Sudden Unexpected Death as a Traumatic Stressor: The Impact of the DSM-5 Revision of Criterion A for Posttraumatic Stress Disorder

by

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Abstract

The definition of a traumatic event in Criterion A for posttraumatic stress disorder (PTSD) was narrowed in *DSM-5* for events involving indirect exposure to the death of a loved one. Whereas the *DSM-IV* definition encompassed the sudden, unexpected death of a loved one regardless of the circumstances, the *DSM-5* definition now requires that the death must have involved some type of violence or accident. Although there is some support in the literature for this more restrictive definition, its effects are relatively unknown. The purpose of the present study was to examine the impact of this more restrictive definition on the prevalence of Criterion A and the symptom profile of individuals meeting the *DSM-IV* versus the *DSM-5* definition. In two samples of trauma-exposed college students, ordinal logistic regression was used to compare participants with either indirect exposure to a sudden, unexpected death (SUD); indirect exposure to a violent or accidental death (VAD); or direct exposure to a severe motor vehicle accident (MVA). PTSD symptoms were assessed using *DSM-IV* criteria in Sample 1 and *DSM-5* criteria in Sample 2. Results indicated that the more restrictive *DSM-5* definition reduced the prevalence of those meeting Criterion A for events involving the death of a loved one. However, few significant differences were found between SUD and the two trauma groups meeting *DSM-5* Criterion A (i.e., VAD and MVA) when compared on individual PTSD symptoms, PTSD symptom clusters, and other measures of psychopathology. Diagnostic and research implications regarding the Criterion A change are discussed.

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Introduction

The death of a close friend or close family member is a near-universal human experience. However, there is considerable variability in the intensity, duration, and type of reactions that people experience subsequent to the loss of a loved one. The majority of people experience a typical grief response characterized by an initial period of shock and disbelief followed by emotional and physiological distress and eventual acceptance of the loss with daily functioning returning to pre-loss levels (Gray, Prigerson, & Litz, 2004). However, a significant minority develop an atypical psychological syndrome such as complicated grief (CG) or posttraumatic stress disorder (PTSD).

Individual bereavement reactions appear to be influenced in part by the manner of the loved one's death. The circumstances of a death can range from normative to non-normative to traumatic, and several factors influence where a particular death falls on the continuum. Unfortunately, a wide array of terms (e.g., expected, unexpected, sudden, violent, normative) is used in the literature to describe different types of death events, which can create confusion. To enhance clarity, the following definitions are used in the present paper: A *normative* death involves death by natural causes near the end of a generally fulfilled life (Raphael & Wooding, 2004). *Non-normative* death is any death other than normative death. This includes death by natural causes when (a) the death was unexpected, (b) it was perceived that the individual had yet to live a fulfilled life, or (c) the individual endured tremendous suffering prior to death. Non-normative death also includes death by other than natural causes. A small portion of non-normative deaths may be further classified as a *traumatic* death, which has been defined within the grief literature as a loss for which "the mode of death is sudden, violent, or unexpected" (Green, 2000).

Problematic and distressing bereavement reactions (i.e., CG or PTSD) are more likely to develop following a traumatic loss (Bonanno & Kaltman, 2001; Green, 2000; Kristensen, Weisæth, & Heir, 2012). The death of a friend or family member and other types of traumatic events are similar in that both loss and life threat may significantly disrupt individuals' lives, threaten their sense of attachment, and trigger feelings of isolation, helplessness and loss of control (Green, 2000; Lehman, Wortman, & Williams, 1987). Accordingly, a traumatic death is likely to result in a more severely negative response because the disruption that an individual experiences is compounded. It should be noted that even though CG is more likely to follow a traumatic loss, it can also result from a loss that is neither sudden nor violent (Simon, 2012). Thus, experiencing a traumatic death is predictive of, but not necessary for, subsequent development of CG. In contrast, by definition, PTSD can only follow a loss that qualifies as a traumatic event according to *Diagnostic and Statistical Manual of Mental Disorders* (*DSM*; American Psychiatric Association [APA], 1994, 2013) Criterion A, i.e., the stressor criterion.

Due to the considerable overlap in precipitating events, using features of the loss event alone (i.e., normative, non-normative, traumatic) to differentiate between CG and PTSD may prove challenging. Unfortunately, CG and PTSD are also characterized by a similar constellation of symptoms, including reexperiencing, avoidance, numbing, and hyperarousal symptoms (Gray et al., 2004). Nevertheless, these symptoms differ substantially between CG and PTSD in the way in which they relate to the traumatic loss. For example, in CG, reexperiencing symptoms involve intrusive, distressing thoughts or memories of the deceased person, whereas in PTSD the thoughts or memories involve the traumatic event which led to the loss (Gray et al., 2004). Furthermore, typical responses to intrusive symptoms differ between these disorders. Individuals with CG typically either derive comfort from memories of the deceased or feel distress because

they long to be reunited with their loved one. In contrast, individuals with PTSD are more likely to react to intrusive memories with high levels of anxiety, fear and distress because the memories are associated with danger (Gray et al., 2004).

Compared to reexperiencing, avoidance and numbing symptoms are more similar in CG and PTSD. In both CG and PTSD, individuals tend to withdraw from social activities and interpersonal relationships. In PTSD, avoidance and numbing symptoms result from an effort to distance oneself from trauma-related reminders and cues rather than efforts to avoid reminders of the deceased, which may produce profound feelings of sadness or the reality of the death as seen in CG. In addition, avoidance symptoms are not endorsed by all individuals experiencing CG, whereas avoidance is an essential feature of PTSD and is now required for a PTSD diagnosis in *DSM-5* (Gray et al., 2004).

The largest divergence between CG and PTSD is observed in hyperarousal symptoms. In particular, very few individuals with CG report increased arousal, and any "hypervigilance" involves individuals searching their environments for reminders of the deceased and seems to be associated with a desire to be reunited with their loved one (Gray et al., 2004). In contrast, individuals with PTSD often report increased arousal and scan their environments for indicators of danger for fear that their previous trauma will recur. Given the similarities in symptom presentation between CG and PTSD, careful diagnostic evaluation is essential to determine whether symptoms are related primarily to longing for the deceased (and thus indicate CG) or to fear related to the traumatic event that led to the loss of the deceased (and thus indicate PTSD).

Most theoretical models of PTSD implicate experiencing an unexpected or uncontrollable fear-evoking traumatic event as the central etiological feature; thus it follows that fear related to the trauma recurring is an important factor in differentiating CG from PTSD. Theoretical models

suggest that the more a traumatic event is uncontrollable and unpredictable the greater the likelihood of developing PTSD symptoms (Foa, Steketee, & Rothbaum, 1989; Foa, Zinbarg, & Rothbaum, 1992). This type of event leaves individuals with a constant sense of vulnerability to danger because they feel unable to predict when another traumatic event might occur. The sudden and unexpected elements of a traumatic loss directly ties to the theoretical model put forth by Foa and colleagues (1992) and offers an explanation for the development of PTSD by some individuals following the loss of close friend or family member.

However, this theoretical model is insufficient for explaining why some people will develop CG rather than PTSD following a sudden and unexpected, non-normative death. If the unpredictability and uncontrollability of the event are the key factors, then most, if not all, individuals would develop PTSD after this type of traumatic event. Indeed, empirical findings suggest the degree of violence of the death is a stronger predictor than the suddenness of the death for risk of PTSD (Currier, Holland, & Neimeyer, 2006; Kaltman & Bonanno, 2003; Kristensen et al., 2012). With respect to PTSD, sudden deaths characterized by violence confer significantly more risk for PTSD than non-violent deaths (Murphy et al., 1999; Murphy, Johnson, Wu, Fan, & Lohan, 2003; Zisook, Chentsova-Dutton, & Shuchter, 1998).

Although these findings seem to contradict somewhat the unpredictability and uncontrollability aspects of the model put forth by Foa and colleagues (1989; 1992), they do fit with that model's notion that previous learning experiences or memories may influence the cognitive and emotional processing of a traumatic event. That is, traumatic experiences that involve situations or places that previously were associated with safety tend to produce more severe reactions (Foa, et al., 1989; Foa, et al., 1992). A sudden, unexpected loss that also involves a violent mode of death would produce a higher signal of threat which, in turn, is more

likely to induce fear conditioning and disrupt an individual's schemas related to safety and danger in the world.

Although fear conditioning and the processing of threat-related stimuli are key factors in the development of PTSD, an individual's unique posttraumatic reaction is influenced by additional diverse factors (Green, Wilson, and Lindy, 1985). These include characteristics of the individual, characteristics of the traumatic event, and characteristics of the recovery environment. The manner of death as well as other factors including an individual's previous life experiences impact how the traumatic event is processed and ultimately produce different outcomes from the same or similar events (Green, Wilson, and Lindy, 1985). Thus, determining which elements of traumatic loss are most predictive of PTSD outcomes is crucial.

Given that traumatic event exposure is required for individuals to meet diagnostic criteria for PTSD, considerable attention has been directed at determining which specific types of events qualify as part of the stressor criterion. As the PTSD diagnosis has changed and progressed since its introduction in *DSM-III* (APA, 1980), there has been ongoing debate surrounding Criterion A, i.e., the stressor criterion. Criterion A designates which types of events qualify as traumatic and thus must have been experienced by an individual to qualify for a diagnosis of PTSD. Unfortunately, generating a universally accepted definition of trauma that also can serve as a necessary criterion for the PTSD diagnosis is exceedingly difficult. This definition not only has to incorporate the numerous ways in which traumatic stressors vary, but also must define the currently unclear line of demarcation between "traumatic" and "non-traumatic" events (Weathers & Keane, 2007).

In a review of the Criterion A problem, Weathers and Keane (2007) chronicle the evolution of the stressor criterion and argue that the possibility of conceptualizing the criterion

either narrowly or broadly has existed since the inception of PTSD in *DSM-III*. In *DSM-III*, the precipitating traumatic event was defined in Criterion A as "a recognizable stressor that would evoke significant symptoms of distress in almost everyone" and "generally outside the range of usual human experience" (APA, 1980). This definition was the target of considerable criticism, because some critics believed that the definition implied that traumatic events are statistically rare, which has been contradicted by epidemiological studies indicating that potentially traumatic events are very common (Weathers & Keane, 2007). Some interpreted the definition as referring to the magnitude rather than the frequency of the precipitating event, but criticized the lack of guidelines or normative data that clinicians could use to help identify traumatic events.

The stressor criterion was slightly modified for *DSM-III-R* (APA, 1987), such that the phrases "outside the range of usual human experience" and "markedly distressing to almost anyone" were still present. However, a list of traumatic events was added to provide examples and demonstrate some of the elements that make events traumatic which somewhat addressed the critique that specific guidance for clinicians was not given (Weathers & Keane, 2007). The accompanying text in *DSM-III-R* also offered more precise descriptions of the distress induced by trauma and asserted that the event "is usually experienced with intense fear, terror, and helplessness." Notably, the *DSM-III-R* Criterion A text added a new type of qualifying event that did not require direct exposure. In particular, a trauma could involve "learning about a serious threat or harm to a close friend or relative."

Revisions made to Criterion A for *DSM-IV* signified a marked departure from the previous editions of Criterion A. The most noticeable difference was that traumatic events were defined by two essential requirements (Weathers & Keane, 2007). Criterion A1 indicates the form of exposure ("experienced, witnessed, or was confronted with") and the type of event

("actual or threatened death or serious injury, or a threat to the physical integrity of self or others." Criterion A2 focuses on an individual's subjective response to the event and requires a reaction involving "intense fear, helplessness, or horror." All of the features of this two–part criterion appeared in the accompanying text for the *DSM-III-R* Criterion A. However, *DSM-IV* specifically required in the diagnostic criteria that an individual have a particular subjective response to an event for it to qualify as traumatic rather than assuming this type of reaction is normative for all traumatic events.

Another significant change in *DSM-IV* was the inclusion of a longer list of examples of potentially traumatic events. This addition was especially concerning to some in the field, because they saw it as significantly broadening the definition of trauma (Weathers and Keane, 2007). McNally (2004) expressed concern that the changes to Criterion A for *DSM-IV* hastened "a conceptual bracket creep for the definition of trauma." In particular, the inclusion of "learning about" a traumatic event that happened to someone else in *DSM-IV* Criterion A no longer required that individuals be directly exposed to life threat. It seemed to some critics that these alterations to Criterion A broadened the definition of a traumatic event to the point where it could be inappropriately applied in both research and forensic settings (McNally, 2004; Weathers & Keane, 2007). Indeed, changes that fell within Criterion A1 may have broadened the types of events considered to be traumatic, although this was offset somewhat by the inclusion of Criterion A2, which acted as a restricting factor for identifying potentially traumatic events.

Following the revision of Criterion A in *DSM-IV*, Breslau et al. (1998) utilized a novel methodology to examine the conditional probability of developing PTSD subsequent to specific types of trauma. Previous studies assessed PTSD risk following "worst events" identified by the participants. To eliminate the likely biased identification by participants of worst events as those

that resulted in increased psychological distress, Breslau and colleagues (1998) randomly selected a traumatic event from participants' lists of lifetime traumatic events. Through this methodology, learning about the sudden, unexpected death (SUD) of a close relative or friend had an overall prevalence of 60%, which was one of the highest within their sample. Furthermore, this type of traumatic event was associated with a moderate conditional probability of PTSD (14.3%). Given both the high prevalence rate and moderate conditional risk, SUD was identified as "the single most important trauma as cause of PTSD." In fact, 31.1% of all PTSD cases in this sample could be attributed to this type of event (Breslau & Kessler, 1998). These findings offer some support for the concerns of McNally (2004) and others that the definition of trauma had been broadened in a way that allowed more individuals to qualify for a PTSD diagnosis.

The debate over Criterion A influenced the most recent version of the PTSD criteria in *DSM-5* (APA, 2013) such that efforts were made to address concerns related to conceptual bracket creep and ambiguity in definitions. As a result, the language defining a potentially traumatic event in *DSM-5* is more precise and narrower in scope (Friedman, Resick, Bryant, & Brewin, 2011). For example, the vague phrase "threat to physical integrity" in *DSM-IV* (APA, 1994) was replaced in the *DSM-5* (APA, 2013) Criterion A with "threat of sexual violence." This revision allows less room for judgment and should increase the likelihood that only those events that cross the threshold separating "very stressful" and "traumatic" are included. Notably, Criterion A2 was removed in *DSM-5*, which may have again broadened the number of events that qualify as potentially traumatic because they are no longer constrained by the type of reaction evoked in the individual as they were in *DSM-IV*. However, it is clear through the strict

language used in Criterion A in *DSM-5* that the overall intention was to narrow the definition of trauma.

One of the most explicit examples of narrowing is the change made to SUD. Given the Breslau and Kessler (1998) findings implicating SUD as the greatest contributor to PTSD diagnoses, it is not surprising that SUD was a target for change. In particular, the types of deaths considered to be traumatic are more tightly defined. Indeed, learning about the sudden and unexpected death of a loved one is no longer considered to be sufficiently traumatic. The *DSM-5* (APA, 2013) stressor criterion now specifies that an individual must not only learn about the sudden and unexpected death of a close friend or family member, but that the death must also have been violent or accidental. This change thereby excludes non-normative deaths that, although sudden and unexpected, were the result of natural causes (e.g., heart attack, meningitis). Thus, it seems that the increased likelihood of PTSD following a violent traumatic death rather than non-violent death was used at least partial justification for the revision by the *DSM-5* Trauma/Stress-Related and Dissociative Disorders workgroup (Friedman, Resick, Bryant, & Brewin, 2011; Kaltman & Bonanno, 2003; Murphy, et al., 1999; Murphy, et al., 2003; Zisook, et al., 1998). Greater empirical evidence supporting this change seems warranted because a specific set of death events (i.e., SUD), shown to be strongly related to PTSD outcomes (Breslau & Kessler, 1998), is now excluded in *DSM-5* Criterion A.

The purpose of the present study was to examine the effect of *DSM-5*'s more restrictive definition of Criterion A for events involving indirect exposure to death of a loved one, i.e., the effect of moving from SUD to VAD (for the rest of the paper, unless otherwise noted, SUD and VAD will be used to refer to indirect exposure, i.e., learning about as opposed to witnessing the death of a loved one; witnessing SUD would meet Criterion A in both *DSM-IV* and *DSM-5*). The

first aim was to determine whether moving from SUD to VAD had the intended effect of reducing prevalence of PTSD diagnoses -- specifically by reducing the number of individuals with indirect exposure to death of a loved one who meet Criterion A -- and thereby reducing the number of individuals eligible for a PTSD diagnosis. The second aim was to examine the validity of *DSM-5*'s more restrictive definition by comparing the symptom picture in individuals meeting only *DSM-IV* Criterion A for SUD to two other groups: (a) those meeting both *DSM-IV* and *DSM-5* Criterion A for VAD, and (b) those meeting *DSM-IV* and *DSM-5* Criterion A for directly experiencing a severe motor vehicle accident (MVA). In two separate samples of trauma-exposed undergraduates, these three groups (SUD, VAD, and MVA) were compared on self-reported PTSD symptoms (*DSM-IV* symptoms using the PCL for Sample 1 and *DSM-5* symptoms using the PCL-5 for Sample 2) as well as measures of other types of psychopathology related to trauma and PTSD.

The comparison between SUD and VAD was the primary focus. If the SUD group demonstrated an equivalent or more severe symptom picture than did the VAD group, this would call into question the appropriateness of excluding SUD in DSM-5 Criterion A. However, because SUD and VAD involved indirect exposure, and given that some critics of PTSD have called for excluding all forms of indirect exposure from the definition of Criterion A (Weathers, Marx, Friedman, & Schnurr, 2014), it was important to compare SUD and VAD to a group with unequivocal Criterion A exposure, i.e., those with direct personal experience of a life-threatening event. For this study, MVA was chosen because it is a well-studied traumatic stressor (Beck & Coffey, 2007; Blanchard, Hickling, Taylor, & Loos, 1995; Norris, 1992), it is one of the more commonly reported traumatic events among undergraduates (Mulye et al., 2009) and occurs in

both women and men, and it is relatively straightforward to determine whether reported MVAs involved direct exposure and life threat and thus satisfy Criterion A.

In the context of the existing literature examining traumatic death, recent revisions to Criterion A, and the aims of the present study, the following hypotheses were posited:

Hypothesis 1. Given the more restrictive language used in *DSM-5* to define learning about the death of a loved one as a traumatic event, it was predicted that among individuals who report this type of event, the overall prevalence of those who meet *DSM-5* Criterion A (i.e., VAD only) will be significantly lower than the prevalence of those who meet *DSM-IV* Criterion A1 (i.e., either SUD or VAD).

Based on literature indicating that events which involve direct exposure and include aspects of unpredictability, uncontrollability and life threat yield greater fear conditioning and increased PTSD symptoms, several predictions were made regarding differences among the three trauma groups.

Hypothesis 2. It was predicted that the MVA group will endorse greater PTSD symptom severity overall than the other two trauma groups. In addition, it was predicted that the MVA group will demonstrate greater symptom severity on PTSD symptoms most closely related to fear conditioning by having higher scores than the other two trauma groups on the hyperarousal symptom cluster and the specific symptoms of cued distress, cued physical reactions, effortful avoidance, hypervigilance, and startle.

Hypothesis 3. It was predicted that the VAD group will score higher than SUD on total symptom severity as well on as symptoms related to fear conditioning, because VAD involves violence and may be more likely to produce a conditioned fear response.

Hypothesis 4. Specific to the symptoms added in the *DSM-5* related to negative alterations to cognitions and mood, it was predicted that MVA and VAD will have higher scores on symptoms involving negative beliefs than SUD, because these events may be more likely to involve circumstances that violate individuals' assumptions about the world, people, and safety.

No specific hypotheses were made regarding differences in Personality Assessment Inventory clinical scales and subscale scores. These variables were included to provide additional information about possible differences in clinical presentation among the three groups.

Method

Participants and Procedure

Participants in Sample 1 were 1667 male and female undergraduate students recruited from psychology classes for one of seven research protocols between the years of 1999 and 2013. They completed a measure of trauma exposure -- either the Life Events Checklist (LEC; the trauma screener from the Clinician-Administered PTSD Scale; Blake et al., 1995) or the Traumatic Life Events Questionnaire (TLEQ; Kubany et al., 2000) -- and then completed the PTSD Checklist – specific version (PCL-S*;* Weathers et al., 1993). Participants were selected for subsequent analyses (n = 299) if they identified indirect exposure to (i.e., "learned about") the death of a friend or family member or direct exposure to (i.e., "happened to me") a motor vehicle accident as their worst stressful life event, and if their worst event met *DSM-IV* Criterion A1 or *DSM-5* Criterion A (see detailed explanation below).

Participants in Sample 2 were 2314 male and female undergraduate students recruited from psychology classes for one of three research protocols between the years of 2012 and 2013. As with Sample 1, participants in Sample 2 completed a measure of trauma exposure -- either the Life Events Checklist (LEC) or a modified version of the trauma exposure questions from the

Detailed Assessment of Posttraumatic Stress (DAPS; Briere, 2001) -- and then completed the PTSD Checklist for DSM-5 (PCL-5; Weathers, Litz, Keane, Palmieri, Marx, & Schnurr, 2012). Again, participants were selected for subsequent analyses (n = 387) if they identified indirect exposure to the death of a friend or family member or direct exposure to a motor vehicle accident as their worst stressful life event, and if their worst event met *DSM-IV* Criterion A1 or *DSM-5* Criterion A.

Measures were administered as part of larger research protocols in either a paper-and-pencil format or via Qualtrics, an online survey administration software. After providing informed consent, participants first completed a brief demographics form followed by questionnaires related to trauma exposure, PTSD symptoms and other psychosocial outcomes. A subset of participants also completed the Personality Assessment Inventory (PAI; Morey, 2007) a multiscale measure of psychopathology and personality. All participants were compensated with extra credit for completing the study.

Measures

Trauma Exposure. Trauma exposure was assessed in Sample 1 with either the Life Events Checklist (LEC), the self-report trauma assessment portion of the Clinician-Administered PTSD Scale (Blake et al., 1995) or the Traumatic Life Events Questionnaire (TLEQ; Kubany et al., 2000). The LEC consists of 17 items, including 16 items that assess exposure to specific categories of traumatic events (natural disaster, sexual assault, etc.) and one item, labeled "other," that assesses exposure to events that do not fit into one of the specific categories. Participants indicated their lifetime exposure to each of the categories of events by checking one or more of the following options: *Happened to me*, *Witnessed it*, *Learned about it*, *Not sure*, and *Does not apply*. Next, they identified the worst event (i.e., the one that had caused the most

difficulties), and reported whether that event involved elements required for *DSM-IV* Criterion A1 (i.e., actual or threatened death or serious injury, or a threat to the physical integrity of self or others) and Criterion A2 (i.e., intense fear, helplessness, or horror). Finally, participants provided a brief narrative of their worst event.

The TLEQ is a 23-item list of 22 specific potentially traumatic events and one category for "other events" with examples. For each event that the participant endorsed, they were asked whether they experienced "intense fear, helplessness, or horror when it happened" (i.e. Criterion A2). Participants then identified "the one event that causes you the most distress" and provided a brief description of the event.

In Sample 2, trauma exposure was assessed by either the LEC as previously described or a modified version of the trauma exposure assessment portion of the Detailed Assessment of Posttraumatic Stress (DAPS; Briere, 2001) designed to closely match *DSM-5* Criterion A. The original DAPS trauma screener consists of 14 items that review potentially traumatic events the participants may have experienced in their lifetimes including exposure to serious accidents, natural disasters, childhood physical or sexual abuse, and adult physical or sexual assault. Items were added for the current study to assess for indirect exposure to (i.e., learned about) serious injury, sexual assault, or violent or accidental death of a close friend or family member. These items were added to align with the indirect exposure traumas outlined in *DSM-5* Criterion A. Participants responded with "yes" or "no" to indicate if particular types of traumatic events had ever happened to them. For each endorsed event, participants indicated their perceived life threat at the time of the event and the medical care that they did or should have received. Participants also provided a brief narrative of their self-identified "worst" stressful life event.

A research team composed of a doctoral-level supervisor and two graduate students coded each worst-event narrative to determine (a) whether it provided enough information to make a determination regarding Criterion A, and if so (b) whether the event described met *DSM-IV* Criterion A1 or *DSM-5* Criterion A. The coding team created a priori definitions of SUD, VAD, and MVA based on the *DSM-IV* and *DSM-5* stressor criteria. SUD, i.e., an event meeting *DSM-IV* Criterion A1 but not *DSM-5* Criterion A, was defined as an event in which the participant learned about but did not witness the death or the deceased's body, the death was due to natural causes, the death occurred instantaneously or no more than seven days after the person was injured or became ill, and the deceased was a close friend or family member.

Participants whose event involved the death of a family member were included if the deceased was a first-degree relative (e.g., parent, sibling) or second-degree relative (e.g., grandparent, aunt/uncle, cousin), unless participants specifically noted that they were not close to this relative. Participants whose event involved the death of a friend were included if they described the deceased specifically as a close friend or otherwise indicated the importance of the relationship.

VAD, i.e., an event meeting both *DSM-IV* Criterion A1 and *DSM-5* Criterion A, was defined in the same way as SUD, except that the death was caused by some sort of accident or violence rather than natural causes. MVA was defined as an event in which the participant directly experienced (as opposed to witnessed or learned about) a transportation accident (typically a car accident) that was severe enough to produce actual or threatened serious injury or death. Narratives for qualifying events included elements such as the driver or passengers requiring immediate medical attention, passengers sustaining fatal injuries, the vehicle flipping, the vehicle spinning and ending up facing oncoming traffic, and the vehicle being "totaled," i.e.,

sustaining extensive structural damage. Participants who reported less serious accidents were excluded. Each event narrative was coded to indicate whether or not it met *DSM-IV* Criterion A1 and whether or not it met *DSM-5* Criterion A. Discrepancies in coding were resolved through consensus decisions reached among the graduate students and doctoral supervisor. Only those participants whose index trauma was determined by consensus to meet *DSM-IV* Criterion A1, *DSM-5* Criterion A, or both were included in the final samples.

PTSD Symptoms. In Sample 1, PTSD symptoms were measured with the PCL-S (Weathers et al., 1993). The PCL-S is a 17-item self-report measure that assesses each of the 17 *DSM-IV-TR* symptoms of PTSD. Referring to their worst event (i.e., SUD, VAD, or MVA), participants indicated how much they were bothered by each PTSD symptom in the past month, using a five-point scale (1 = *not at all* to 5 = *extremely*). The PCL-S and other versions of the PCL have been used extensively in a wide variety of trauma populations and have been shown to possess excellent psychometric properties (McDonald & Calhoun, 2010; Wilkins, Lang & Norman, 2011). In Sample 2, PTSD symptoms were measured with the PCL-5 (Weathers et al., 2013; Weathers et al., 2014), a revised version of the PCL that consists of 20 items corresponding to the 20 *DSM-5* PTSD symptoms. Similar to the PCL, participants indicated how much they were bothered by each symptom in the past month using a five-point scale (0 = *not at all* to 4 = *extremely*).

Personality Assessment Inventory. A subset of participants in Sample 1 (n = 113) and Sample 2 (n = 194) completed the PAI (Morey, 2007), a 334-item multiscale inventory assessing a broad range of psychopathology and personality traits. Respondents rate PAI items on a 4-point scale (*False* to *Very True*). PAI scales have consistently demonstrated high internal consistency, reliability, and convergent and discriminant validity (Morey, 2007). The following PAI scales,

which have been found to be related to PTSD in previous studies with undergraduates (e.g., McDevitt-Murphy, Weathers, Adkins, & Daniels, 2005), were analyzed: Anxiety (ANX), Anxiety Related Disorders – Traumatic Stress (ARD-T), Depression (DEP), Borderline Features (BOR), and Negative Impression Management (NIM).

Analytic Strategy

All analyses were conducted using Mplus Version 6.1 (Muthén & Muthén, 1998-2013) First, descriptive analyses for all measures, as well as prevalence rates for each index trauma group (i.e. sudden unexpected death, violent accidental death, and motor vehicle accident) were calculated (see Table 1). Second, cumulative odds ordinal logistic regression with proportional odds was conducted to determine the influence of trauma type on ratings of PTSD symptoms, as measured by the PCL in the Sample 1 and the PCL-5 in Sample 2. Because PCL and PCL-5 items are rated on an ordered categorical scale, standard linear regression could not be used because it requires a continuous dependent variable. Ordinal logistic regression is appropriate for analyses involving ordinal dependent variables. This type of regression is based on the assumption that the same regression coefficient can explain the relationship between the predictor variable and ordinal dependent variable across all categories of an ordinal dependent variable.

The categorical predictor variable in both samples, trauma type, comprised the three study groups, i.e., SUD, VAD, and MVA. Two sets of ordinal logistic regressions were run for each PCL and PCL-5 item using dummy coding for each of three study groups. The first set of analyses set VAD as the reference group to allow for a comparison between SUD and VAD. The second set of analyses set MVA as the reference group to allow for comparisons between each death-related trauma group and MVA. Third, standard linear regression was used to determine

whether trauma type predicts PAI scale scores because scale scores were assumed to be continuous dependent variables.

Given that maximum likelihood is the default estimation procedure for logistic regression in Mplus and many of the variables were not normally distributed (see Table 1), a Robust Maximum Likelihood (MLR) estimator was used for all analyses (Brown, 2006). In the first sample, the covariance coverage matrix indicated that the proportion of pairwise present data ranged from .97-.99 for the PCL analyses and from .34-38 for the PAI analyses. In the second sample, the covariance coverage matrix indicated that the proportion of pairwise present data ranged from .95-.99 for the PCL-5 analyses and from .47-.50 for the PAI analyses.

Missing data were due to a variety of factors including individual participants skipping one or more items of a measure. Also, as noted earlier, only a subset of participants completed the PAI, primarily because some studies from which participants were drawn did not include the PAI. All missing data were handled with Full Information Maximum Likelihood (FIML), which is considered the best practice for handling missing data (Enders, 2010). For the PCL analyses in the first sample and PCL-5 analyses in the second sample, age, gender, and all PAI clinical scales were included as auxiliary variables to inform FIML estimates. For the PAI analyses, PCL items in the first sample and PCL-5 items in the second sample were included as auxiliary variables.

Results

Descriptive Statistics

Sample 1 was predominately female (71.9%; *n* = 215), and the ethnic breakdown was 83.3 % European American/White (*n* = 249), 11.0% African American/Black (*n* = 33), 2.3% Asian American/Asian Origin (*n* = 7), 1.7% Latino/Hispanic (*n* = 5), and 1.0% Other (*n* = 3).

Age ranged from 17 to 28 (*M* = 20.1 years; *SD* = 1.6). Sample 2 also was predominately female (74.9%; *n* = 290) and had a similar ethnic breakdown, with 82.9% European American/White (*n* = 321), 9.0% African American/Black (*n* = 35), 3.1% Asian American/Asian Origin (*n* = 12), 2.8% Latino/Hispanic (*n* = 11), and 2.1% Other (*n* = 8). Age ranged from 18 to 54 (*M* = 20.1; *SD* = 2.9). Tables 1 and 2 present descriptive statistics for each measure included in the study.

Prevalence of Trauma Exposure

Of the 1667 participants reviewed for possible inclusion in Sample 1, 320 (19.2%) identified the death of a friend or family member as their worst event and 117 (10.6%) identified a motor vehicle accident. After coding of worst-event narratives, 160 (9.6%) met both *DSM-IV* Criterion A1 and *DSM-5* Criterion A for learning about the violent, accidental death of a close friend or family member (VAD). Further, 49 (2.9%) met *DSM-IV* Criterion A1 for learning about the sudden, unexpected death of a close friend or family member (SUD). However, these participants did not meet *DSM-5* Criterion A because SUD was specifically excluded in *DSM-5*. Finally, 90 (5.4%) met both *DSM-IV* Criterion A1 and *DSM-5* Criterion A for directly experiencing a motor vehicle accident (MVA). As predicted in Hypothesis 1, of the 209 participants who met *DSM-IV* Criterion A1 for either SUD or VAD, only 160 met *DSM-5* Criterion A for VAD, which is a 23% reduction in the number of participants who would be eligible for a PTSD diagnosis based on the death of a loved one.

Results were quite similar for Sample 2. Of the 2314 participants reviewed for possible inclusion in Sample 2, 388 (16.8%) identified death of a friend or family member as their worst event and 250 (10.8%) identified a motor vehicle accident. After coding of worst-event narratives, 184 (8.0%) met both *DSM-IV* Criterion A1 and *DSM-5* Criterion A for VAD; 32 (1.4%) met *DSM-IV* Criterion A1, but not *DSM-5* Criterion A, for SUD; and 171 (7.4%) met

both *DSM-IV* Criterion A1 and *DSM-5* Criterion A for MVA. As predicted, of the 216 participants who met *DSM-IV* Criterion A1 for either SUD or VAD, only 184 met *DSM-5* Criterion A for VAD, which is a 15% reduction in the number of participants who would be eligible for a PTSD diagnosis based on the death of a loved one.

Trauma Type Differences in *DSM-IV* PTSD Symptoms

In Sample 1, ordinal logistic regressions were conducted to determine the influence of trauma type on the distress related to *DSM-IV* PTSD symptoms. The results of these regressions are presented in Table 3. Dummy coding was used to evaluate all pairwise comparisons between the three trauma groups. Analyses were first run with VAD as the reference group to evaluate the comparison of VAD and SUD. Next, analyses were run with MVA as the reference group to evaluate the comparisons of SUD and VAD against MVA.

Ordinal logistic regressions yield odds ratios that indicate the extent to which one group is more likely than another group to be in a more severe rating category for a given symptom. Typically comparisons are constructed so that the expected odds ratios will be greater than one, and thus easier to interpret. However, in the present study the groups were not expected to demonstrate consistent differences across all PTSD symptoms, nor did they. Thus, in some cases, pairwise comparisons yielded odds ratios of less than one. To provide odds ratios that could be more easily understood, the reciprocal of such odds ratios were taken and reported in Table 3 in italics. Table 3 also presents means for the three groups; these help clarify which group is higher for a given comparison, but it should be emphasized that ordinal logistic regression does not test mean differences. Separate analyses were run for each of the 17 PCL items. In these analyses, trauma type had a statistically significant influence for 14 of the 17 symptoms.

Analyses focused first on the comparison of MVA relative to SUD and VAD for each PCL items (see Table 3). As predicted in Hypothesis 2, the odds of rating hypervigilance (PCL item 16) and startle (PCL item 17) as distressing were greater for the MVA group relative to the SUD group. Contrary to predictions, however, the odds of rating cued distress (PCL item 4) and avoidance of thoughts or feelings (PCL item 6), as distressing were greater for the SUD group relative to the MVA group. Although not specifically predicted, this was also the case for loss of interest (PCL item 9). Further, as predicted in Hypothesis 2, the odds of rating hypervigilance (PCL item 16) as distressing were greater for the MVA group relative to the VAD group.

Contrary to predictions, however, the odds of rating cued distress (PCL item 4), avoidance of thoughts or feelings (PCL item 6), and avoidance of reminders (PCL item 7), as distressing were all greater for the VAD group relative to the MVA group. Although not specifically predicted, this was also the case for trauma-related memories (PCL item 1), trauma-related dreams (PCL item 2), loss of interest (PCL item 9), detachment (PCL item 10), numbing (PCL item 11), sleep difficulty (PCL item 13), irritability (PCL item 14), and problems with concentration (PCL item 15).

Next, analyses focused on the comparison of SUD and VAD for each PCL item (see Table 3). As predicted in Hypothesis 3, the odds of rating cued physical reactions (PCL item 5), and startle (PCL item 17) as distressing were greater for the VAD group relative to the SUD group. Although not specifically predicted, this was also the case for trauma-related memories (PCL item 1).

Trauma Type Differences in *DSM-5* PTSD Symptoms

In Sample 2, ordinal logistic regressions were conducted to determine the influence of trauma type on distress related to *DSM-5* PTSD symptoms. The results of these regressions are

presented in Table 4. The same approach used in analyses for Sample 1 to evaluate pairwise comparisons and present odds ratios less than one was applied in the second sample. Separate analyses were used for each of the 20 PCL-5 items. As shown in Table 4, in these analyses trauma type had a statistically significant influence for 11 of the 20 symptoms.

Analyses again focused first on the comparison of MVA relative to SUD and VAD for each PCL-5 items (see Table 4). As predicted in Hypothesis 2, the odds of rating hypervigilance (PCL-5 item 17) as distressing were greater for the MVA group relative to the SUD group. Contrary to prediction, however, the odds of rating cued distress (PCL-5 item 4) as distressing were greater for the SUD group relative to the MVA group. Further, as predicted in Hypothesis 2, the odds of rating hypervigilance (PCL-5 item 17) as distressing were greater for the MVA group relative to the VAD group. Although not specifically predicted, this was also the case for flashbacks (PCL-5 item 3), amnesia (PCL-5 item 8), and negative beliefs (PCL-5 item 9).

Contrary to predictions, however, the odds of rating cued distress (PCL-5 item 4), avoidance of thoughts or feelings (PCL-5 item 6), and avoidance of reminders (PCL-5 item 7) as distressing were greater for the VAD group relative to the MVA group. Although not specifically predicted, this was also the case for trauma-related memories (PCL-5 item 1), experiencing no positive emotions (PCL-5 item 14), and engaging in aggressive behavior (PCL-5 item 15).

Next, analyses focused on the comparison of SUD and VAD for each PCL-5 item (see Table 4). There were only two significant differences between these groups, neither of which was specifically predicted. The odds of rating flashbacks (PCL-5 item 3) as distressing were greater for the SUD group relative to the VAD group, whereas the opposite was found for problems with concentration (PCL-5 item 19).

Trauma Type Differences in PTSD Symptom Clusters and PAI Scales

Linear regressions were conducted to examine group differences in PCL cluster scores in Sample 1, PCL-5 cluster scores in Sample 2, and selected PAI scales in both samples. As with the ordinal logistic regressions run on PCL and PCL-5 symptoms, dummy coding was used to evaluate all pairwise comparisons among the three groups for PTSD symptom clusters and PAI scales. In Sample 1, contrary to Hypothesis 2, the MVA group was not significantly higher than either the SUD group or VAD group on total PTSD severity or on the hyperarousal cluster specifically (see Table 5). In fact, the VAD group was significantly higher than the MVA group on total PTSD severity. Although not specifically predicted, the SUD group was higher than the MVA group on the avoidance/numbing cluster, and the VAD group was higher than the MVA group on all PCL clusters except Hyperarousal. Also contrary to predictions, there were no significant differences between the SUD and VAD groups on any of the PCL cluster scores. Finally, there were no significant differences between the three trauma groups on any of the PAI scales examined.

In Sample 2, again, contrary to Hypothesis 2, the MVA group was not significantly higher than either the SUD group or VAD group on total PTSD severity or on the hyperarousal cluster (see Table 6). Although not specifically predicted, the SUD group was significantly higher than the MVA group on the reexperiencing cluster, and the VAD group was significantly higher than the MVA group on the avoidance cluster. Again, contrary to predictions, there were no significant differences between the SUD and VAD groups on any of the PCL-5 cluster scores. Finally, there were no significant differences between the three trauma groups on any PAI scales.

Discussion

A prominent criticism of the *DSM-IV* PTSD criteria is that trauma is defined too broadly in Criterion A, thereby rendering too many individuals eligible for a PTSD diagnosis based on

relatively minor stressors. To address this concern, an effort was made to create a more restrictive definition of trauma in Criterion A for *DSM-5*, particularly by requiring that for events involving indirect exposure to the death of a loved one, the death must have been due to violent or accidental causes. In this study, the impact of this more restrictive definition was evaluated first by examining the prevalence of *DSM-IV* versus *DSM-5* Criterion A for events involving indirect exposure to the death of a loved one, and second by comparing SUD, VAD, and MVA groups on individual PTSD symptoms, PTSD symptom clusters, and selected PAI scales. In Sample 1 the groups were compared on *DSM-IV* PTSD symptoms; in Sample 2 they were compared on *DSM-5* PTSD symptoms.

The more restrictive definition had a substantial impact on the prevalence of events involving indirect exposure to the death of a loved one that met *DSM-5* Criterion A compared to *DSM-IV* Criterion A. In Sample 1, the number of participants who were eligible for a PTSD diagnosis based on their index event was reduced by 23% under the *DSM-5* definition. In Sample 2, the number of participants eligible for a PTSD diagnosis was reduced by 15% under the *DSM-5* definition. As predicted in Hypothesis 1, the revised Criterion A definition of indirect exposure to the death of a loved one clearly decreased the number of individuals who meet Criterion A based on this type of event and are thus eligible for a PTSD diagnosis.

Regarding the relationship between trauma type and PTSD severity, in both samples results indicated that trauma type was a significant predictor of PTSD severity. However, the pattern of results generally was not as predicted. Hypothesis 2 predicted that the MVA group would be higher than the SUD and VAD groups on total PTSD severity as well as on the hyperarousal symptom cluster in particular. Neither of these predictions were supported in either

sample, and in Sample 1 the VAD group actually scored higher than the MVA group on total PTSD severity.

Hypothesis 2 also predicted that the MVA group would be higher than both the SUD and VAD groups on specific symptoms indicative of fear conditioning. Some limited support was found for this prediction, primarily for hypervigilance. In Sample 1, the MVA group was significantly higher than both the SUD and VAD groups on hypervigilance and significantly higher than the SUD group on startle. Similarly, in Sample 2, the MVA group was significantly higher than both the SUD and VAD groups on hypervigilance.

Beyond that, though, this prediction was not supported, and there were even contradictory results. In Sample 1, both the SUD and VAD groups were significantly higher than the MVA group on cued distress and avoidance of thoughts or feelings, and the VAD group also was significantly higher than the MVA group on avoidance of reminders. In Sample 2, both the SUD and VAD groups again were significantly higher than the MVA group on cued distress, and the VAD group was significantly higher than the MVA group on avoidance of thoughts or feelings and avoidance of reminders.

Hypothesis 3 predicted that the VAD group would be higher than the SUD group on total PTSD severity, the hyperarousal cluster, and specific symptoms associated with fear conditioning. Only limited support was found for this prediction. In Sample 1, the VAD group was significantly higher than the SUD on cued physical reactions and startle. No other predicted differences were found between the SUD and VAD groups in either sample, and these groups significantly differed on only three additional symptoms overall.

Regarding group differences that were not specifically predicted, most notably the VAD group was significantly higher than the MVA group on eight additional symptoms (memories,

dreams, loss of interest, detachment, numbing, sleep difficulty, irritability, and problems with concentration) plus the reexperiencing and avoidance/numbing clusters and PTSD total severity in Sample 1, as well as three additional symptoms (memories, no positive emotions, and aggressive behavior) plus the avoidance cluster in Sample 2. In contrast, the SUD group was significantly higher than the MVA group only on one additional symptom (loss of interest) plus the avoidance/numbing cluster in Sample 1, as well as the reexperiencing cluster in Sample 2. Finally, no group differences were found in either sample for any of the PAI scales examined.

Thus, overall in Sample 1, although many of the pairwise differences were not statistically significant, the general pattern was that the VAD group had the highest scores, the SUD group was intermediate, and the MVA had the lowest scores. This was the case for 12 of 17 symptoms, two of three symptom clusters (reexperiencing and avoidance/numbing), and total PTSD severity. In Sample 2 the pattern was more variable between SUD and VAD, although MVA again generally had the lowest scores. SUD had the highest scores on eight symptoms and two clusters (reexperiencing and negative alterations), and was intermediate on seven more symptoms, one cluster (avoidance), and PTSD total severity. Similarly, VAD had the highest scores on eight symptoms, one cluster (avoidance), and PTSD total severity, and was intermediate on eight more symptoms and three clusters (reexperiencing, negative alterations, and hypervigilance).

Taken together these results suggest that, as intended by the narrowed definition in DSM-5, the VAD group is somewhat more symptomatic than the SUD group. Nonetheless, overall, these two groups were quite similar in symptom presentation. Further, with a few exceptions, both of these groups were generally more symptomatic than the MVA group. Therefore, based on these results, it does not appear to be warranted that SUD should be eliminated as a Criterion

A event on the basis that it is associated with fewer PTSD symptoms. As operationalized in the current study, SUD appears to be comparable to VAD in PTSD symptom presentation and associated with higher levels of PTSD than MVA, a widely accepted Criterion A event that involves directly experiencing a life-threatening situation. Given the substantial decrease in prevalence of Criterion A in *DSM-5* among individuals whose worst event involves indirect exposure to the death of a loved one, these findings are concerning. Individuals may now be excluded from a PTSD diagnosis despite their symptom presentation being comparable in severity to individuals who indirectly experienced a similar death event and to individuals who directly experienced a severe motor vehicle accident.

Regarding a possible conceptual basis for the pattern of results, two general patterns of group differences emerged. The first pattern was the tendency for both VAD and MVA, relative to SUD, to demonstrate higher levels of distress related to hyperarousal on an individual symptom level and symptom cluster level. This finding is consistent with the idea that some trauma types, especially those that involve violence or exposure to life threat, may confer a higher signal of threat and induce fear conditioning (Foa, et al., 1989; Foa, et al., 1992). The second pattern was that SUD and VAD, relative to MVA, were associated with higher levels of cued distress which is not consistent with previous literature. Because SUD and VAD necessarily involve death and only some of the MVA events involved death, this difference may reflect the impact of grief on the overall severity of symptom presentation. Together, these two patterns of results could be indicative of symptom discrepancies between PTSD and complicated grief put forth in the extant literature (Gray, et al., 2004). As comparisons related to complicated grief symptoms were outside the scope of the present study, further investigation into the differences

and similarities between the presentation of PTSD and complicated grief in the context of indirect exposure to the death of a loved one seems warranted.

One contribution of the present study is that it represents the first in-depth examination of the change to the stressor criterion definition related to the indirectly experienced sudden, unexpected death of a loved one in *DSM-5*. The current study used strictly defined comparison groups, including an unequivocal Criterion A event group (i.e. MVA), to rigorously examine potential item-level and symptom cluster-level differences on *DSM-IV* and *DSM-5* PTSD symptoms between SUD and groups who continue to qualify for Criterion A. Given that there is no debate about the status of MVA as a Criterion A event and few differences were found between SUD and MVA in the present study, the exclusion of SUD in *DSM-5* is called into question and necessitates further investigation.

This current study has several limitations. First, participants were recruited in a nonclinical setting and therefore endorsed lower levels of PTSD symptoms than would be expected in a clinical sample. Related to this concern, the distribution of scores on the PCL and PCL-5 did not reach the full possible range for each measure. However, there does not seem to be undue restriction of range, and ordinal logistic regression analyses were conducted using MLR estimation, which is robust to violations of the assumption of normality. Another concern is that data are based on self-report measures. Even though all measures, specifically the PCL and PCL-5, used in this study have demonstrated excellent psychometric properties, a structured PTSD interview would better manage potential response biases and might be helpful in determining, for example, whether cued distress refers primarily to grief versus conditioned fear.

Despite these limitations, findings from the present study contribute to the literature examining the relationship between Criterion A stressors and PTSD symptoms, particularly

related to the newest revision of the PTSD criteria for *DSM-5*. The present findings do not provide support for the most recent change in the definition of indirect-exposure, death-related traumatic events; rather, they suggest that the exclusion of a large percentage of sudden, expected deaths as traumatic events (i.e., those that are not violent or accidental) may be premature.

Additionally, the minor differences found between the SUD group and the other trauma groups suggest that further research is necessary to better understand this group of individuals who no longer qualify for a PTSD diagnosis. It is possible that the few differences found in hyperarousal symptoms may indicate an aspect of SUD that distinguishes it from other events that meet Criterion A despite exhibiting a similar overall PTSD symptom presentation. Although this study raises concerns about the exclusion of sudden, unexpected deaths from Criterion A, individuals who have experienced this type of event and present with clinically significant distress or impairment could qualify for a diagnosis of Other Specified Trauma- and Stressor – Related Disorder. In most cases, the disqualification from a PTSD diagnosis would not limit individuals from receiving treatment for their presenting concern. Although empirically supported treatments for PTSD were likely in previous use for individuals who experienced SUD and could likely still address their presenting concerns, the exclusion of SUD from *DSM-5* Criterion A should prompt treatment outcome research to determine whether these individuals are best served by treatments empirically supported for PTSD or might benefit from treatments that focus on grief.

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Table 1

Descriptive Statistics for PTSD Checklist and Personality Assessment Inventory in Sample 1

Scale	Items (*n*)	Possible Range	Observed Range	*M*	*SD*
PCL (*N* = 299)					
1 Memories	1	1-5	1-5	2.38	1.14
2 Dreams	1	1-5	1-5	1.88	1.11
3 Flashbacks	1	1-5	1-5	1.74	1.05
4 Cued distress	1	1-5	1-5	2.72	1.25
5 Cued physical reactions	1	1-5	1-5	1.94	1.18
6 Avoid thoughts/feelings	1	1-5	1-5	2.53	1.36
7 Avoid reminders	1	1-5	1-5	2.00	1.26
8 Amnesia	1	1-5	1-5	1.74	1.11
9 Loss of interest	1	1-5	1-5	1.46	0.97
10 Detachment	1	1-5	1-5	1.67	1.10
11 Numbing	1	1-5	1-5	1.61	1.09
12 Foreshortened future	1	1-5	1-5	1.72	1.16
13 Sleep	1	1-5	1-5	2.03	1.29
14 Irritability	1	1-5	1-5	1.76	1.11
15 Concentration	1	1-5	1-5	2.01	1.22
16 Hypervigilance	1	1-5	1-5	1.89	1.23
17 Startle	1	1-5	1-5	1.71	1.09
Total	17	17-85	17-83	32.85	13.32
Reexperiencing	5	5-25	5-25	10.69	4.67
Avoidance/Numbing	7	7-35	7-33	12.71	5.66
Hyperarousal	5	5-25	5-25	9.41	4.62
PAI (*N* = 114)					
NIM	9	0-110	44-107	52.90	13.98
ANX	24	34-103	36-90	56.79	11.19
ARD-T	8	41-99	41-92	55.53	12.05
DEP	24	35-110	25-96	54.55	12.66
BOR	24	32-104	37-91	56.51	11.50

Note. PCL = PTSD Checklist; PAI = Personality Assessment Inventory.

Table 2

Descriptive Statistics for PTSD Checklist–5 and Personality Assessment Inventory in Sample 2

Scale	Items (*n*)	Possible Range	Observed Range	*M*	*SD*
PCL-5 (*N* = 387)					
1 Memories	1	0-4	0-4	0.92	1.07
2 Dreams	1	0-4	0-4	0.56	0.90
3 Flashbacks	1	0-4	0-4	0.43	0.82
4 Cued distress	1	0-4	0-4	1.21	1.24
5 Cued physical reactions	1	0-4	0-4	0.70	1.12
6 Avoid thoughts/feelings	1	0-4	0-4	1.10	1.22
7 Avoid reminders	1	0-4	0-4	0.86	1.14
8 Amnesia	1	0-4	0-4	0.63	0.99
9 Negative beliefs	1	0-4	0-4	0.48	0.96
10 Blame	1	0-4	0-4	0.75	1.15
11 Negative emotions	1	0-4	0-4	0.80	1.08
12 Loss of interest	1	0-4	0-4	0.44	0.90
13 Detachment	1	0-4	0-4	0.51	0.97
14 No positive emotions	1	0-4	0-4	0.45	1.00
15 Aggressive behavior	1	0-4	0-4	0.44	0.79
16 Reckless behavior	1	0-4	0-4	0.30	0.74
17 Hypervigilance	1	0-4	0-4	0.84	1.20
18 Startle	1	0-4	0-4	0.57	0.98
19 Concentration	1	0-4	0-4	0.82	1.15
20 Sleep	1	0-4	0-4	0.84	1.12
Total	20	0-80	0-80	13.64	13.72
Reexperiencing	5	0-20	0-20	3.82	4.12
Avoidance	2	0-8	0-8	1.96	2.17
Negative Alternations	7	0-28	0-28	4.06	5.20
Hyperarousal	6	0-24	0-24	3.82	4.51
PAI (*N* = 194)					
NIM	9	0-110	44-96	50.14	9.94
ANX	24	34-103	37-98	55.35	10.70
ARD-T	8	41-99	41-94	52.79	11.59
DEP	24	35-110	35-88	52.70	11.30
BOR	24	32-104	35-80	53.48	10.26

Note. PCL-5 = PTSD Checklist - 5; PAI = Personality Assessment Inventory.

Table 3
Means, Standard Deviations, and Odds Ratios for PTSD Checklist Items for Three Trauma Groups in Sample 1

PCL item	SUD (*n*= 49) *M (SD)*	VAD (*n*= 160) *M (SD)*	MVA (*n*= 90) *M (SD)*	SUD vs. VAD *OR (95% CI)*	SUD vs. MVA *OR (95% CI)*	VAD vs. MVA *OR (95% CI)*
1 Memories	2.24 (1.13)	2.63 (1.16)	2.02 (1.01)	0.51 (0.28 – 0.93)* *1.96*	1.42 (0.75 – 2.68)	2.77 (1.71 – 4.48)*
2 Dreams	1.86 (1.14)	2.04 (1.16)	1.60 (0.94)	0.69 (0.37 – 1.28) *1.44*	1.64 (0.81 – 3.30)	2.38 (1.42 – 3.99)*
3 Flashbacks	1.78 (1.05)	1.81 (1.11)	1.61 (0.94)	0.99 (0.54 – 1.81) *1.01*	1.42 (0.72 – 2.79)	1.43 (0.84 – 2.41)
4 Cued distress	2.69 (1.28)	3.08 (1.17)	2.10 (1.14)	0.57 (0.30 – 1.05) *1.75*	2.76 (0.29 – 1.74)*	4.89(1.07 – 2.10)*
5 Cued physical reactions	1.65 (1.09)	2.03 (1.20)	1.94 (1.18)	0.46 (0.24 – 0.92)* *2.17*	0.54 (0.26 – 1.13) *1.85*	1.17 (0.72 – 1.90)
6 Avoid thoughts/feelings	2.65 (1.41)	2.84 (1.36)	1.89 (1.08)	0.77 (0.42 – 1.43) *1.30*	2.86 (1.47 – 5.57)*	3.71 (2.33 – 5.91)*

(continued)

PCL item	SUD (*n*= 49) *M (SD)*	VAD (*n*= 160) *M (SD)*	MVA (*n*= 90) *M (SD)*	SUD vs. VAD *OR (95% CI)*	SUD vs. MVA *OR (95% CI)*	VAD vs. MVA *OR (95% CI)*
7 Avoid reminders	2.04 (1.35)	2.13 (1.30)	1.74 (1.10)	0.79 (0.41 – 1.51) *1.27*	1.51 (0.74 – 3.09)	1.91 (1.16 – 3.15)*
8 Amnesia	1.63 (1.13)	1.67 (1.02)	1.93 (1.24)	0.74 (0.35 – 1.55) *1.35*	0.50 (0.23 – 1.09) *2.00*	0.67 (0.41 – 1.10) *1.49*
9 Loss of interest	1.57 (1.10)	1.58 (1.05)	1.19 (0.66)	0.94 (0.47 – 1.88) *1.06*	3.55 (1.41 – 8.98)*	3.77 (1.76 – 8.19)*
10 Detachment	1.76 (1.32)	1.85 (1.16)	1.29 (0.73)	0.58 (0.27 – 1.28) *1.72*	2.11 (0.87 – 5.11)	3.61 (2.01 – 6.48)*
11 Numbing	1.59 (1.19)	1.79 (1.20)	1.29 (0.73)	0.55 (0.26 – 1.18) *1.82*	1.64 (0.69 – 3.92)	3.00 (1.64 – 5.48)*
12 Foreshortened future	1.92 (1.35)	1.78 (1.19)	1.51 (0.96)	1.16 (0.60 – 2.24)	1.92 (0.93 – 4.00)	1.66 (0.97 – 2.84)
13 Sleep	1.88 (1.38)	2.23 (1.36)	1.76 (1.05)	0.50 (0.25 – 0.98) *2.00*	0.92 (0.45 – 1.89) *1.09*	1.85 (1.16 – 2.96)*

(continued)

PCL item	SUD (*n*= 49) *M (SD)*	VAD (*n*= 160) *M (SD)*	MVA (*n*= 90) *M (SD)*	SUD vs. VAD *OR (95% CI)*	SUD vs. MVA *OR (95% CI)*	VAD vs. MVA *OR (95% CI)*
14 Irritability	1.80 (1.26)	1.92 (1.17)	1.45 (0.81)	0.67 (0.33 – 1.37)	1.56 (0.72 – 3.38)	2.33 (1.40 – 3.89)*
				1.49		
15 Concentration	1.92 (1.13)	2.26 (1.32)	1.61 (0.96)	0.64 (0.36 – 1.12)	1.79 (0.96 – 3.35)	2.81 (1.71 – 4.64)*
				1.56		
16 Hypervigilance	1.59 (1.15)	1.81 (1.17)	2.18 (1.32)	0.56 (0.27 – 1.16)	0.31 (0.15 – 0.68)*	0.56 (0.35 – 0.91)*
				1.79	*3.23*	*1.79*
17 Startle	1.35 (0.75)	1.73 (1.10)	1.87 (1.20)	0.43 (0.71 – 2.01)*	0.36 (0.17 – 0.77)*	0.84 (0.50 – 1.40)
				2.33	*2.78*	*1.19*

Note. PCL = PTSD Checklist; SUD = sudden unexpected death; VAD = violent or accidental death; MVA = motor vehicle accident; OR = odds ratio; CI = confidence interval. Italics indicate reciprocal OR.
*$p < .05$

Table 4
Means, Standard Deviations, and Odds Ratios for PTSD Checklist-5 Items for Three Trauma Groups in Sample 2

PCL-5 item	SUD (*n*= 32) *M (SD)*	VAD (*n*= 184) *M (SD)*	MVA (*n*= 171) *M (SD)*	SUD vs. VAD *OR (95% CI)*	SUD vs. MVA *OR (95% CI)*	VAD vs. MVA *OR (95% CI)*
1 Memories	1.23 (1.31)	1.02 (1.10)	0.76 (0.96)	1.28 (0.60 – 2.73)	1.96 (0.92 – 4.20)	1.54 (1.05 – 2.26)*
2 Dreams	0.61 (0.88)	0.57 (0.90)	0.54 (0.91)	1.16 (0.55 – 2.47)	1.27 (0.60 – 2.73)	1.10 (0.71 – 1.68)
3 Flashbacks	0.81 (1.20)	0.34 (0.75)	0.45 (0.79)	2.75 (1.13 – 6.70)*	1.72 (0.72 – 4.11)	0.63 (0.39 – 1.00)* *1.59*
4 Cued distress	1.71 (1.49)	1.43 (1.23)	0.88 (1.11)	1.35 (0.63 – 2.92)	3.35 (1.53 – 7.31)*	2.48 (1.68 – 3.66)*
5 Cued physical reactions	0.87 (1.36)	0.74 (1.16)	0.64 (1.02)	1.05 (0.44 – 2.21)	1.15 (0.48 – 2.78)	1.09 (0.72 – 1.65)
6 Avoid thoughts/feelings	1.00 (1.37)	1.27 (1.20)	0.94 (1.19)	0.55 (0.37 – 0.80) *1.82*	1.01 (0.44 – 2.31)	1.83 (1.24 – 2.71)*

(continued)

PCL-5 item	SUD (*n*= 32) *M (SD)*	VAD (*n*= 184) *M (SD)*	MVA (*n*= 171) *M (SD)*	SUD vs. VAD *OR (95% CI)*	SUD vs. MVA *OR (95% CI)*	VAD vs. MVA *OR (95% CI)*
7 Avoid reminders	0.70 (1.12)	1.03 (1.20)	0.70 (1.05)	0.55 (0.26 – 1.16) *1.82*	0.98 (0.46 – 2.09) *1.02*	1.79 (1.19 – 2.67)*
8 Amnesia	0.68 (1.14)	0.47 (0.79)	0.79 (1.13)	1.38 (0.65 – 2.93)	0.80 (0.38 – 1.70) *1.25*	0.58 (0.38 – 0.89)* *1.72*
9 Negative beliefs	0.45 (0.85)	0.57 (1.02)	0.39 (0.90)	0.95 (0.47 – 1.95) *1.05*	1.61 (0.76 – 3.40)	1.69 (1.03 – 2.76)*
10 Blame	0.71 (1.10)	0.62 (1.01)	0.91 (1.28)	1.08 (0.49 – 2.37)	0.74 (0.34 – 1.65) *1.35*	0.69 (0.46 – 1.04) *1.45*
11 Negative emotions	0.71 (1.01)	0.84 (1.08)	0.77 (1.09)	0.78 (0.37 – 1.62) *1.28*	0.94 (0.44 – 1.99) *1.06*	1.21 (0.81 – 1.81)
12 Loss of interest	0.58 (1.15)	0.50 (0.93)	0.36 (0.82)	0.95 (0.38 – 2.37) *1.05*	1.45 (0.56 – 3.71)	1.53 (0.94 – 2.49)
13 Detachment	0.71 (1.07)	0.58 (1.04)	0.41 (0.86)	1.42 (0.67 – 3.03)	2.02 (0.94 – 4.36)	1.42 (0.89 – 2.27)

(continued)

PCL-5 item	SUD (*n*= 32) *M (SD)*	VAD (*n*= 184) *M (SD)*	MVA (*n*= 171) *M (SD)*	SUD vs. VAD *OR (95% CI)*	SUD vs. MVA *OR (95% CI)*	VAD vs. MVA *OR (95% CI)*
14 No positive emotions	0.52 (0.96)	0.53 (1.06)	0.35 (0.93)	1.00 (0.43 – 2.34)	1.76 (0.72 – 4.27)	1.76 (1.05 – 2.96)*
15 Aggressive behavior	0.52 (0.85)	0.53 (1.06)	0.32 (0.69)	0.92 (0.40 – 2.14) *1.09*	1.72 (0.72 – 4.09)	1.87 (1.18 – 2.96)*
16 Reckless behavior	0.35 (0.80)	0.27 (0.72)	0.32 (0.77)	1.40 (0.52 – 3.78)	1.07 (0.40 – 2.85)	0.77 (0.44 – 1.34) *1.30*
17 Hypervigilance	0.42 (0.92)	0.77 (1.17)	0.99 (1.26)	0.46 (0.19 – 1.13) *2.17*	0.31 (0.13 – 0.74)* *3.23*	0.66 (0.44 – 0.99)* *1.52*
18 Startle	0.35 (0.71)	0.52 (0.99)	0.65 (1.01)	0.80 (0.35 – 1.83) *1.25*	0.53 (0.24 – 1.20) *1.89*	0.66 (0.43 – 1.03) *1.52*
19 Concentration	0.43 (0.77)	0.87 (1.15)	0.83 (1.20)	0.47 (0.22 – 1.00)* *2.13*	0.54 (0.25 – 1.17) *1.85*	1.15 (0.77 – 1.74)
20 Sleep	0.61 (1.12)	0.93 (1.25)	0.79 (1.20)	0.55 (0.25 – 1.20) *1.82*	0.72 (0.32 – 1.58) *1.39*	1.30 (0.87 – 1.95)

Note. PCL-5 = PTSD Checklist-5; SUD = sudden unexpected death; VAD = violent or accidental death; MVA = motor vehicle accident; OR = odds ratio; CI = confidence interval. Italics indicate reciprocal OR.
*$p < .05$

Table 5

Means, Standard Deviations, and Regression Coefficients for PTSD Checklist Clusters and Personality Assessment Inventory Scales for Three Trauma Groups in Sample 1

	SUD (*n*= 49)	VAD (*n*= 160)	MVA (*n*= 90)	SUD vs. VAD		SUD vs. MVA		VAD vs. MVA	
PCL cluster	*M (SD)*	*M (SD)*	*M (SD)*	*B (SE)*	*β*	*B (SE)*	*β*	*B (SE)*	*β*
Reexperiencing	10.22 (4.47)	11.61 (4.80)	9.31 (4.21)	-1.38 (0.74)	-0.11	0.92 (0.77)	0.07	2.30 (0.59)*	0.25*
Avoidance/ Numbing	13.16 (6.47)	13.63 (5.89)	10.84 (4.21)	-0.47 (1.03)	-0.03	2.32 (1.02)*	0.15*	2.79 (0.65)*	0.25*
Hyperarousal	8.53 (4.59)	9.96 (4.92)	8.90 (3.94)	-1.43 (0.76)	-0.12	-0.37 (0.77)	-0.03	1.06 (0.57)	0.11
Total	31.92 (14.14)	35.23 (13.91)	29.15 (10.77)	-3.31 (2.29)	-0.09	2.77 (2.31)	0.08	6.08 (1.60)*	0.23*
	SUD (*n* = 19)	VAD (*n* = 48)	MVA (*n* = 40)	SUD vs. VAD		SUD vs. MVA		VAD vs. MVA	
PAI scale	*M (SD)*	*M (SD)*	*M (SD)*	*B (SE)*	*β*	*B (SE)*	*β*	*B (SE)*	*β*
NIM	54.80 (17.84)	53.65 (13.00)	51.07 (14.23)	1.15 (4.28)	0.03	3.73 (4.38)	0.10	2.58 (0.96)	0.09
ANX	56.26 (12.21)	57.67 (11.38)	56.00 (10.67)	-1.40 (3.17)	-0.05	0.26 (3.20)	0.01	1.67 (2.33)	0.07
ARD-T	54.90 (13.51)	56.52 (12.06)	54.60 (11.52)	-1.62 (3.38)	0.63	0.31 (3.43)	0.01	1.92 (2.41)	0.08

(continued)

	SUD (*n* = 19)	VAD (*n* = 48)	MVA (*n* = 40)	SUD vs. VAD		SUD vs. MVA		VAD vs. MVA	
	M (SD)	*M (SD)*	*M (SD)*	*B (SE)*	*β*	*B (SE)*	*β*	*B (SE)*	*β*
DEP	51.72 (11.71)	55.33 (12.65)	54.89 (13.23)	-3.61 (3.23)	-0.11	-3.17 (3.42)	-0.10	0.44 (2.78)	0.02
BOR	55.40 (14.66)	56.26 (10.61)	57.38 (11.04)	-0.86 (3.52)	-0.03	-1.98 (3.63)	-0.07	-1.12 (2.28)	-0.05

Note. SUD = sudden unexpected death; VAD = violent or accidental death; MVA = motor vehicle accident; PAI = Personality Assessment Inventory; NIM = Negative Impression; ANX = Anxiety; ARD-T = Traumatic Stress; DEP = Depression; BOR = Borderline Features; B = unstandardized regression coefficient; SE = standard error; β = standardized regression coefficient.
*$p < .05$

Table 6

Means, Standard Deviations, and Regression Coefficients for PTSD Checklist-5 Clusters and Personality Assessment Inventory Scales for Three Trauma Groups in Sample 2

	SUD (*n*= 32)	VAD (*n*= 184)	MVA (*n*= 171)	SUD vs. VAD		SUD vs. MVA		VAD vs. MVA	
PCL-5 cluster	*M (SD)*	*M (SD)*	*M (SD)*	*B (SE)*	*β*	*B (SE)*	*β*	*B (SE)*	*β*
Reexperiencing	5.23 (5.29)	4.08 (4.01)	3.28 (3.92)	1.14 (0.98)	0.08	1.94 (0.98)*	0.13*	0.80 (0.42)	0.10
Avoidance	1.70 (2.35)	2.30 (2.19)	1.64 (2.08)	-0.60 (0.45)	-0.07	0.07 (0.45)	0.01	0.67 (0.23)*	0.15*
Negative alterations	4.35 (5.71)	4.12 (5.33)	3.94 (4.98)	0.23 (1.08)	0.01	0.41 (1.08)	0.02	0.18 (0.55)	0.02
Hyperarousal	2.60 (3.54)	3.91 (4.76)	3.94 (4.36)	-1.31 (0.73)	-0.08	-1.34 (0.72)	-0.08	-0.03 (0.49)	-0.00
Total	13.52 (15.32)	14.48 (13.94)	12.79 (13.23)	-0.96 (2.99)	-0.02	0.73 (2.98)	0.01	1.69 (1.47)	0.06
	SUD (*n*= 15)	VAD (*n*= 89)	MVA (*n*=42)	SUD vs. VAD		SUD vs. MVA		VAD vs. MVA	
PAI scale	*M (SD)*	*M (SD)*	*M (SD)*	*B (SE)*	*β*	*B (SE)*	*β*	*B (SE)*	*β*
NIM	50.73 (12.29)	50.01 (9.35)	50.17 (10.20)	0.72 (3.22)	0.02	0.57 (3.25)	0.02	-0.16 (1.46)	-0.01
ANX	55.32 (7.63)	55.79 (10.68)	54.95 (11.20)	-0.47 (2.29)	-0.01	0.37 (2.29)	0.01	0.84 (1.67)	0.04
ARD-T	53.27 (13.77)	53.34 (12.13)	52.18 (10.74)	-0.07 (3.67)	-0.00	1.09 (3.62)	0.03	1.16 (1.71)	0.05
DEP	52.40 (13.13)	52.60 (11.07)	52.84 (11.34)	-0.21 (3.48)	-0.01	-0.44 (3.49)	-0.01	-0.24 (1.68)	-0.01
BOR	54.13 (9.91)	53.95 (9.85)	52.89 (10.80)	0.18 (2.69)	0.01	1.24 (2.73)	0.03	1.06 (1.58)	0.05

Note. SUD = sudden unexpected death; VAD = violent or accidental death; MVA = motor vehicle accident; PAI = Personality Assessment Inventory; NIM = Negative Impression; ANX = Anxiety; ARD-T = Traumatic Stress; DEP = Depression; BOR = Borderline Features; B = unstandardized regression coefficient; SE = standard error; β = standardized regression coefficient.
*$p < .05$