Methodological Considerations for Assessing Trauma History via Self-report

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Acknowledgements

We thank Erin Stevens for her valuable feedback and assistance in editing this manuscript.
Abstract

Objective: One must first experience a traumatic event (Criterion A in the Diagnostic and Statistical Manual of Mental Disorders [DSM-5]; APA, 2013) to be diagnosed with posttraumatic stress disorder (PTSD). Standard procedures for assessing Criterion A (i.e., the “worst-event” method) may result in misidentification of trauma exposure status. The purpose of this internet-based study was to obtain an estimate of the percent of an adult sample that is misidentified as non-Criterion A through use of this method. Method: Two separate samples completed the extended version of the Life Events Checklist for DSM-5 (LEC-5; Weathers, Blake et al., 2013b). Sample 1 participants (N = 579) completed the LEC-5 via the traditional worst-event method, while Sample 2 participants (N = 569) completed follow-up questions for every event endorsed on the LEC-5, as well as a measure of posttraumatic stress symptoms. Results: The majority of each sample identified a worst event that met criterion A (Sample 1 = 58.5%; Sample 2 = 54.3). Of the 202 participants in Sample 2 whose worst event did not meet Criterion A, 69.6% reported at least one other Criterion A event. Additionally, posttraumatic stress symptoms (i.e., severity and factor structure) in Sample 2 did not differ between those with a worst event that met Criterion A and those with a secondary event that met Criterion A, even though the identified worst event did not. Conclusions: When assessing trauma exposure via self-report, a written narrative and follow-up questions should be requested for all events that are endorsed.

Keywords: trauma, PTSD, exposure, Life Events Checklist, worst event.
Clinical Impact Statement

Failure to accurately identify individuals who have a history of trauma exposure may have serious consequences for those suffering with psychopathology (e.g., decisions related to treatment, disability benefits, etc.). Results from the present study suggest that a substantial portion of those who have experienced a traumatic event are misidentified through use of the worst-event method. To address this issue, we suggest requiring individuals who are assessed for trauma history via self-report to provide a written narrative and follow-up questions (e.g., exposure to actual or threatened death, serious injury, or sexual violence; APA, 2013) for all events that are endorsed.
Methodological Considerations for Assessing Trauma History via Self-report

Posttraumatic stress disorder (PTSD) is one of the few disorders outlined in the *Diagnostic and Statistical Manual of Mental Disorders (DSM-5)*; American Psychiatric Association [APA], 2013) for which etiology is part of the definition; exposure to a *traumatic event* (defined by Criterion A; APA, 2013) is necessary for a diagnosis of PTSD. Failure to accurately identify individuals who have a history of trauma exposure may have a negative impact on research, theory, and clinical practice. For example, it is possible for one to exhibit PTSD symptoms sufficient for a diagnosis of PTSD (Criteria B through H) in the absence of a traumatic event as defined by the DSM-5 (APA, 2013). This particular situation precludes a diagnosis of PTSD and may have serious consequences for those suffering with psychopathology (e.g., decisions related to treatment, disability benefits, etc.). Given that the definition of trauma has been the topic of heated debate for more than two decades (e.g., May & Wisco, 2016; McNally, 2004; Robinson & Larson, 2010; Weathers & Keane, 2007), the purpose of the present study was not to rehash this debate, but to examine the effect that the most commonly used self-report method for assessing trauma history (i.e., worst-event method via the Life Events Checklist for DSM-5 [LEC-5]; Weathers, Blake et al., 2013b) has on accurately identifying trauma victims as per the DSM-5 (APA, 2013).

For the standard version of the LEC-5 (Weathers, Blake et al., 2013b), participants are provided with a list of 16 potentially traumatic events (e.g., sexual assault, motor vehicle accident, physical assault) and asked to indicate whether each event happened to them, they witnessed it, they learned about it, it was part of their job, or the event was not personally applicable. Participants are also able to indicate whether they have experienced “any other very stressful event or experience” that is not otherwise captured by the list. From the events reported,
participants are asked to identify the one event that currently bothers them the most and reference that event when completing the companion self-report measure of posttraumatic stress symptoms (i.e., PTSD Checklist-5 [PCL-5]; Weathers, Litz et al., 2013). This approach may result in inflated estimates of trauma prevalence because follow-up questions are not provided that would help to determine whether the endorsed event(s) meet Criterion A (e.g., exposure to actual or threatened death, serious injury, or sexual violence; APA, 2013). Without the use of follow-up questions to further assess Criterion A, participants may complete the PCL-5 in reference to an event that is not considered traumatic, which is a serious concern when making inferences regarding posttraumatic stress symptomatology. For example, Anders, Shallcross, and Frazier (2012) found that non-Criterion A relational events (e.g., infidelity) were the most commonly identified worst events even though the majority of participants who identified these events as worst also reported experiencing additional events that would meet Criterion A (e.g., sexual assault).

This issue is likely further compounded by changes to Criterion A that were made in DSM-5 (APA, 2013). Specifically, whereas indirect exposure to the death of family member or close friend could be considered traumatic in DSM-IV if the individual in question died suddenly of natural causes, this is not the case in DSM-5, which requires the actual or threatened death of a family member or close friend to be “violent or accidental.” This is particularly problematic because indirect exposure to nonviolent/nonaccidental death is frequently identified as the worst, or most bothersome event relative to other event types (Breslau et al., 1998; Keyes et al., 2014). Kilpatrick et al. (2013) found that 60% of cases that met DSM-IV, but not DSM-5, Criterion A were due to this specific change. With that in mind, completers of the standard version of the LEC-5 (Weathers, Blake et al., 2013b) may endorse indirect exposure to events, such as “severe
human suffering” or “serious accidental death,” that would not meet the “violent or accidental” standard set forth in DSM-5 (e.g., a family member who has a long battle with cancer or dies from a heart attack). Again, without additional probing, the individual who endorses “severe human suffering” in relation to a family member who passes away from cancer, would then go on to complete the PCL-5 in reference to an event that is not considered traumatic under the DSM-5 definition.

Fortunately, Weathers, Blake et al. (2013b) developed an extended version of the LEC-5 to address the concern that events endorsed on the standard version may not actually meet Criterion A. This version of the LEC-5 also uses the worst-event method; participants are asked to identify the event that currently bothers them the most from all events endorsed on the standard LEC-5 screening page. Participants are then asked to provide a written narrative (e.g., what happened, who was involved) and answer a series of questions related to the event. Specifically, participants are asked how the event was experienced, whether the event (a) involved danger to someone’s life, (b) involved serious injury or death, (c) involved sexual violence, and (d) was accidental, violent, or due to natural causes in the case of death of a close friend or family member.

The extended version of the LEC-5 addresses a number of issues with using the standard version of the LEC-5 to identify trauma exposure. However, follow-up questions are typically only asked in relation to the identified worst event (Bardeen & Daniel, 2017; Blevins, Weathers, Davis, Witte, & Domino, 2015; Maheux & Price, 2016; Price, Kuhn, Hoffman, Ruzek, & Acierno, 2015). This is potentially problematic because evidence suggests that the majority of trauma survivors have experienced more than one event (Breslau et al., 1998; Elhai et al., 2009; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995; Kilpatrick et al., 2013). In fact, because
multi-trauma exposure is the rule, not the exception, DSM-5 (APA, 2013) was revised to acknowledge that PTSD symptoms might arise from multiple traumatic events (i.e., composite PTSD; Kilpatrick et al., 2013). This highlights the need to acquire enough information regarding all endorsed events to increase confidence that those who have experienced a traumatic event (as per the DSM-5) are correctly identified.

The purpose of the present study was to obtain an estimate of the percent of a general population sample that is misidentified as non-Criterion A through use of the worst-event method. Two separate samples completed the extended version of the LEC-5 online to address this aim. Participants in Sample 1 completed the LEC-5 via the traditional worst-event method. For Sample 2, conditional branching (i.e., If/Then statements used to determine the presentation of survey questions) was used so that the LEC-5’s follow-up questions and narratives were required for every event that a participant endorsed. This allowed us to determine the frequency of cases in which Criterion A was not met for the selected worst event, but was met for other endorsed events.

Based on evidence that scores on the PCL, as well as the factor structure of posttraumatic stress symptomatology (DSM-5’s four-factor model; APA, 2013), do not differ as a function of whether symptoms are reported to a specific event or in reference to one’s trauma history as a whole (i.e., trauma-general; Elhai et al., 2009), participants in Sample 2 completed the PCL-5 in a trauma-general fashion. This approach is consistent with the recent revision to DSM-5 in which it is acknowledged that PTSD symptoms might arise from multiple trauma types, as well recent calls for the field to move beyond anchoring posttraumatic stress symptoms to a single event (Karam et al., 2014; Kilpatrick et al., 2013; Smith, Summers, Dillon, & Cougle, 2016). As an exploratory aim of the present study, we sought to examine whether posttraumatic stress
symptoms (i.e., severity and factor structure) in Sample 2 differed between those whose worst event met Criterion A (i.e., worst event Criterion A group) and those with a secondary event that met Criterion A even though the identified worst event did not (i.e., secondary Criterion A group).

Method

Participants and Procedure

Two independent samples of general population adults were recruited as part of two larger studies (Sample 1: $N = 579$, Sample 2: $N = 569$; recruited via Amazon Mechanical Turk [MTurk]). Participants in both studies completed a battery of self-report measures. MTurk is an Internet-based platform that provides participants with the opportunity to complete questionnaires for financial compensation. Evidence suggests that MTurk data is of high quality (e.g., Behrend, Sharek, Meade, & Wiebe, 2011; Buhrmester, Kwang, & Gosling, 2011; Paolacci, Chandler, & Ipeirotis, 2010; Shapiro, Chandler, & Mueller, 2013). Moreover, MTurk samples are more demographically diverse than undergraduate samples (Buhrmester et al., 2011) and internet samples of community adults have been used to examine trauma and posttraumatic symptoms in prior research (e.g., Seligowski & Orcutt, 2016). A secure online survey program was used to administer informed consent and self-report measures. Participants in both samples were compensated $1.50 for completing study questionnaires.

The average age and sex makeup of each sample is as follows: Sample 1 = 35.6 years ($SD = 11.3$) and 58.7% female; Sample 2 = 34.94 years ($SD = 10.6$) and 58.7% female. In Sample 1, 82.0% self-identified as White, 9.2% as Black, 5.7% as Asian, 0.3% as American Indian or Alaska Native, 2.8% endorsed “other,” and 7.9% of Sample 1 identified their ethnicity as Hispanic. In Sample 2, 81.7% self-identified as White, 8.4% as Asian, 7.0% as Black, 1.6% as
Native American, 1.2% endorsed “other,” and 7.4% of Sample 2 identified their ethnicity as Hispanic.

**Self-report Measures**

**Life Events Checklist for DSM-5 (LEC-5) Extended Version.** As described, the LEC-5 (Weathers, Blake et al., 2013b) assesses exposure to 17 potentially traumatic events (e.g., sexual assault, motor vehicle accident, physical assault). For each event, respondents are asked to indicate whether the event happened to them, they witnessed it, they learned about it, it was part of their job, they are unsure, or the event did not apply to them. Participants in Sample 1 were asked to provide a brief narrative of the event from those endorsed on the screening page that was the worst. They then answered the series of follow-up questions designed to clarify whether the endorsed event met Criterion A (e.g., exposure to actual or threatened death, serious injury, or sexual violence; APA, 2013). Consistent with the procedure used with Sample 1, participants in Sample 2 were asked to identify any of the 17 potentially traumatic events that they had experienced (i.e., the event happened to them, they witnessed it, they learned about it, etc.). In contrast to the procedure used with Sample 1, participants in Sample 2 provided narratives and completed follow-up questions for all events endorsed on the LEC-5 in the order that they appeared on the screening page. For example, a participant who endorsed experiencing items 1, 2, and 3 on the LEC screening page would then go onto complete the narrative and follow-up questions for those specific items in order (i.e., 1, 2, 3). After completing follow-up questions, participants in Sample 2 were asked to identify the event from those endorsed that they considered the worst. Participants in Sample 2 were asked to complete the PCL-5 in a trauma-general fashion. Narrative responses were reviewed in conjunction with LEC follow-up questions for all endorsed events to identify inconsistencies and patterns of responding indicative
of inattentiveness (e.g., checking the “accident or violence” box for the item asking if the loss of a loved one was accidental, violent, or due to natural causes and simultaneously providing a narrative that reports death due to chronic illness).

**PTSD Checklist-5-Civilian Version (PCL-5).** The PCL-5 (Weathers, Litz et al., 2013) is a 20-item self-report measure designed to assess B, C, D, and E of the DSM-5 PTSD criteria (APA, 2013). Participants in Sample 2 rated how much they have been bothered by each symptom in the past month (0 = *not at all* to 4 = *extremely*), with higher scores indicating greater posttraumatic stress symptoms. Consistent with evidence suggesting that PTSD is a dimensional construct rather than a discrete clinical syndrome (e.g., Broman-Fulks et al., 2006; Forbes, Haslam, Williams, & Creamer, 2005; Ruscio, Ruscio, & Keane, 2002), items were summed to create both total and cluster scores. The PCL-5 has demonstrated adequate psychometric properties, including internal consistency, retest reliability over a one-week period, and convergent and discriminant validity (Blevins et al., 2015). Internal consistency of the total score and subscales scores was adequate in participants from both subsamples from Sample 2 (i.e., worst event Criterion A group: total core \( \alpha = .97 \), subscale scores from .89 to .93; secondary Criterion A group: total core \( \alpha = .95 \), subscale scores from .85 to .91).

**Data Analytic Strategy**

SPSS (IBM SPSS, Version 23.0) was used to compute descriptive statistics (i.e., Criterion A event endorsement) and conduct means difference testing (i.e., independent samples t-tests to examine between-groups differences in PCL-5 scores). A series of confirmatory factor analyses (CFAs) were conducted using Mplus 7.4 (Muthen & Muthen, 2015). Mean- and variance-adjusted weighted least squares (WLSMV) estimation was used to test all models because PCL-5 item responses are ordered categories (Asparouhov, 2005). Before testing
measurement invariance, the fit of the DSM-5 defined model of posttraumatic stress
symptomatology (i.e., correlated four-factor model of PTSD) was first examined for all of the
participants in Sample 2 who had at least one Criterion A event. This model consists of five
items with primary loadings on Factor I (Intrusion), two items with primary loadings on Factor II
(Avoidance), seven items with primary loadings on Factor III (Cognition), and six items on
Factor IV (Arousal). Consistent with previous factor analytic evaluations of the PCL-5 (e.g.,
Blevins et al., 2015), and the described DSM-5 conceptualization (APA, 2013), no secondary
loadings were modeled and the factors were allowed to intercorrelate. The following three fit
indices were used to evaluate models: the Tucker-Lewis fit index (TLI), comparative fit index
(CFI), and root mean square error of approximation (RMSEA; Brown, 2015). The following
guidelines were used to evaluate model fit. For CFI and TLI, values should be near .95 (Hu &
Bentler, 1999). For the RMSEA index, values < .05 indicate excellent fit, .05 to .08 indicate
adequate fit (Browne & Cudeck 1993), and the upper limit of the 90% RMSEA confidence
interval (CI) should not exceed .10 (Kline, 2016).

A multiple-groups CFA framework (Brown, 2015) was used test measurement
invariance. Specifically, restrictive models were used to test for (a) configural invariance (equal
form) and (b) metric/scalar invariance (equal factor loadings, indicator thresholds) between the
worst event Criterion A group (n = 309) and the secondary Criterion A group (n = 140). To test
configural invariance, the adequacy of the PCL-5 factor structure was examined simultaneously
in the two groups. To test metric/scalar invariance, factor loadings and indicator thresholds were
constrained to equality. Because PCL-5 item responses result in ordered–categorical data,
metric/scalar invariance were simultaneously modeled (e.g., Brown, 2015; Ebesutani, McLeish,
Luberto, Young, & Maack, 2014; Olatunji, Ebesutani, & Abramowitz, 2017).
The chi-square difference test was used to compare models. However, chi-square difference tests may indicate a significant difference between models when differences are actually trivial in magnitude because the test is highly influenced by sample size (Cheung & Rensvold, 2002). Thus, we also used alternative tests for comparing models (Brown, 2015; Kline, 2016; i.e., examining RMSEA 90% CIs and change in CFI [ΔCFI]). Differences in model fit are considered nonsignificant if models have overlapping 90% RMSEA CIs, (Wang & Russell, 2005) and if ΔCFI values of less than or equal to .01 are observed (Cheung & Rensvold, 2002).

Results

Event Descriptives

Sample 1. None of the data points for the variables of interest were missing in either Sample. In Sample 1 (N = 579), 339 (58.5%) participants endorsed a worst event that met DSM-5 Criterion A, while the worst event endorsed by 178 participants (30.7%) did not meet Criterion A. Additionally, 37 participants (6.4%) indicated that none of the events on the LEC-5 were applicable to them and 25 participants (4.4%) had a pattern of responding that was inconsistent or indicated inattentive responding (e.g., endorsing an LEC-5 event and then writing “N/A” or writing something for the narrative that was completely unrelated to the originally endorsed event). As can be seen in Table 1, the five most commonly endorsed event types for the 339 participants whose worst event met DSM-5 Criterion A, included transportation accident (24.8%), sexual assault (13.6%), sudden violent death (13%), physical assault (10.9%), and natural disaster (10.6%). For the 178 participants whose worst event did not meet Criterion A, 77 (43.3%) identified an event that involved death due to natural causes (e.g., parent dying of cancer), 40 (22.5%) identified an event that involved a health or medical-related issue that did
not involve death (e.g., self or family member struggling with chronic illness), and 35 (19.6%) identified other events that may be considered stressful, but not traumatic (e.g., financial difficulties, job loss, dissolution of a romantic relationship). The small remaining proportion of worst events did not meet Criterion A in this group because they did not meet severity thresholds (e.g., exposure to actual or threatened death, serious injury, or sexual violence; APA, 2013). Some examples of these incidents include minor transportation accidents without threat of serious injury or death, or kitchen fires that were easily extinguished (e.g., a pan on the stove catches fire).

**Sample 2.** In Sample 2 ($N = 569$), 309 participants (54.3%) endorsed a worst event that met DSM-5 Criterion A, while the worst event endorsed by 201 participants (35.3%) did not meet Criterion A. Additionally, 45 participants (7.9%) indicated that none of the events on the LEC-5 were applicable to them and 14 participants (2.5%) had a pattern of responding that was inconsistent or indicated inattentive responding. Four of the five most commonly endorsed event types for the 309 participants whose worst event met DSM-5 Criterion A were consistent with those reported by participants in Sample 1 (i.e., sexual assault, transportation accident, sudden violent death, natural disaster; see Table 1). For the 201 participants whose worst event did not meet Criterion A, 67 (33.3%) identified an event that involved death due to natural causes, 55 (27.7%) identified a health or medical-related event that did not involve death, and 40 (19.9%) identified other events that may be considered stressful, but not traumatic. Consistent with Sample 1, the remaining proportion of worst events did not meet Criterion A in this group because they did not meet severity thresholds (APA, 2013).

As hypothesized, a substantial proportion of Sample 2 would have been misidentified as non-Criterion A through sole use of the worst-event method. Specifically, of the 201 participants
whose worst event did not meet Criterion A, 140 (69.7% [24.6% of the entire sample]) reported at least one other event that met DSM-5 Criterion A (henceforth referred to as the secondary Criterion A group). In this group, the five most commonly endorsed event types that met Criterion A were transportation accident (57.1%), sexual assault (31.4%), physical assault (30.7%), other serious accident (30.0%), and fire or explosion (29.3%; see Table 1).

**Confirmatory Factor Analysis: Testing Measurement Invariance**

As expected, the correlated four-factor model provided adequate fit to the data, $\chi^2 = 532.48$ (164, $p < .001$), CFI = .985, TLI = .983, RMSEA = .071 (90% CI = .064 - .077), in Sample 2 participants who reported at least one Criterion A event. All factor loadings were significant and large in magnitude ($\beta$s from .75 to .94, $p$s < .001). Additionally, all of the subscales clustered well with one another, with latent correlations among the four domain-specific factors ranging from .77 to .94.\(^1\)

As described, invariance testing was conducted to determine whether the factor structure of the correlated four-factor model of posttraumatic stress symptoms differed between the worst event Criterion A group and secondary Criterion A group from Sample 2. Both models (configural and scalar) exhibited adequate fit to the data, configural model: $\chi^2 = 675.63$ (328), $p < .001$, CFI = .987, TLI = .985, RMSEA = .069 (90% CI = .061 - .076); scalar model: $\chi^2 = 729.70$ (400), $p < .001$, CFI = .988, TLI = .988, RMSEA = .061 (90% CI = .054 - .068).

Although there was a significant $\Delta \chi^2$ (99.82 [72], $p = .02$), RMSEA 90% CIs were overlapping and there was no decrement in CFI between models, thus indicating that the more restrictive model did not evidence a significant degradation in fit compared to the less restrictive model.

**Posttraumatic Stress Symptom Severity**
Means and standard deviations of the PCL-5 Total score and subscale scores are presented in Table 1. Independent samples t-tests were conducted to examine between-groups differences in PCL-5 scores. In Sample 2, no significant differences were observed for the PCL-5 total score ($t[467] = .44, p = .66, \text{Cohen's } d = .04$), and four subscale scores ($ps > .19, \text{Cohen's } ds$ from .06 to .12), between the worst event Criterion A ($n = 309$) and secondary Criterion A groups ($n = 140$).

Discussion

The primary aim of the present study was to obtain an estimate of the proportion of a general population sample that is misidentified as non-Criterion A through use of the worst-event method. As expected, a substantial proportion of those that would have been identified as non-Criterion A through sole use of the worst-event method had experienced a Criterion A event. In fact, almost three quarters of the participants whose identified worst event did not meet Criterion A had a secondary Criterion A event and these individuals accounted for a quarter of the entire sample. In the research context, the worst-case scenario is that these individuals are placed in a non-trauma control group. This represents a significant threat to internal validity because the two groups (trauma and non-trauma) would not actually differ on the variable of interest (i.e., trauma exposure). In contrast to this approach, researchers commonly exclude participants from study inclusion, or at least from data analysis, based on the worst-event method. Excluding trauma-exposed individuals from the sample, because they have been misidentified, poses a threat to external validity. That is, one cannot make inferences that suggest that study findings generalize to trauma survivors when a specific subset of trauma survivors, which appear to constitute a fairly large group, has been removed from the sample. Additionally, the worst-event approach, in the absence of follow-up questions to all events that are endorsed on the LEC-5, has a number of
other disadvantages. For example, use of the worst-event method, versus the proposed alternate approach, requires that researchers recruit significantly more participants to obtain the desired sample size. To obtain the desired sample size using the worst-event method, one has to be prepared to either compensate approximately 25% of the original sample of participants whose data will be discarded due to misidentification or use a potentially costly multi-stage study design (i.e., screening with follow-ups for all events followed by primary study).

For participants in the secondary Criterion A trauma group, the primary reason that their worst event did not meet Criterion A was because the identified event involved death due to natural causes. This is consistent with research showing that nonviolent/nonaccidental death is frequently identified as the worst, or most bothersome event relative to other event types (Breslau et al., 1998; Gold, Marx, Soler-Baillo, & Sloan, 2005; Keyes et al., 2014). Previous research on nonviolent/nonaccidental death as the worst event has primarily focused on deaths that were “sudden” or “unexpected” because this was a requirement in DSM-IV for these events to meet Criterion A. However, in the present study, the large majority of the non-DSM-5 worst events in the realm of death due to natural causes ($n = 77$ in Sample 1 and $n = 67$ in Sample 2) were not sudden and/or unexpected. A large proportion of these were cancer- or other chronic-illness-related deaths. Without a written narrative or follow-up questions (i.e., LEC-5 standard), these events would not have been identified for failure to meet Criterion A. For example, this subset of participants commonly endorsed “severe human suffering” or sudden “violent” or “accidental” death on the LEC-5 and then provided a written narrative and answers to follow-up questions that clarified that the event in question was related to a family member or close friend’s prolonged chronic illness that steadily deteriorated, thus resulting in death. This highlights the importance of requiring participants to provide a written narrative of endorsed
Identification of a health or medical condition (22.5 to 27.7%) or other stressful life experience (19.6 to 19.9%; e.g., dissolution of relationship, financial difficulties) accounted for the majority of the remaining reasons why an identified worst event did not meet Criterion A. Consistent with research on death due to natural causes, it is not surprising that a significant proportion of the sample identified what are typically considered stressful life events as their worst event (Anders et al., 2012). It is noteworthy, however, that at least 1/3 of those in the secondary Criterion A group reported experiencing physical or sexual assault that met Criterion A, and over half reported a Criterion A-congruent transportation accident, but these events were considered less distressing than the noted stressful life events. Although empirical research suggests that significant levels of posttraumatic stress symptoms are reported in response to DSM-incongruent stressors, the literature is mixed regarding whether symptom severity is lower (Larsen & Pacella, 2016) or higher (Gold et al., 2005) for DSM-incongruent events relative to DSM-congruent events. Regardless of the debate surrounding DSM-incongruent stressors in the context of posttraumatic stress symptoms, study findings suggest that a substantial portion of those who have experienced a traumatic event are misidentified through use of the worst-event method.

Also of note, similar levels of Criterion A worst events were reported across samples (Sample 1 = 58.5%, Sample 2 = 54.3%). These numbers are consistent with studies that have used the worst-event method and the extended version of the LEC-5 (e.g., 59.3%: Fergus & Bardeen, 2017; 55.9%: Silverstein, Dieujuste, Kramer, Lee, & Weathers, 2018; 55.4%: Silverstein, Lee, Witte, & Weathers, 2017). As described, failure to require follow-up questions (i.e., LEC-5 standard), may result in large discrepancies between these approaches (e.g., 92.8%:
Aarstad-Martin & Boyraz, 2017; 93.7%: Bardeen & Fergus, 2016). This too highlights the importance of requiring participants to provide a written narrative of endorsed events.

Additionally, four of five of the most frequently endorsed worst-event types were the same across samples (i.e., transportation accident, sexual assault, sudden violent death, and natural disaster). These four most frequently endorsed worst events have been observed among the top five positions in similar studies (Blevins et al., 2015; Fergus & Bardeen, 2017). Consistency of event endorsement across the two samples in the present study, as well as across other studies, increases our confidence that study findings are generalizable.

An exploratory aim of the present study was to examine whether posttraumatic stress symptoms (i.e., severity and factor structure) in Sample 2 differed between those in the worst event Criterion A group and the secondary Criterion A group. Consistent with previous research (Armour, Müllerová, & Elhai, 2016; Blevins et al., 2015; Byllesby et al., 2017; Elhai & Palmieri, 2011), we found that the four-factor model (as per the DSM-5; APA, 2013) provided adequate fit to the data. Importantly, examination of measurement invariance suggests that the model’s factor structure fits equally well independent of whether the identified worst event met Criterion A or whether a secondary event met criterion A. This finding supports including those who have experienced a Criterion A event, regardless of whether the identified worst event meets Criterion A, in trauma samples when examining posttraumatic stress symptomatology via the PCL-5. This conclusion is further supported by the fact that posttraumatic symptom severity (i.e., total and clusters scores) did not differ between these two groups.

The present results should be considered in light of study limitations. Although research supports MTurk as a viable method for data collection (Chandler & Shapiro, 2016), and methods shown to increase data quality were used in the present study (e.g., using high reputation MTurk...
workers; Peer, Vosgerau, & Acquisti, 2014), MTurk samples do not necessarily represent the general population. As such, replicating study findings in samples with greater male representation, more racial/ethnic diversity, and higher levels of posttraumatic stress symptoms (i.e., clinical samples) will be important in the future to ensure that study findings generalize. Despite utilization of a non-clinical sample, it is important to note that a considerable proportion of the trauma-exposed sample reported the presence of clinically relevant posttraumatic stress symptoms (i.e., approximately 20% using the PCL-5 cut score of 37; Blevins et al., 2015). This proportion of clinically relevant posttraumatic stress symptoms is consistent with that which has been observed in similar samples of trauma-exposed adults recruited via the internet (e.g., [18.4%] Fergus & Bardeen, 2017).

Because the emphasis of this study was on the assessment of trauma as defined in the DSM-5, we tested the DSM-5 defined factor structure of our measure of posttraumatic stress (i.e., the correlated four-factor model; APA, 2013). However, a number of recent studies (e.g., Armour, Mullerova, & Elhai, 2016; Wortmann et al., 2016) have used CFA to test alternate models of the PCL-5 (Weathers, Litz et al., 2013), which tend to be more complex and better fitting than the model outlined in the DSM-5. Some have suggested caution in using these alternate models because more complex models often have better fit than simpler models (Brown, 2015) and the newly identified symptom clusters may have relatively little value in terms of understanding relations with relevant clinical phenomena (Silverstein et al., 2018). With that cautionary note in mind, it may be worth examining these alternate models in future research in individuals whose worst event does not meet Criterion A, but who have experienced a secondary Criterion A event (e.g., secondary Criterion A). Additionally, it will be important to replicate the present results from invariance testing in trauma-exposed samples with larger
secondary Criterion A subsamples, as some guidelines for determining sample size for use in
CFA suggest using samples \( \geq 200 \) or following the \( N/p \geq 10 \) ratio (Myers, Ahn, & Jin, 2011).

Assessment of trauma history via clinical interview is considered the gold standard (i.e.,
Clinician-Administered PTSD Scale [CAPS]; Weathers, Blake et al., 2013a). This assessment
method, in comparison to use of the worst-event method via self-report, reduces the likelihood
that individuals with a trauma history will be misidentified. However, when clinical interview is
not practical (e.g., financial or time considerations), the method used in the present study should
be considered (i.e., use of conditional branching so that follow-up questions and narratives are
required for all endorsed events). Another option would be to ask participants to rank order the
events endorsed on the screening page from worst to least bothersome. The participant could
then provide a narrative and complete follow-up questions in reference to the top three worst
events, thus reducing the participant burden imposed by the alternate approach used in the
present study.² Before implementation, this approach should be examined in future research to
determine concordance with the results of the approach used in the present study.
References


posttraumatic stress symptoms. *Journal of Psychopathology and Behavioral Assessment*, 38, 320-329


Footnotes

1See supplemental Figures 1 and 2 for depictions of the correlated four-factor model with standardized path coefficients presented separately for those in the worst event Criterion A group ($n = 309$) and those in the secondary Criterion A group ($n = 140$).

2We thank an anonymous reviewer for drawing our attention to this alternate approach to assessing trauma that warrants consideration in future research.
### ASSESSING TRAUMA HISTORY

Table 1. Event endorsement and posttraumatic stress symptoms.

<table>
<thead>
<tr>
<th>Event</th>
<th>Sample 1</th>
<th>Sample 2</th>
<th>Sample 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DSM-5 Criterion A Worst Event</td>
<td>Non DSM-5 Worst Event</td>
<td>DSM-5 Criterion A Worst Event</td>
</tr>
<tr>
<td></td>
<td>(n = 339: 58.5%)</td>
<td>(n = 178: 30.7%)</td>
<td>(i.e., Index Criterion A group; <em>n</em> = 309: 54.3%)</td>
</tr>
<tr>
<td>Transportation accident</td>
<td>84 (24.8%)</td>
<td>6 (3.4%)</td>
<td>55 (17.8%)</td>
</tr>
<tr>
<td>Sexual assault</td>
<td>46 (13.6%)</td>
<td></td>
<td>62 (20.1%)</td>
</tr>
<tr>
<td>Sudden violent death</td>
<td>44 (13%)</td>
<td></td>
<td>40 (12.9%)</td>
</tr>
<tr>
<td>Physical assault</td>
<td>37 (10.9%)</td>
<td></td>
<td>21 (6.8%)</td>
</tr>
<tr>
<td>Natural disaster</td>
<td>36 (10.6%)</td>
<td>15 (8.5%)</td>
<td>27 (8.7%)</td>
</tr>
<tr>
<td>Assault with weapon</td>
<td>22 (6.5%)</td>
<td></td>
<td>16 (5.2%)</td>
</tr>
<tr>
<td>Sudden accidental death</td>
<td>18 (5.3%)</td>
<td></td>
<td>13 (4.2%)</td>
</tr>
<tr>
<td>Other serious accident</td>
<td>12 (3.5%)</td>
<td></td>
<td>26 (8.4%)</td>
</tr>
<tr>
<td>Other sexual experience</td>
<td>11 (3.2%)</td>
<td></td>
<td>11 (3.6%)</td>
</tr>
<tr>
<td>Other stressful event</td>
<td>11 (3.2%)</td>
<td>35 (19.6%)</td>
<td>4 (1.3%)</td>
</tr>
<tr>
<td>Fire or explosion</td>
<td>10 (2.9%)</td>
<td>5 (2.8%)</td>
<td>21 (6.8%)</td>
</tr>
<tr>
<td>Combat</td>
<td>6 (1.8%)</td>
<td></td>
<td>4 (1.3%)</td>
</tr>
<tr>
<td>Life-threatening illness</td>
<td>1 (0.3%)</td>
<td></td>
<td>3 (1.0%)</td>
</tr>
<tr>
<td>Severe human suffering</td>
<td>1 (0.3%)</td>
<td></td>
<td>2 (0.6%)</td>
</tr>
<tr>
<td>Serious harm caused by participant to other</td>
<td>2 (0.6%)</td>
<td></td>
<td>3 (2.1%)</td>
</tr>
<tr>
<td>Exposure to toxic substance</td>
<td>1 (0.3%)</td>
<td></td>
<td>7 (5.0%)</td>
</tr>
<tr>
<td>Captivity</td>
<td>1 (0.3%)</td>
<td></td>
<td>2 (1.3%)</td>
</tr>
<tr>
<td>Death due to natural causes</td>
<td>77 (43.3%)</td>
<td></td>
<td>67 (33.3%)</td>
</tr>
<tr>
<td>Health or medical–related without death</td>
<td>40 (22.5%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PTSD Checklist-5 Scores</th>
<th>M (SD)</th>
<th>M (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCL-5 Total Score</td>
<td>19.46 (19.86)</td>
<td>18.64 (17.59)</td>
</tr>
<tr>
<td>PCL-5 Intrusion</td>
<td>5.01 (5.34)</td>
<td>4.71 (4.72)</td>
</tr>
<tr>
<td>PCL-5 Avoidance</td>
<td>2.69 (2.68)</td>
<td>2.89 (2.57)</td>
</tr>
<tr>
<td>PCL-5 Cognition</td>
<td>6.30 (7.41)</td>
<td>6.31 (7.13)</td>
</tr>
<tr>
<td>PCL-5 Arousal</td>
<td>5.47 (5.82)</td>
<td>4.74 (5.19)</td>
</tr>
<tr>
<td>Total Criterion A Trauma Types</td>
<td>3.12 (2.03)</td>
<td>2.94 (1.83)</td>
</tr>
</tbody>
</table>
Figure 1. CFA of the correlated four-factor model in Sample 2’s worst event Criterion A group ($n = 309$).

Note: all parameter estimates fully standardized (i.e., STDXY standardization) and significant at $p < .001$;

pelintrus = PCL-5 Intrusion cluster; pclavoid = PCL-5 Avoidance cluster; pclcog = PCL-5 Cognition cluster;
pclarous = PCL-5 Arousal cluster.
Figure 2. CFA of the correlated four-factor model in Sample 2’s secondary Criterion A group \((n = 140)\).

*Note:* all parameter estimates fully standardized (i.e., STDXY standardization) and significant at \(p < .001\);

鹈Intrus = PCL-5 Intrusion cluster; pAvoid = PCL-5 Avoidance cluster; pclCog = PCL-5 Cognition cluster;

鹈Arousal = PCL-5 Arousal cluster.