (Alden, Regambal, & Laposa, 2008)

To determine potential differences between directly experiencing and witnessing traumatic events, Alden, Regambal and Laposa (2008) compared nurses who experienced a direct threat to themselves with nurses who witnessed threat to patients. Taken together, both groups showed similar levels of PTSD symptoms; however, the groups differed in regards to their symptom structure and cognitive appraisals of the event. The direct threat group showed a

greater response of fear during the event and presented more PTSD arousal symptoms. The witnessing group was more likely to appraise the event negatively afterwards, which the authors explained as the result of viewing their reactions as reflecting a personal weakness (Alden et al., 2008). This study appears to indicate that an individual's subjective response to an event plays a large role in the development of the disorder, which demonstrates the importance of criterion A2.

Criterion A2 indicates which subjective responses must occur at the time of a criterion A1 event to classify it as traumatic. An individual must experience an event with "intense fear, helplessness or horror" (p. 463: APA, 2000). The inclusion of criterion A2 emphasized the importance of an individual's subjective response to trauma because research findings had suggested that not all individuals who experience traumatic events eventually developed PTSD (Weathers & Keane, 2007). Although other factors, such as gender, perceived support, coping skills, negative self-appraisals and defense mechanisms (i.e. peritraumatic dissociation; Ehlers & Clark, 2000; Karl, Rabe, Zollner, Maercker, & Stopa; Olff, Langeland, Draijer, & Gersons, 2007; Ozer, Best, Lipsey, & Weiss, 2003) may play a role in this process and determine whether or not the person develops symptoms, it is specifically an individual's emotional response to trauma that is as important to the development of DSM PTSD as the actual event.

Prevalence of Trauma Exposure and PTSD

Researching PTSD is important because the prevalence rates of traumatic exposure and of PTSD are high in the United States. Epidemiological studies have shown high prevalence of lifetime exposure to traumatic events and of diagnoses of PTSD across sample settings. For example, in an attempt to determine prevalence rates of various psychiatric illnesses in the U.S., Kessler and colleagues (1995) conducted the National Comorbidity Survey (NCS). The Diagnostic Interview Schedule was administered to a nationally representative group of 5,877

individuals ranging in ages from 15 to 54 to determine prevalence rates of different DSM disorders. The rate of individuals who had experienced at least one criterion A1 event in their lifetimes was 57%. However, the lifetime prevalence rate for PTSD in this sample was much lower, at 7.8%. The authors also found significant differences between men and women with regard to lifetime prevalence rates of PTSD. While men's lifetime prevalence of PTSD was 5.0%, the lifetime prevalence for women was 10.4%. This finding is especially interesting considering that men were more likely to experience a criterion A1 event in their lifetimes at 60% compared to a lifetime event prevalence of 52% for women.

More recently, a replication of the National Comorbidity Survey (NCS-R) was conducted to determine prevalence rates of DSM disorders a decade later (Kessler, Berglund, Demler, Jin, Merikangas, & Walter, 2005). The authors collected a nationally representative sample of 5,692 individuals and administered the World Health Organization Composite International Diagnostic Interview (CIDI), which assesses the presence of both DSM and International Classification of Diseases (ICD) disorders. The authors found similar lifetime prevalence rates of PTSD (6.8%), compared to the original NCS.

Studies using community samples have demonstrated slightly higher prevalence rates of criteria A1 events and PTSD. For example, the 1996 Detroit Area Survey of Trauma sought to determine prevalence rates of criteria A1 events and PTSD using a sample of 2,181 randomly selected participants in the Detroit metropolitan area (Breslau, Kessler, Chilcoat, Schultz, Davis, & Andreski, 1998). Lifetime prevalence rates of criteria A1 events and PTSD were much higher than those previously cited in the NCS and NCS-R. Eighty seven percent of the participants had experienced at least one criteria A1 event, and the conditional probability of developing PTSD after experiencing a criterion A1 event was determined to be 9.2%. Although men were more

likely to experience a criterion A1 event, women were more likely to endorse a criterion A2 response during a criterion A1 event. Because individuals who reported experiencing both a criterion A1 event and criterion A2 response were more likely to develop a PTSD diagnosis (12%), this represents a possible explanation for gender differences related to the development of PTSD (Breslau, Kessler, Chilcoat, Schultz, Davis, & Andreski, 1998).

College students may be at an even greater risk of both experiencing criterion A1 events and developing PTSD or reporting PTSD symptoms. Studies examining prevalence rates of traumatic events and PTSD at various universities have found that prevalence rates are slightly higher than national averages from the NCS and NCS-R (Bernat, Ronfeldt, Calhoun, & Arias, 1998; Frazier, Anders, Perera, Tomich, Tennen, Park & Tashiro, 2009). Using a large sample at a Southern university, Bernat and colleagues (1998) observed that the students' lifetime prevalence rate of experiencing a criterion A1 event was 67%, and the lifetime prevalence rate for developing PTSD was 12.5%. More recently Frazier and colleagues (2009) sampled undergraduate students at four large universities on the East Coast and in the Midwest. In that study 85% of the sample indicated experiencing at least one lifetime criterion A1 event. Furthermore, the probable PTSD prevalence rate based on lifetime exposure was estimated at 6%, which is slightly lower than the national average.

Both studies suggest that college students may be particularly at risk of experiencing criteria A1 events, which makes examining PTSD in this population important. However, these results should be interpreted with caution, as both samples included primarily female students. Data from the original NCS indicated that women compared to men are more likely to experience criterion A1 events, as well as to develop PTSD (Kessler et al., 1995). Given that these college samples heavily represented females, the prevalence rates may be slightly inflated.

In a more representative sample of U.S. college students researchers sought to acquire information regarding the prevalence of adverse life events and PTSD (Smyth, Hockemeyer, Heron, Wonderlich, & Pennebaker, 2008). The sample included 6,053 undergraduate students from different geographical regions and academic settings (public and private institutions), which enhances the generalizability of the findings. From the original sample, 116 participants were randomly selected to determine the presence of PTSD. During telephone interviews, 9% of the participants reported symptoms suggestive of a clinical PTSD diagnosis.

Two issues become pertinent to the study of trauma after reviewing these epidemiological studies. First, although the lifetime prevalence of experiencing a criterion A1 event is high, only a small minority of individuals who experience an A1 event eventually develops PTSD. Based on the DSM criteria for a traumatic event, these findings are not too surprising. Although individuals may experience an objectively defined traumatic event, they are unlikely to develop PTSD unless their experience contains a strong emotional reaction. Once again, although other factors such as individual differences in vulnerability and resilience may contribute to the development of PTSD, research findings suggest that an individual's peritraumatic emotional response plays a large role in this process.

For example, in a meta-analytic review of the literature, Ozer, Best, Lipsey and Weiss (2003) found that peritraumatic emotional processes, including both peritraumatic emotional responding and dissociation, were the strongest predictors of developing PTSD as compared to pre-trauma individual characteristics, such as family history of psychopathology and prior traumatic experiences. Similarly, Brewin, Andrews and Valentine (2000) completed a meta-analytic review of the trauma literature and found that factors during and after a traumatic

experience, such as trauma severity, perceived social support and additional life stressors, had stronger effects than pre-trauma factors.

The second issue relevant to trauma research is that the variability in lifetime exposure rates to traumatic events may be partially due to different definitions of traumatic events among the studies. In order to qualify an event as meeting criterion A1, a researcher or clinician must determine whether an event meets the criterion language, which is a highly subjective process. Researchers have demonstrated that the method used to attain rater agreement on whether an event meets criterion A1 can significantly affect the prevalence estimates for traumatic event exposure (Van Hooff, McFarlane, Baur, Abraham, & Barnes, 2009). Specifically, Van Hoof and colleagues found that prevalence rates differed significantly depending upon whether researchers used a single rater, multiple rater-majority, or multiple rater-unanimous method to determine whether an event should be classified as a criterion A1 event.

Problems with Criterion A1, the Objective Event Criterion

The current definition of criterion A1 restricts the number of events that can be considered potentially traumatic to a short list. As a result, criterion A1 has received a considerable amount of criticism, as events that do not meet the criterion language have also been demonstrated to be associated with the development of PTSD. For example, losing one's livestock to disease appeared to lead to significant levels of PTSD symptoms and distress in Dutch farmers following the foot and mouth disease epidemic in 2001 (Olff, Koeter, Van Haaften, Kerston, & Gersons, 2005). Although no formal diagnoses of PTSD were given in the study, more than half of the 661 Dutch dairy farmers who participated reported levels of PTSD symptoms requiring professional help based on the *Impact of Events Scale – Revised* (Weiss & Marmar, 1995). Other life events that are typically not considered criterion A1 events, but have

been associated with an elevation in PTSD symptoms include marital disruption (Dremin, 1991) and normal childbirth (Czarnocka & Slade, 2000).

Contrary to what would be expected based on the DSM criteria, research has also demonstrated that non-criterion A1 events (also referred to as DSM-incongruent events, life stressors and stressful life events) have been associated with similar or higher rates of PTSD symptoms compared to the rates for criterion A1 events (Gold, Marx, Soler-Baillo, & Sloan, 2005; Long, Elhai, Schweinle, Gray, Grubach, & Frueh, 2008; Mol, Arnzt, Metsemakers, Dinant, Vilters-Van Montfort, et al., 2005; Van Hooff et al., 2009). Researchers in the Netherlands used an open-population sampling method to compare PTSD symptoms in participants whose "worst event" was a criterion A1 event to participants who indicated that their "worst event" was a non-criterion A1 event (Mol et al., 2005). Because all residents of the Netherlands are registered through their primary care physicians, the researchers were able to sample randomly from the entire population. Surprisingly, PTSD scores were significantly higher for individuals who specified that their worst event was a stressful life event, even after statistically controlling for demographic characteristics and history of traumatic events. Furthermore, in the previously discussed study examining the impact of rater reliability for traumatic events on prevalence estimates of PTSD, Van Hooff and colleagues (2009) found that events classified as non-traumatic were associated with elevated rates of PTSD symptoms.

Several studies have reported equivocal findings with regard to differences in PTSD symptom levels following criterion A1 and non-criterion A1 events in college samples. Gold and colleagues (2005) compared participants who selected their "most traumatic event" as DSM-congruent with individuals who selected events that were DSM-incongruent with regard to PTSD symptoms. Participants were given a packet of questionnaires in class and asked to complete

them over the course of a two week period. Four hundred and fifty four participants who returned the questionnaire packet were included in the study. Once again, individuals who selected DSM-incongruent events reported small but significantly higher levels of PTSD symptoms than those selecting DSM-congruent events.

Long et al (2008) attempted to evaluate and possibly refute the findings of Gold et al. (2005) through the use of stronger methodology and design. The authors anticipated that including a counterbalanced, repeated measures design to control for trauma history and order effects would result in opposite findings. Participants were asked to complete the *Stressful Life Events Screening Questionnaire* (Goodman, Corcoran, Turner, Yuan & Green, 1998) and *Life Event Survey* (Sarason, Johnson & Siegal, 1978) to determine their history of criterion A1 events and non-A1 stressful life events, respectively. Participants completed a measure assessing current PTSD symptoms after completing each event questionnaire. The authors found an order effect, in that stressful life events were only associated with higher levels of PTSD symptoms if participants responded to the stressful life events measure before indicating Criterion A1 events.

More recently, Lancaster, Melka and Rodriguez (2009) attempted to replicate the previous findings suggesting that stressful life events are associated with slightly higher rates of PTSD symptoms in college students (Gold et al., 2005; Long et al., 2008). Their design differed from the previous literature in that the researchers statistically controlled for depression, current affect, and social anxiety. After controlling for these three variables, the authors found no significant differences between the criterion A1 group and the life stressors group. However, the researchers did find statistically significant differences between individuals who experienced interpersonal criteria A1 events (e.g. sexual and physical assault) compared to those who experienced a non-interpersonal event (e.g. natural disasters).

Cameron, Palm and Follette (2010) also examined differences in potential PTSD diagnoses and symptom severity between individuals whose "most stressful event" was classified as a criterion A1 or as a non-A1 event. The *PTSD Checklist – Specific* (Blanchard, Jones-Alexander, Buckley & Forneris, 1996) was used to assess current symptoms of PTSD related to each participant's most stressful event. Scores above 40 were considered indicative of a potential diagnosis of PTSD. A *chi-squared* test indicated that participants whose most stressful event was classified as an A1 event were more likely to have a potential PTSD diagnosis. However, there were no differences between the groups in regard PTSD symptom severity after controlling for time since the event and current distress.

A major limitation of the research that compares stressful life events to criterion A1 events is that researchers do not truly differentiate between traumatic events and stressful life events. According to the DSM-IV-TR, a traumatic event must meet both the objective criterion (A1) as well as the subjective criterion (A2). Because these studies did not measure participants' subjective response to criterion A1 events, the authors could not actually determine whether participants experienced traumatic events, those events meeting both criteria. Thus, not assessing for the presence of criterion A2 may have resulted in the contradictory findings of these studies. Participants who choose criterion A1 events as their worst or most traumatic event may not have experienced that event with a strong emotional response, which would disqualify that event from being considered traumatic according to the DSM-IV-TR.

Boals and Schuettler (2009) designed a study to determine whether the differences found in previous research would remain if both the presence of criterion A1 and the presence of A2 were used to qualify an event as traumatic. Additionally, the authors allowed participants to determine themselves whether their event and experience met criteria A1 and A2. This

methodological addition removed the subjective process of raters' coding the participants' events as traumatic, which has been shown to affect the prevalence rates of criterion A1 events strongly (Van Hooff et al., 2009). After participants selected their worst event from a list of potentially traumatic events, they were asked, based on the specific DSM language, whether the event met criterion A1 and A2. The authors found that including criterion A2, when differentiating between a traumatic and non-traumatic event led to a finding of a greater amount of PTSD symptoms for trauma groups (A1 +A2) compared to non-trauma groups (no A1 and no A2). However, while there was a main effect on symptom levels for response type (presence/absence of criterion A2), there was neither a main effect for event type nor an interaction effect for event type and response type. The authors suggest that their findings implicate the critical and more prominent role of criterion A2 as an etiological factor in the development of PTSD. They conclude by stating,

> "A variety of events, not only those that currently meet A1 criterion, can result in significant levels of PTSD. Indeed, 12.8% of events coded as non-traumatic were associated with PTSD levels indicative of probable PTSD. This finding is important because it suggests that studies examining PTSD need not limit themselves to DSM-defined trauma events (Boals & Schuettler, 2009)."

Because of the narrow and exclusionary nature of criterion A1, many events that have been shown to lead to or be associated with the development of PTSD-like symptom presentations are not considered in the DSM category. Based on the cited studies the question remains whether the subjective experience of an event plays a larger role in determining PTSD than the objective type of event. Perhaps, rather than excluding events based on their category, it might be more useful to determine what constitutes a traumatic event based on the magnitude of

the event (Weathers & Keane, 2007); although the magnitude of event could be assessed by classifying or scaling event types, it also appears that the magnitude is best indicated by the intensity of an individual's subjective response. For example, the DSM-IV-TR (APA, 2000) includes the category of "serious accidents" in the criteria for a traumatic event. The fact that even a serious accident can vary from a "fender bender" to a fatal crash indicates that the magnitude of the event, as assessed by an individual's subjective experience, should play a more prominent role than the category itself (Boals & Schuettler, 2009).

The Importance of Criterion A2

While criterion A1 represents a supposedly objective approach to trauma (although there are reliability problems in classifying an event as A1), criterion A2 refers to the subjective experience of the individual while experiencing a traumatic event. According to DSM-IV-TR, both criteria must be met in order for a diagnosis of PTSD, which demonstrates the importance of an individual's response while undergoing a traumatic event. As previously stated, some authors believe that an individual's subjective response may play a more prominent role in the etiology of PTSD (Boals & Schuettler, 2009), and a meta-analytic review of the literature has demonstrated that subjective processes, like peritraumatic emotional responding and dissociation that occur during a traumatic event are highly predictive of the subsequent development of the disorder (Ozer, Lipsey Best, & Weiss, 2003). Therefore, the expansion of criterion A1to include more events could not be considered problematic if we also assess the magnitude of the subjective response of the individual during and after the traumatic event (Weathers & Keane, 2007). Thus, it is important to consider the literature discussing criterion A2 as a significant predictor of PTSD, as well as theories that support the importance of an individual's subjective response in the development of the disorder.

Research indicates that criterion A2 responses by themselves are strong predictors of PTSD symptoms or diagnoses. Epidemiological studies demonstrate that criterion A2 is present in about 75% of individuals who experience a criterion A1 event (Breslau & Kessler, 2001; Creamer, McFarlane, & Burgess, 2005). However, Breslau and Kessler (2001) found that those who met criterion A1 without criterion A2 were less likely to develop PTSD symptoms than individuals who met both criterion A1 and criterion A2. Creamer, McFarlane and Burgess (2005) demonstrated that intense emotional responding at the time of a traumatic event was associated with elevated rates of both PTSD and other psychiatric conditions, such as major depressive disorder and substance use disorders. Furthermore, in a longitudinal study examining the development of PTSD in crime victims Brewin, Andrews and Rose (2000) found that criterion A2 subjective responses predicted the development of PTSD as assessed by self-report at a 6 month follow-up. This study provides evidence for a causal relationship between subjective responses and subsequent PTSD diagnoses.

Theories Regarding the Etiology of PTSD

Theories that address the etiology of PTSD rarely place objective limitations on to what types of events can lead to PTSD. Rather, theorists discuss the cognitive, behavioral and/or biological processes that lead to commonly observed symptoms in PTSD presentations, and many of the processes described by theorists are highly subjective. For example, a cognitive model of PTSD presented by Ehlers and Clark (2000) emphasizes the role of current, perceived threat in the maintenance of the disorder. The authors attribute the primary sources of perceived, current threat to disorganized memory processes and ongoing, problematic appraisals related to the event and its aftermath. It is the opinion of this paper that both emotional processes that lead

to disorganized memory and cognitive appraisals that maintain symptoms could be better determined by assessing an individual's subjective experience of an event.

Regardless of which event types should be included under Ehlers and Clark's model, research indicates that the model has clinical utility related to predicting PTSD in survivors of motor vehicle accidents (MVA). A recent prospective study examined the predictive power of cognitive models related to the development of PTSD, depression and travel phobia following MVAs (Ehring, Ehlers, & Glucksman, 2008). The authors found that cognitive variables, derived from Elhers and Clark's model, significantly predicted PTSD symptom severity at 6 months, after statistically controlling for initial symptom severity. Results of the study also indicated that the cognitive model provided a better fit than a model composed of significant risk factors deduced from a previously conducted meta-analysis (Ozer, Best, Lipsey, & Weiss, 2003). This study also suggests a causal role for cognitive variables.

Mineka and Zinbarg (2006) proposed a contemporary learning model of PTSD that emphasizes the role of perceived predictability and controllability during the experience of a traumatic event. The authors reviewed the literature regarding non-human reactions to uncontrollable and unpredictable stress and determined that the reactions observed in animal models were similar to symptoms of PTSD in humans. Furthermore, Mineka and Zinbarg elaborate how it may not be the objective intensity of a traumatic event that elicits a PTSD response, but rather coping strategies (i.e. mental defeat) that are associated with determining that an event is out of one's control.

Biological models of PTSD suggest that traumatic stress can lead to chronic physiological disturbances that are associated with the development of the disorder. More specifically, researchers postulate that traumatic stress can lead to the dysregulation of the

sympathetic-adrenal-medullary system (SAMS) and the hypothalamic-pituitary-adrenal (HPA) axis (Olff, Langeland, Darijer, & Gersons, 2007). It is proposed that cognitive processes that occur during and after a traumatic event may play a role in this dysregulation of the HPA-axis and SAM systems (Olff, Langeland, & Gersons, 2005).

A model of stress and coping that appears to tie some of the aspects of cognitive, learning and biological theories of PTSD together has been proposed by Lazarus and colleagues (Folkman, 1984; Folkman & Lazarus, 1985; Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986). Rather than viewing stress as a stimulus or response, Lazarus and colleagues view stress "as a relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her coping resources and endangering his or her well-being" (Folkman, 1984, p. 840). This "transactional" model of stress and coping highlights the importance of understanding stress as a process, instead of as a static, objective entity (Folkman & Lazarus, 1985). Both cognitive appraisals and coping strategies play an essential role during the process of experiencing stress.

Folkman (1984) differentiates between primary appraisals of personal relevance and stressful nature of the event (harm/loss, threat, or challenge), and secondary appraisals, evaluating coping resources and options. A combination of the stressful appraisals made and the effectiveness of the coping strategies utilized will likely determine the amount of stress felt by an individual. Although this model has rarely been applied to traumatic stress, it does demonstrate that the experience of stress is a highly subjective process, and it may provide a potential explanation for the development of PTSD after experiencing stressful life events (Olff, Langeland, & Gersons, 2005).

Expanding the Subjective Responses Included in Criterion A2

Research indicates that other emotions present at the time of a traumatic event can serve as significant predictors of PTSD. For example, Street and Arias (2002) found that intense feelings of shame and guilt were predictors of PTSD in women who had experienced domestic abuse. Furthermore, Ehlers, Mayou and Bryant (1998) examined the development of PTSD in victims of MVAs and found that anger with others at the time of the traumatic event was a significant predictor of PTSD. While investigating the longitudinal experiences of crime victims, Andrew, Brewin, Rose and Kirk (2000) found that both anger and shame were significant predictors of the later development of PTSD. Interestingly, there were three participants in this study who met criteria for a PTSD who did not report experiencing an A2 emotion. Each of these participants did report experiencing either intense anger or shame, which suggests that shame and anger, which are not included as criterion A2 emotions, can potentially lead to the development of PTSD. Orth and Maercker (2009) found that anger at self or perpetrator was significantly associated with PTSD symptoms.

Hypotheses

The current study attempts to evaluate the importance of criterion A2 in the expression of PTSD. Criterion A1, the objective criterion, restricts the type of events that can be taken to precipitate PTSD and that can allow a diagnosis. Recent research questions whether this restriction is warranted. Despite the close relationship between experiencing a criterion A1 event and criterion A2 response, A2 responses serve as better predictors of the presence of PTSD symptoms (Breslau & Kessler, 2001). Recent research also demonstrates that strong emotional reactions during the event, including emotional responses not included in criterion A2, serve as significant predictors of PTSD symptoms. Therefore, it appears that the emotional response of an

individual makes an event traumatic, rather than the type of event that the individual experiences. This leads to the following hypotheses:

Hypothesis 1

In the current study, it was predicted that criterion A1 events would be associated with higher rates of criterion A2 responses. This prediction was made because epidemiological studies, as well as our everyday understanding of stress responses, indicate that there is a close association between criterion A1 events and criterion A2 emotional responses (Breslau & Kessler, 2001; Creamer et al., 2005).

Hypothesis 2

Furthermore, it was hypothesized that Criterion A2 responses would be associated with higher rates of PTSD symptoms regardless of event type (A1 or non-A1). Despite the close relationship between A1 events and A2 responses, individuals who experience an A1 event without an A2 response are less likely to develop PTSD (Breslau and Kessler, 2001), and findings of several studies demonstrate that A2 responses may play a more prominent role in the expression of the disorder (Boals & Schuttler, 2009; Frazier et al., 2009).

Hypothesis 3

Finally, it was predicted that emotions not included in the language of criterion A2 (*e.g.* guilt, shame and anger) would also be significant predictors of PTSD symptoms in college students after statistically controlling for gender, time since trauma and current affect at the time of the study. While the current language of criterion A2 limits the type of emotional reactions that may lead to PTSD to intense feelings of fear, the literature has demonstrated that strong emotional reactions of shame, guilt and anger may also play a role in the development of PTSD (Andrew, Brewin, Rose & Kirk, 2000; Ehlers, Mayou & Bryant, 1998).

Application to Causal Models of PTSD

Although the proposed study utilizes a correlational design, it does have implications for causal models that explain the etiology of PTSD. Olff, Langeland, Darijer, and Gersons (2007) provided causal model that explains how PTSD and other psychiatric conditions may develop after experiencing a traumatic event (see Figure 1). This study provides data about the relationship between emotional responding and PTSD symptoms. (Emotional responding and PTSD symptoms are highlighted in the model in Figure 1.)

Method

Participants

Participants consisted of 152 volunteers from an introduction to psychology participant pool at The University of Montana - Missoula. Of the 152 participants, 75 were female (49.3%) and 77 were male (50.7%). The mean age was *m* = 21.5 (S.D. = 4.9), and 87% of the sample was Caucasian. Other demographic variable are included in Table 1. Participants received course credit for their involvement in the study. All participants indicated either a criterion A1 or non-A1 event. Twelve participants were excluded from data analysis for either not fully completing the questionnaire packet or specifying a worst event that was not on either the *SLESQ* or *LES*.

Measures

Demographic Survey Form

A demographic form was included to collect any relevant demographic information. Demographic information in the form included age, gender, education year, ethnicity and marital/partner status. Participants could only indentify with one ethnicity. Gender was coded as zero for females and one for males.

Stressful Life Events Screening Questionnaire (*SLESQ*; Goodman, Corcoran, Turner, Yuan & Green, 1998)

The *SLESQ* is a self-report measure that screens for a history of criterion A1 traumatic events in college populations. The questionnaire contains 13 items and asks behaviorally specific questions regarding those events. The pilot study assessing the initial psychometric properties of the instrument demonstrated adequate reliability and validity in a college population (Goodman et al., 1998). Test-retest reliability for a 2 week interval was good (*kappa* = .89), and convergent validity adequate, with a median *kappa* of .73. The *SLESQ* also provided good discrimination between criterion A1 and non-criterion A1 events.

Life Experiences Survey (*LES*; Sarason, Johnson & Siegal, 1978)

The *LES* is a self-report measure of an individual's history of stressful life events. It was used here to assess non-A1 events. The measure contains 57 items and is divided into 2 sections: Forty-seven questions refer to stressful changes that can occur throughout a variety of life experiences, and 10 questions specifically refer to stressful life events that occur during college. Long et al. (2008) used the *LES* to determine participants' worst stressful life event, but, because the *LES* contains some items that may be considered criterion A1 events, the authors made revisions to exclude those items. The same alterations were used for this study (see, Long et al., 2008, for further details).

In the present study, participants were asked to complete the *SLESQ* and the revised *LES*, and specify their "worst" event from either questionnaire. Participants who chose events from the *LES* were included in the non-criterion A1 group. Participants who selected an event from the *SLESQ* were included in the criterion A1 group.

PTSD Checklist - Specific (*PCL-S*; Blanchard, Jones-Alexander, Buckley & Forneris, 1996)

The *PCL-S* is a self-report inventory of PTSD symptoms related to a specific event. The questionnaire contains 17 items assessing PTSD symptoms from the DSM-IV-TR. Each symptom is rated on a Likert scale from 1, "not at all" to 5, "extremely." People with scores of 44 or higher may be considered "probable" cases of PTSD. Recently, Adkins, Weathers, Murphy and Daniels (2008) assessed the psychometric properties of various self-report measures of PTSD in a college sample and they recommended the use of the *PCL-S*. Participant's scores on the *PCL-S* demonstrated adequate test-retest reliability (r = .87) and internal consistency (Cronbach's *alpha* = .91). The *PCL-S* was used to determine the current PTSD symptom intensity related to each participant's worst event.

The Trauma Emotion Questionnaire (*TEQ*: Vernon, 2009)

The *TEQ* was originally developed by Vernon (2000) to assess emotional reactions in individuals who had experienced traumatic events. The questionnaire is composed of 24 items, 20 of which load onto 7 different scales: anger, fear, sadness, guilt, shame, surprise and disgust. Each item requires a response on a 5 point Likert type scale from 1, "not at all," to 5, "extremely." In the instructions for this measure, participants were asked to "indicate to what extent [they] felt this way during [their] worst event." Participants were then asked to specify their "worst event" on the document. In a recent study evaluating emotional reactions to traumatic events in college students, scores on the *TEQ* demonstrated good internal consistency within the scales (α = .81-.93: Amstadter & Vernon, 2008). In the present study the 4 subscales on the *TEQ* (fear, anger, guilt and shame) were used to assess emotional reactions at the time of the traumatic event. Subscales were scored using a formula in Microsoft Excel that added up

individual item scores for each subscale and then divided that total by the number of items loading into the subscale.

Positive and Negative Affect Schedule (*PANAS;* Watson, Clark, & Tellegen, 1988)

The PANAS is a self-report measure comprised of two, 10 item scales that measure positive affect (PA) and negative affect (NA). Individuals are asked to indicate the extent to which they feel an emotion in the present moment from 1 ("slightly or not at all") to 5 ("extremely"). Scores on the *PANAS* were calculated using a formula in Microsoft Excel that added up a total score for each subscale and then divided each total subscale score by 10 (the number of items in each subscale). A prior study demonstrated good internal consistency for both the PA scale (*alpha* = .89) and NA scale (*alpha* = .89) in a representative college sample (Watson, Clark, & Tellegen, 1988).

Bodkin, Pope, Detke and Hudson (2007) examined participants who were part of a randomized controlled trial of depression treatment to determine whether those diagnosed with depression could also meet criteria for PTSD if presence of a traumatic event were established. Structured diagnostic interviews were given to the participants to assess for trauma history, but of more importance here, PTSD symptoms as well. The authors found that a majority of these depressed participants met the full symptom presentation of PTSD despite the absence of a prior PTSD diagnosis and absence of a criterion A1 stressor. Thus, the *PANAS* was used to statistically control for current levels of negative and positive affect in the present study. These are used as proxy measures of depression and anhedonia.

Procedure

Participants completed a packet of self-report measures in groups determined by sign-up sheets. Each participant completed the questionnaire packet in a private room after receiving

instructions on how to complete the packet. The *PANAS* was completed first to measure baseline levels of positive and negative affect. As noted, scores on the *PANAS* were used as covariates to statistically control for current emotionality. The *SLESQ* and *LES* were then completed in that order to determine a history of both criterion A1 events and non-A1 events. Because the *LES* contains some items that are very common in a college student population, it was assumed that all participants would endorse at least one event and be able to complete the study; this was indeed the case. Participants were asked to select one event from either list that they consider their "worst" event. The event selected was used as basis on which most of the other measures were completed. After determining their "worst" event, participants were asked when the event occurred, in order to assess for the amount of time that had passed since their chosen event. The number of months since the event occurred was used as a statistical control. Additionally, participants were asked if their "worst" event was experienced with "intense fear, horror or helplessness" to determine the presence or absence of criterion A2, as it is described in the DSM-IV-TR. A similar procedure was utilized by Boals and Schuettler (2009).

Next, the *TEQ* was used to determine the intensity of different peritraumatic emotions. As noted, the instructions specify for the participants to indicate how they felt during their "worst event." Then, the *PCL-S* was completed to determine current PTSD symptoms related to the event that was chosen. After completion of the questionnaires, participants were debriefed and given resources for coping with any distress resulting from the study as well as referrals to the University's counseling clinic.

Results

The mean *PCL-S* score for men was m = 34.03 (SD = 14.3), and for women, m = 35.9 (SD =13.64). An independent-samples *t* test indicated that the difference in *PCL-S* scores was not statistically significant [t (1, 141) = .795, p = .428].

Hypothesis 1

It was hypothesized that there would be an association between Criterion A1 and A2 of PTSD. The presence or absence of Criterion A1 was determined on the basis of the questionnaire from which each individual chose the worst event. Events chosen from the *SLESQ* indicated the presence of A1, while events selected from the *LES* indicated the absence of A1. The presence or absence of A2 was assessed by participants responding to either "yes" or "no" to a question asking whether the event "was experienced with fear, horror, and/or helplessness", the specific language of A2. Four participants were excluded from this data analysis due to missing data. A contingency table was constructed to determine the frequencies of these events (see Table 2). A Pearson *Chi Square* Test of Independence was conducted to determine whether there was an association between those criteria. As hypothesized, those variables were not independent of one another, X^2 (1, N = 148) = 4.60, p = .032. Seventy-six percent of participants who experienced a criterion A1 event also indicated a criterion A2 response, which is comparable to prior research findings (Breslau & Kessler, 2001; Creamer, McFarlane & Burgess, 2005)

Hypothesis 2

It was hypothesized that Criterion A2 responses would be associated with higher PTSD symptom scores regardless of whether the event chosen met Criterion A1. A two-way ANOVA was conducted with the independent variables being Criterion A2 (presence, absence) and Criterion A1 (presence, absence). PTSD symptoms scores from the *PCL-S* were used as the

dependent variable. Means and standard deviations for each cell are listed in Table 3. The main effect of presence of Criterion A2 was significant, yielding an *F* ratio (1, 138) = 7.46, p = .00; these results indicate that regardless of event chosen, individuals who report experiencing criterion A2 obtain higher scores on the *PCL-S* than individuals who did not indicate experiencing Criterion A2. Additionally, the main effect of Criterion A1 was also significant [*F* (1, 138) = 5.76, p = .018]. Surprisingly, individuals who experienced non-traumatic events reported higher PTSD symptom scores than individuals who experienced traumatic events. The interaction was non-significant, [*F* (1, 138) = .01, p > .05]. There was a "small to u4medium effect" (Kirk, 1996, p. 751) for the main effect of criterion A1 and criterion A2 (partial *eta squared* values are listed in Table 4).

Hypothesis 3

Four subscales scales on the *TEQ* (i.e. fear, guilt, anger and shame) were used as predictor variables in this analysis, while statistically controlling for gender, time since trauma and current affect. Peritraumatic sadness was removed from the model for this analysis because there was not prior research or theory to support its inclusion. Fourteen participants were excluded from the analysis for either not completing the questionnaire packet or for filling out the *TEQ* or *PANAS* incorrectly. *PCL-S* scores were used as the criterion or dependent variable. Means and standard deviations were calculated for all relevant variables and a correlation matrix was computed (see Table 5**)**. Muilticollinearity was not determined to be problematic because the variable inflation factor did not exceed 5 for any predictor variable.

A block entry, multiple regression analysis was used to test the third hypothesis that emotions other than those included within the language of Criterion A2 would be significant predictors of PTSD symptom scores. Gender, time since trauma and current positive and

negative affect were entered in the first block as statistical controls, and subscales from the *TEQ*, including anger, fear, guilt, and shame, were entered as the second block to examine the amount of variance explained by different peritraumatic emotional responses. The first block in the model explained 8% of the total variance in the criterion variable (adjusted *R square* = .08), which was statistically significant [F (4, 133) = 3.96, p = .005]. Of the four predictor variables included in the first block, only current negative affect explained a significant portion of the variance in PTSD symptom scores [t (133) = 3.31, p = .001]. Current negative affect also uniquely explained 7.3% of the variance in the criterion variable (squared semi-partial correlation r = .073).

The second block, including the *TEQ* subscales of fear, shame, guilt and anger, uniquely added 13.8% of explained variance over and above that of the former block, bringing the adjusted *R* squared to .218. That change of variance explained was statistically significant [F (5, 128) = 5.57, p < 0001]. Within the second model peritraumatic fear and guilt significantly predicted PTSD symptom scores. Peritraumatic fear explained 4.8% (squared semi-partial correlation r = .048) of the total variance of PTSD symptoms scores, while peritraumatic guilt explained 2.7% (squared semi-partial correlation = .027). Peritraumatic anger did not contribute significantly to predicting the criterion variable [t (128) = 1.90, p = .071)], although it did uniquely explain 1.8% of variance within the model (squared semi-partial correlation = .018). Peritraumatic shame also did not contribute significantly to predicting the criterion variable [t (128) = -.804]. Information on other predictor variables can be found on Table 6.

Discussion

The current study evaluated the potential importance of an individual's subjective response in the development of PTSD symptoms. Several findings within this study indicate that

an individual's subjective experience of an event is associated with the presence of PTSD symptoms. First, the findings of this study suggest that there is an association between experiencing a criterion A1 traumatic event and having a criterion A2 response in an undergraduate college sample. This finding is consistent with previous literature that indicates that there is a relationship between those two variables (Breslau & Kessler, 2001; Creamer et al., 2005). Specifically, individuals who experience a criterion A1 traumatic event are very likely to respond in a manner consistent with the language of criterion A2.

Secondly, the findings of this study demonstrate the importance of criterion A2 in relation to the PTSD symptoms. In support of the results of Boals and Schuettler (2009) a significant main effect was found for criterion A2 in predicting PTSD symptoms. This main effect indicates that individuals who experience fear, horror and helplessness during an event, regardless of whether that event qualifies as a criterion A1traumatic event, are more likely to report PTSD symptoms than individuals who do not. This indicates that the subjective response of an individual at the time of an event provides some utility in determining whether an individual will develop PTSD.

Although no predictions were made about the main effect for criterion A1, it was also statistically significant. That main effect indicates that non-criterion A1 stressful life events are associated with higher PTSD symptom scores than criterion A1 traumatic events. Although this finding is somewhat surprising, it is consistent with prior literature that has compared the correlates of stressful life events and traumatic events on PTSD symptoms in research participants (Gold et al., 2005; Long, et al., 2008; Mol et al., 2005; Van Hooff et al., 2009). It is unclear why this difference exists, but a potential explanation is that non-criterion A1 events may have occurred more recently than criterion A1 events. An Analysis of Covariance was conducted

to examine whether the main effect observed for both event type (criterion A1) and response type (criterion A2) would remain significant while statistically controlling for time since the event. When time since the event was included as a covariate, the main effect for event type was no longer significant, which indicates that the difference observed between criterion A1 and non-A1 events may be better explained by the amount of time elapsed since those events occurred.

Finally, this study demonstrates that peritraumatic emotions not included in Criterion A2 can significantly predict PTSD symptoms in college students, after statistically controlling for gender, time since trauma and current affect. This finding is consistent with some prior literature that has indicated that intense guilt at the time of a traumatic event can serve as a predictor of PTSD symptoms (Andrew et al., 2000; Ehlers et al., 1998; Street et al., 2002). Although peritraumatic anger was not a statistically significant predictor of PTSD symptoms in this study it may have become statistically significant if sample size was increased.

Limitations

Participants from psychology 100 courses were self-selected into this study. The lack of random sampling also impacts the generalizability of this study. However, given that previous literature has indicated that the college students may be a high risk population (Bernat, Ronfeldt, Calhoun & Arias, 1998), this study provides relevant information regarding this population and PTSD.

Limitations of this study also include the use of retrospective, self-report measures to assess participant's history of trauma, PTSD symptoms and previous emotional responses Research has consistently indicated that retrospective accounts of traumatic events may not be accurate, and subjective interpretations may not remain stable across time (Rosen, 2004-2005). Therefore, using this type of information to draw conclusions about PTSD remains confounded

by these inherent problems. Self-report measures of PTSD symptoms also lack specificity and may be influenced by a variety of factors besides an individual's traumatic experience (Engelhard, Arntz, & van den Hout, 2007), particularly if much time has elapsed since the original event. For example, Engelhard and colleagues (2007) found that individuals diagnosed with anxiety disorders other than PTSD were likely to screen positive for PTSD on the *Posttraumatic Symptom Scale* (*PSL*; Foa, Riggs, Dancu, & Rothbaum, 1993), a widely used self-report measure of PTSD symptoms. While the *PSS* was not used in this study, it can be anticipated that other self-report measures of PTSD, including the *PCL-S*, share similar problems

Future research would do well to examine the role of criterion A2 in clinical populations. Although this study provides support for the role of criterion A2 in a relatively healthy college sample, it tells clinicians very little about the role of criterion A2 in those diagnosed with full-criterion PTSD. In order to determine the clinical relevance of this research, it would be imperative for researchers to research the role of criterion A2 in participants who have been diagnosed with PTSD. Furthermore, using diagnostic interviews to determine past and present diagnoses of PTSD would ameliorate many of the problems associated with using self-report measures. The *PCL-S* and other self-report measures of PTSD only assess current PTSD symptoms related to a traumatic event. Diagnostic interviews would enable researchers to gather information regarding current and past PTSD diagnoses.

Conclusion

With a revision of the DSM imminent changes are being considered with regard to the two parts of criterion A of PTSD. Given that criterion A2 has been demonstrated to serve as a better predictor of PTSD symptoms than criterion A1, revisions for DSM-V should reflect these findings. This could be accomplished by eliminating or broadening criterion A1 and placing a

greater emphasis on the emotional response of an individual during a stressful event, rather than focusing on a limited number of event types. Furthermore, criterion A2 should be expanded to include other negative emotions, which have served as predictors of PTSD in addition to fear, horror and helplessness. Almost two decades ago Davidson and Foa (1991) discussed the possibility of expanding criterion A to include all events if research were to demonstrate that those who experienced less severe types of stressors could indeed develop PTSD. Research has blossomed since this idea was proposed and strongly suggests that a variety of life events can precipitate the onset of PTSD if an individual responds to the event with certain intense negative emotions.

References

Adkins, J.W., Weathers, F.W., McDevitt-Murphy, M., & Daniels, J.B. (2008). Psychometric properties of seven self-report measures of posttraumatic stress disorder in college students with mixed civilian trauma exposure. *Journal of Anxiety Disorders, 22,* 1393-1402.

American Psychiatric Association: *Diagnostic and Statistical Manual of Mental Disorders,* Fourth Edition, Text Revision. Washington, DC, American Psychiatric Association, 2000.

Alden, L.E., Regambal, M.J., & Laposa, J.M. (2008). The effects of direct versus witnessed threat on emergency department healthcare workers: Implications for PTSD criterion A. *Journal of Anxiety Disorders,* 22, 1337-1346.

Amstadter, A.B., & Vernon, L.L. (2008). Emotional reactions during and after trauma: A comparison of trauma types. *Journal of Aggression, Maltreatment and Trauma,* 16, 391-408.

Andrews, B., & Brewin, C.R., & Rose, S., & Kirk, M. (2000). Predicting PTSD symptoms in victims of violent crime: The role of shame, anger and childhood abuse. *Journal of Abnormal Psychology, 1,* 69-73.

Bernat, J.A., Ronfeldt, H.M., Calhoun, K.S. & Arias, I. (1998). Prevalence of traumatic events and peritraumatic predictors of posttraumatic stress symptoms in a nonclinical sample of college students. *Journal of Traumatic Stress, 11,* 645-664.

Blanchard, E.B., Jones-Alexander, J., Buckley, T.C., & Forneris, C.A. (1996). Psychometric properties of the PTSD Checklist (PCL). *Behavior Research and Therapy, 34,* 669-673.

Boals, A., & Schuettler, D. (2009). PTSD symptoms in response to traumatic and non-traumatic events: The role of respondent perception and criterion A2. *Journal of Anxiety Disorders, 21,* 458-462.

Bodkin, J. A., Pope, H. G., Detke, M. J., & Hudson, J. I. (2007). Is PTSD caused by traumatic stress? *Journal of Anxiety Disorders, 21,* 176-182.

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

Breslau, N., & Kessler, R. (2001). The stressor criterion in DSM-IV posttraumatic stress disorder: An empirical investigation. *Biological Psychiatry, 50,* 699-704.

Brewin, C.R., Andrews, B., & Rose, S. (2000). Fear, helplessness and horror in posttraumatic stress disorder: Investigating DSM-IV criterion A2 in victims of violent crime. *Journal of Traumatic Stress, 13,* 499-509.

Brewin, C.R., Andrews, B., & Valentine, J.D. (2000) Meta-analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults. *Journal of Consulting and Clinical Psychology, 5,* 748-766.

Cameron, A., Palm, K., & Follette, V. (2010). Reaction to stressful life events: What predicts symptom severity? *Journal of Anxiety Disorders, 24,* 645-649.

Creamer, M., McFarlane, A.C., & Burgess, P. (2005). Psychopathology following trauma: The role of subjective experience. *Journal of Affective Disorders, 86,* 175-182.

Czarnocka, J., & Slade, P. (2000). Prevalence and predictors of posttraumatic stress symptoms following childbirth. *British Journal of Clinical Psychology, 39,* 35-51.

Davidson, J. R., & Foa, E. B. (1991). Diagnostic issues in posttraumatic stress disorder: Considerations for the DSM-IV. *Journal of Abnormal Psychology, 100*, 346-355.

Dremin, S. (1991). Coping with the trauma of divorce. *Journal of Traumatic Stress, 4*, 113-121.

Ehlers, A., Mayou, R.A., & Bryant, B. (1998). Psychological predictors of chronic posttraumatic stress disorder after motor vehicle accidents. *Journal of Abnormal Psychology, 107*, 508-519.

Ehlers, A., & Clark, D.M. (2000). A cognitive model of PTSD. *Behavioral Research and Therapy, 38,* 319-345.

Ehring, T., Ehlers, A., & Glucksman, E. (2008). Do cognitive models help in predicting the severity of posttraumatic stress disorder, phobia and depression after motor vehicle accidents? A prospective longitudinal study. *Journal of Consulting and Clinical Psychology, 76,* 219-230.

Engelhard, I. M., Arntz, A., & van den Hout, M.A. (2007). Low specificity of symptoms on the post-traumatic stress disorder (PTSD) symptom scale: A comparison of individuals with PTSD, individuals with other anxiety disorders and individuals without psychopathology. *British Journal of Clinical Psychology, 46,* 449-456.

Folkman, S. (1984). Personal control and stress and coping processes: A theoretical transaction. *Journal of Personality and Social Psychology, 46*, 839-852.

Folkman, S., Lazarus, R.S., Dunkel-Schetter, C., Delongis, A., & Gruen, R.J. (1986). Dynamics of a stressful encounter: Cognitive appraisal, coping and encounter outcomes. *Journal of Personality and Social Psychology, 50,* 992-1003.

Frazier, P., Anders, S., Perera, S., Tomich, P., Tennen, H., Park, C., & Tashiro, T. (2009). Traumatic events among undergraduate students: Prevalence and associated symptoms. *Journal of Counseling Psychology, 56*, 450-460.

Gold, S.D., Marx, B.P., Soler-Baillo, J.M., & Sloan, D.M. (2005). Is life stress more traumatic than traumatic stress? *Journal of Anxiety Disorders, 19,* 687-698.

Goodman, L.A., Corcoran, C., Turner, K., Yuan, N. & Green, B.L. (1998). Assessing traumatic event exposure: General issues and preliminary findings for the Stressful Life Events Questionnaire. *Journal of Traumatic Stress, 11,* 521-542.

Hathaway, L.M., Boals, A., & Banks, J.A. (2010). PTSD symptoms and dominant emotional response to a traumatic event: An examination of DSM-IV criterion A2. *Anxiety, Stress & Coping, 23*, 199-126.

Jones, E. & Wessely, S. (2007). A paradigm shift in the conceptualization of psychological trauma in the 20th century. *Journal of Anxiety Disorders, 21,* 164-175.

Karl, A., Rabe, S., Zollner, T., Maercker, A., & Stopa, L. (2009). Negative-self-appraisals in treatment seeking survivors of motor vehicle accidents. *Journal or Anxiety Disorders, 23*, 775-781.

Kessler, R.C., Berglund, P., Demler, O., Jin, R., Merikangas, K.R., & Walters E.E. (2005). Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the national comorbidity survey replication. *Archives of General Psychiatry 62,* 593-603.

Kessler, R.C., Sonnega, A., Bromet, E., Hughes, M., & Nelson C.B. (1995). Posttraumatic stress disorder in the national comorbidity survey. *Archives of General Psychiatry, 52,* 1048-1060.

Kirk, R.E. (1996). Practical significance: a concept whose time has come. *Educational and Psychological Measurement, 56,* 746-759.

Lancaster, S.L., Melka, S.E., & Rodriguez, B.F. (2009). An examination of the differential effects of the experience of DSM-IV defined traumatic events and life stressors. *Journal of Anxiety Disorders, 23,* 711-717.

Lazarus, R.S., & Folkman, S. (1985). If it changes it must be a process: Study of emotion and coping during three stages of a college examination. *Journal of Personality and Social Psychology, 48,* 150-170.

Long, M.E., Elhai, J.D., Schweinle, A., Gray, M.J., Grubach, A.L., & Frueh, B.C. (2008). Differences in posttraumatic stress dirsorder diagnostic rates and symptom severity between criterion A1 and non-criterion A1 events. *Journal of Anxiety Disorders, 22,* 1255-1263.

McNally, R.J. (2003). Progress and controversy in the study of posttraumatic stress disorder. *Annual Review of Psychology, 54,* 229-252.

Mineka, S. & Zinbarg, R. (2006). A contemporary learning theory perspective on the etiology of anxiety disorders. *American Psychologist, 61,* 10-26.

Mol, S.S., Arnzt, A., Metsemakers, J.F., Dinant, G., Vilters-Van Montfort, P.A. & Knottnerus, J.A. (2005). Symptoms of posttraumatic stress disorder after non-traumatic events. Evidence from an open population study. *British Journal of Psychiatry, 186,* 494-499.

Olff, M., & Koeter, M.W., Van Haaften, E.H., Kersten, P.H., & Gersons, B.P. (2005). Impact of a foot and mouth disease crisis on post-traumatic stress symptoms in farmers. *British Journal of Psychiatry,* 186, 165-166.

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

Olff, M., Langeland, W., & Gersons, B.P. (2005). The psychobiology of PTSD: coping with trauma. *Psychoneuroendocrinology, 30,* 974-982.

Orth, U., & Maercker, A. (2009). Posttraumatic anger in crime victims: Directed at the perpetrator or at the self. *Journal of Traumatic Stress, 22,* 158-161.

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

Radloff, L. S. (1977). The CES-D Scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement, 1,* 385–401.

Rosen, G. M. (2004-2005). Traumatic events, criterion creep, and the creation of pretraumatic stress disorder. *The Scientific Review of Mental Health Practice, 3,* 39-42.

Sarason, I.G., Johnson, J.H. & Siegal, J.M. (1978). Assessing the impact of life changes: Development of the Life Experiences Survey. *Journal of Consulting and Clinical Psychology, 46,* 932-946.

Smyth, J.M., Hockemeyer, J.R., Heron, K.E., Wonderlich, S.A., & Pennebaker, J.W. (2008). Prevalence, type, disclosure and severity of adverse events in college students. *Journal of American College Health, 57,* 69-76.

Street, A.E., & Arias, I. (2001). Psychological abuse and posttraumatic stress disorder in battered women: Examining the roles of shame and guilt. *Violence and Victims, 16,* 65-78.

Van Hooff, M., McFarlane, A.C., Baur, J., Abraham., & M., Barnes, D. J. (2009). The stressor criterion-A1 and PTSD: A matter of opinion? *Journal of Anxiety Disorders, 23,* 77-86.

Vernon, L.L. (2000). The effects of attributions and trauma characteristics on emotion. Unpublished doctoral dissertation, University of Illinois-Urbana – Champaign, Champaign, IL.

Vernon, L.L. (2009, March). The Trauma Emotion Questionnaire (TEQ): Investigating the psychometric properties of a measure of peritraumatic emotional responses. Poster presented at the annual Anxiety Disorders Association of America conference, Santa Ana Pueblo, NM.

Weathers, F.W., & Keane, T.M. (2007). The criterion a problem revisited: Controversies and challenges in defining and measuring psychological trauma. *Journal of Traumatic Stress, 20*, 107-121.

Table 1

Descriptive Statistics for Demographic Characteristics of the Participants

Variables	*N* = 152	Percentage
Gender		
Male	77	50.7
Female	75	49.3
Transgender	0	0
Ethnicity		
Caucasian	132	86.8
African American	4	2.6
Asian/Pacific Islander	4	2.6
Latino	4	2.6
Native American	8	5.3
Education Year		
Freshman	78	51.3
Sophomore	46	30.3
Junior	15	9.9
Senior	11	7.2
Post-baccalaureate	2	1.3
Relationship Status		
Single/Not dating	66	43.4
Single/Dating	74	48.7
Married	10	6.6
Separated	2	1.3

Table 2

Crosstabulation of Criterion A1 and A2 of Posttraumatic Stress Disorder

	Criterion A2				
Criterion A1	No	Yes		X^2	*p*
No	27	39	66	4.60	.035
Yes	20	62	82		
	47	101	Σ = 148		

Table 3

Means and Standard Deviations of *PCL-S* scores for the Presence and Absence of Criterion A1 and A2

	Criterion A2			
	Present		Absent	
Event Type	M	SD	M	SD
A1	34.02	15.74	27.85	11.04
	n = 62		n = 20	
Non-A1	40.36	12.79	33.36	10.27
	n = 39		n = 27	

Table 4

Two-way Analyses of Variance for Effects of the Presence and Absence of Criterion A1 and A2 on PTSD Symptom Scores

Variable and Source	*df*	MS	*F*	*p*	η^2
Criterion A1					
Between Groups	1	1052.06	5.769	.018	.041
Criterion A2					
Between Groups	1	1298.63	7.121	.009	.050
Criterion A1 x A2					
Between Groups	1	5.174	.028	.866	.000

Table 5

Correlation Matrix for Variables Included in Block Entry, Multiple Regression

Measure	1	2	3	4	5	6	7	8	9
1. PCL	--								
2. Gender	-.04	--							
3. PANAS-P	-.13	.24	--						
4. PANAS-N	.29	.15	-.02	--					
5. Time Since	-.14	.10	.12	-.15	--				
6. Anger	.28	-.03	.10	.10	-.06	--			
7. Fear	.30	-.00	-.02	.16	.25	.26	--		
8. Guilt	.29	-.14	-.11	-.03	-.11	.33	.13	--	
9. Shame	.26	-.15	-.17	.12	-.05	.32	.23	.77	--

Table 6

Block Entry, Multiple Regression Predicting PTSD Symptom Scores

Block and Predictor Variables	Adj. R^2	ΔR^2	β	*t*	*p*	$part^2$
Block 1	.080	.080				
Gender			-.047	-.552	.582	.002
Months Since			-.079	-.939	.349	.006
PANAS-P			-.103	-1.21	.227	.010
PANAS-N			.279	3.32	.001*	.073
Block 2	.218	.138				
Gender			-.011	-.140	.889	.000
Time Since Trauma			-.115	-1.40	.164	.011
PANAS-P			-.105	-1.32	.191	.010
PANAS-N			.237	2.90	.004*	.048
Fear			.241	2.90	.004*	.048
Guilt			.270	2.19	.031*	.028
Shame			-.101	-.804	.423	.004
Anger			.150	1.80	.074	.021

Figure 1

Causal Model of Posttraumatic Stress Disorder (Adapted from Olff, Langeland, Darijer & Gersons, 2007)