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A Confirmatory Factor Analysis of the PTSD Checklist 5 in Veteran and College Student Samples

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Abstract

An important change in the conceptualization of posttraumatic stress disorder (PTSD) has been the shift from a three-factor model used in the DSM-IV-TR to the current four-factor model used in DSM-5. Early research initially supported the three-factor model, but most recent data suggest a four-factor model provides the best fit. Still other research has examined evidence for a five-factor model that would include depression sequelae. By way of a confirmatory factor analysis, we demonstrate the reliability of DSM-5 PTSD criteria clustering in a sample of 124 OEF/OIF/OND Veterans treated at a VAMC (49% white, 89% men) and a sample of 737 college students (48% white, 78% women). All participants were trauma-exposed, and completed the PTSD Checklist for DSM-5. The current study shows both samples best support a five-factor model over two four factor models considered for the DSM-5, though none provided better than moderate fit. Implications of the current findings regarding the reliability of the new DSM-5 criteria of PTSD will be discussed.

1. Introduction

Posttraumatic stress disorder (PTSD) is a significant public health concern, particularly as veterans return home from overseas tours seeking treatment for trauma-induced injuries (Ivanova et al., 2011). In the general population, research suggests that 25% (Norris & Sloan, 2007) to 67% (Elhai, 2012) of Americans will experience a traumatic event (as defined by the DSM-IV-TR). The lifetime prevalence of PTSD in the United States is estimated to be between 3.5–7.8% (Kessler et al., 2005, 1995) in the general population, and as high as 13.8% among veterans (Tanielian, & Jaycox, 2008). Despite its prevalence, questions remain about how many dimensions best represent the latent structure of PTSD..

The PTSD model in the DSM-5 (American Psychiatric Association, 2013) is divided into four symptom-related criteria. PTSD symptoms include: intrusive symptoms such as recurrent involuntary memories, nightmares, and intense or prolonged stress in relation to

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reminders of the trauma (Criterion B); avoidance of thoughts, feelings, and external reminders of the trauma (Criterion C); negative alterations in cognitions and mood such as diminished interest in activities and feeling alienated from others (Criterion D); and alterations in arousal, reactivity, sleep disturbances and exaggerated startle response (Criterion E). (American Psychiatric Association, 2013).

The DSM-5 criteria for PTSD also reflect structural changes relative to the DSM-IV-TR. Originally categorized as an anxiety disorder, PTSD is now in a new category called the Trauma- and Stressor-related Disorders. Criterion A has also been changed, no longer requiring an individual to experience “fear, helplessness, or horror” to receive a PTSD diagnosis (American Psychiatric Association, 2000, 2013). DSM-5 includes three new symptoms addressing distorted sense of blame for self and others, persistent negative mood states, and engaging in reckless or destructive behaviors. One symptom was eliminated, and other symptoms have had minor clarifying revisions. Additionally, the symptoms are assigned to four symptom sets, as opposed to three. The ongoing structural research continues to inform DSM revision decisions.

At least 42 studies have been published examining the factor structure of PTSD in adults, and four models have developed strong support. However, few of these studies were conducted since the release of the DSM-5 with the new symptoms confirmed. Further, few of these studies examined the stability of these structural models across different subgroups of trauma exposed individuals, that is, examining measurement invariance, because model analyses often require larger samples and researchers often combine samples. However, Engdahl and colleagues (2011) examined both two four-factor models finding measurement noninvariance among veteran and nonveteran samples. To test for measurement invariance, they used a multigroup confirmatory factor analysis (MCFA) and found that the measure invariance was not established. This lends support to the plausibility of combining samples when researchers combine samples to evaluate model fit.

To date, two models have the most support: the modified King and colleagues (DSM-5) model (1998) and the Simms model (Simms et al., 2002). Each model was developed based on differing theoretical perspectives. For example, King and colleagues (1998) tested models based on competing theoretical perspectives finding the best fitting model was based on the theoretical framework of Litz (1992). Litz (1992) suggested emotional numbing was poorly conceptualized and likely its own entity with PTSD. The King model split the avoidance and numbing symptom set into two categories, otherwise leaving the previous DSM-IV-TR symptoms intact (King et al., 1998).

Simms and colleagues (2002) tested several models, including the King model and a previously untested model. The untested model was created because the original D factor symptoms (such as sleep disturbance) did not fit well with the other symptom factors. Simms and colleagues (2002) loosely defined these symptoms as “dysphoria,” made up of Numbing and Hyperarousal symptoms (Simms et al., 2002).

The Elhai model has also received significant attention, presenting an alternative to the four-factor model. The model was based on Watson's (2005) research suggesting that sleep

disturbance, irritability, and difficulty concentrating represent a general dysphoria more consistent with depression symptoms and not like fear-based hyperarousal symptoms.. It is similar to the DSM-5, though the Hyperarousal symptom set is split between Watson's (2005) general dysphoria symptoms and call Dysphoric Arousal (Elhai, et al., 2011). The remaining hyperarousal symptoms such as "being "superalert" or watchful or on guard being called Anxious Arousal. Watson's (2005) research is also the foundation of increasingly complex models that have received significant support, but present statistical challenges due to factors containing only two symptoms to represent the symptom sets (Armour, et al., 2015).

Here we briefly review the representative literature on these models: the modified King and colleagues (DSM-5) model (1998), and the five-factor Elhai model (Elhai et al., 2011). The review examines research using confirmatory factor analyses. Table 1 presents the previous DSM-IV model and DSM-IV-based symptoms for reference. It also contains the DSM-5 model and the alternative models with the new DSM-5 symptoms.

In the DSM-IV-TR, PTSD symptoms were presented as three symptom sets: Re-experiencing, Avoidance/Emotional Numbing, Hyperarousal (American Psychiatric Association, 2000). However, factor analytic studies suggested that there were a number of alternatives to the DSM-IV-TR model (Elhai, et al., 2011; Gentes et al., 2014; King et al., 1998; Simms et al., 2002). Models consisting of at least four factors seem to show superior fit to the three-factor model (King et al., 1998; Simms et al., 2002; Elhai et al., 2011).

Though much of the evidence suggests the Simms model provides a better fit in several studies, overall, results have been mixed (Yufik and Simms, 2010). McWilliams, Cox, and Asmundson (2005) conducted research on a non-institutionalized civilian sample using data from the National Comorbidity Survey (Kessler et al., 1995). Based on Diagnostic Interview Schedule's PTSD module (Breslau, Davis, Andreski, & Peterson, 1991) results, the data showed that the King model had the best fit based on the goodness of fit index (GFI), the comparative fit index (CFI), and the root mean square error of approximation (RMSEA). However, the model did not meet criteria for good fit until elements (such as concentration difficulties and irritability) of the King model were adapted to fit more closely to the Simms model's dysphoria factor. Baschnagel, O'Connor, Colder, and Hawk (2005) examined PTSD symptoms using the Posttraumatic Diagnostic Scale administered at one and three months after trauma exposure in undergraduate students following the September 11th World Trade Center attack. Ultimately the Simms model fit was better than the King model, but the fit strength of the Simms model was inconsistent at the one and three-month time points. Also, Zelazny and Simms (2015) conducted a follow up confirmatory factor analysis study based on a sample of mental health treatment seeking participants. They used the Mini-International Neuropsychiatric Interview 6 (Sheehan et al., 1998) that was modified to include the new symptoms of the DSM-5. They compared the fit across a number of other models including the King/DSM-5 and Elhai model and more complex 6 and 7 factor models. The study found that the four and five-factor models provided acceptable fit.

Despite mixed findings, the Simms model has support across multiple samples, including combat veterans (e.g., Williams, et al., 2011). A meta-analysis looking at different measures

and sample sizes across 40 PTSD studies using DSM-IV criteria found the Simms model provided superior fit to several proposed PTSD models including the King model (Yufik and Simms, 2010). Another study also using DSM-IV criteria compared the symptom structure between the Simms model and King model in deployed and non-deployed veterans. Though no significant difference in model fit was found in the non-deployed group, the Simms model provided a better model fit in the deployed veteran sample (Engdahl, et al., 2011).

The King model also has strong support. Results from another study with a sample of 15,593 active duty military personnel showed the King model provided the best fit for the data (Mansfield et al., 2011), lending strong support to the model. A modified version of the King model with the three new PTSD symptoms was ultimately selected for the DSM-5 despite model fit being superior for the Simms across a variety of samples (American Psychiatric Association 2013; Gentes et al. 2014; Yufik and Simms, 2010).

Elhai et al. (2011) hypothesized a 5-factor model emphasizing the symptoms strongly correlated with depression and anxiety symptoms may provide the best model fit for the conceptualization of PTSD. The Re-experiencing, Avoidance, and Numbing symptom sets are intact, but the Hyperarousal symptom set is divided into Dysphoric Arousal and Anxious Arousal. Results showed the high comorbidity between depression and anxiety were represented structurally in a factor analysis. The results of the analysis showed the Elhai model had similar fit scores to that of the Simms and King model. A subsequent study by Armour et al. (2012) found the Elhai model had a significantly superior fit than both the King and Simms model based on a confirmatory factor analysis of Gulf war veterans and primary care patients. A recent study by McSweeney and colleagues (2016) conducted an exploratory factor analysis using the PCL-5 also supported a five-factor model.

1.2 Present Study

In order to understand whether the new DSM-5 criteria show a better fit to data derived from diverse groups of individuals with PTSD, relative to other proposed models, more empirical studies are warranted. Based on existing research, there is still some question whether the DSM-5 PTSD symptom factors provide the best fit for the data. In this work, we investigated the current model reflected in DSM-5 and alternative models for the PTSD symptom sets. The DSM-5, Simms, and Elhai models were examined. Though new 6 and 7-factor PTSD models have been developed, we focus on models with fewer factors to limit instances of factors with fewer than two items to maintain stability within our samples. The work investigated the best-fitting models in two samples, one sample of individuals with mixed civilian trauma, and one sample of veterans to assess the universality of the different models across different groups. No previous research has examined both a civilian and veteran sample across the three different models to confirm best model fit.

Based on the current literature including the extensive meta-analysis conducted by Yufik and Simms (2010), we predicted the Simms model should provide the best fit for the data in both civilian and veteran samples. This means the model that combines most of the symptoms now comprising the Numbing and Hyperarousal into one symptom set called “dysphoria” will provide a better fit for the data over the modified King/DSM-5 model, which splits the numbing and avoidance symptom set. This finding would suggest that the dysphoria

construct plays a stronger role in the conceptualization of PTSD as theorized by Simms and Elhai. If the Elhai model provides a better fit, it also suggests a new direction in the conceptualization of PTSD related to dysphoria in the form of dysphoric arousal and anxious arousal. This assessment was based on RMSEA, TFI, GFI, and CFI values. Due to the emerging support for the five-factor Elhai model, it was examined to determine its strength relative to the four-factor models. Also, in the interest of replication of Engdahl and colleagues (2011) measurement invariance research, we combined our samples to examine whether we could achieve similar results.

2. Method

2.1 Participants

As represented in Table 2, the first sample included 129 Operation Iraqi Freedom/Operation Enduring Freedom/Operation New Dawn veterans recruited during primary care visits from the Veteran Affairs Medical Center in Memphis, TN as part of a larger study. Potential participants were approached at waiting areas in medical clinics throughout the main Veterans Affairs Medical Center building and at outlying clinics. The sample included 114 (88%) men and 15 (11%) women. Fifty-eight (45%) of the participants identified as white, 61 (47%) identified as African American, or at least one participant identified as Hispanic, Native American, or Asian, or multi-racial. Participant age ranged from 21 to 66 with a mean age of 35 years old (SD = 10.10). When filling out the PCL-5, the veteran participants were asked to recall their combat or exposure to a war-zone. The mean score for the PCL-5 was 48.70 (SD = 19.7) out of a possible score of 80. All participants had been deployed as part of OEF/OIF for an average of 9.9 (SD = 9.4) months. The veterans had been returned for an average of 3.63 (SD = 2.72) years.

Also represented in Table 2, the second sample included 737 college students at the University of Memphis who reported trauma exposure as defined by Criterion A in DSM-5. Potential participants who did not endorse an event that met Criterion A were not included in this investigation. Questions assessing life threat and exposure level (e.g. direct exposure, witnessing, and learning about the event) were used to screen these participants. The sample contained 165 (22%) men, and 570 (78%) women and 2 individuals who did not report their gender. Nearly half of the sample, 354 (48%) identified as white, 292 (40%) as African American or at least one participant identified as Hispanic, Native American, Asian, or multi-racial. Participants' ages ranged from 18 to 54 with a mean age of 20.7 (SD = 4.7). The mean score on the PCL-5 was 31.2 (SD = 14.01) out of a possible score of 80. Participants were asked to indicate which traumatic event they considered to be the "worst" event, and were asked to base their PCL-5 responses on this event. The most frequently identified "worst" traumatic event category was motor vehicle accident (MVA, 17.8%), followed by sexual assault (11.8%), and a sudden violent death of someone close to them (8.4%).

2.2 Procedure

Participants in the veterans sample were approached by research project staff at VAMC clinics and invited to participate. Interested veterans completed a brief packet of

questionnaires that included the PCL-5. These participants were invited to participate in a larger study that entailed attending two assessment sessions as well, but data used in the present analyses were derived from the initial packet. The Institutional Review Boards at both the Memphis VA Medical Center and The University of Memphis approved this study.

The civilian sample data were collected using the Psychology Research Participation System (Sona system) at the University of Memphis as part of a larger study. Participants completed a set of self-report measures online and were awarded one credit hour toward any psychology course requiring research credit.

2.3 Measures

Sociodemographic questionnaire. A sociodemographic questionnaire assessed general demographic information in both samples. It was modified to ask sample-specific information (e.g., questions about military experience for the veteran sample and about academic progress for college students).

Life Events Checklist (LEC). The LEC is a self-reported measure assessing exposure to 17 potentially traumatic events. Individuals were asked to indicate whether they had experienced the event directly, indirectly, or if they had learned about it happening to a close other (Blake et al., 1995).

PTSD Checklist for DSM-5 (PCL-5). The PCL-5 is a 21-item self-reported measure assessing PTSD symptoms based on DSM-5 criteria (Weathers et al., 2013). It is a revision of the previous PCL scale that corresponded to DSM-IV-TR symptoms. The PCL-5 describes symptoms such as “Repeated, disturbing dreams of the stressful experience” and “Feeling very upset when something reminded you of a stressful experience,” with anchors ranging from 0 (not at all) to 4 (extremely). The PCL-M, PCL-C, and PCL-S based on the DSM-IV-TR has been shown to have a high convergent validity with the Clinician Administered PTSD Scale (CAPS), considered to be the “gold standard” for PTSD diagnosis and assessment (Wilkins, 2011). The scores range from 0 to 80, with a score of 38 or greater indicating likely PTSD (Blevins et al., 2015) in college students and a score between 31–33 in veterans (Bovin, 2015). Blevins and colleagues also demonstrated the PCL-5 exhibited strong internal consistency ($\alpha = 0.94$), test-retest reliability ($r = 0.82$), and convergent (r’s = 0.74 to 0.85) and discriminant (r’s = 0.31 to 0.60) validity in college students. In veterans, Bovin and colleagues (2015) found PCL-5 test scores demonstrated strong internal consistency ($\alpha = 0.96$), test-retest reliability ($r = 0.84$), and convergent and discriminant validity. In the present study, the PCL-5 demonstrated high internal consistency ($\alpha = 0.96$ for the veteran sample and 0.97 for the civilian sample).

2.4 Data Analysis Plan

IBM AMOS 23 was used to conduct the model analyses (Arbuckle, 2014). Prior to conducting our analyses, data were examined for missing values. Due to completing less 50% of the PCL items, ten participants in the Veteran sample were removed from the original 139 participants leaving 129 for analysis. No student participants that met Criterion A required removal. In the veteran sample, missing data for each variable ranged from 4–6% and in the student sample. Missing data were 0.01% across all variables. Missing data were

replaced using Full Information Maximum Likelihood (FIML). The next step was to conduct confirmatory factory analysis using Maximum Likelihood estimation based on modified King model/DSM-5, Simms, and Elhai models for goodness of fit with the two samples. First the sample model fit was assessed separately and then the data were combined and we examined the model fit in the combined sample. A confirmatory factor analysis has been shown to be an effective method of testing model fit (Marsh et al., 1988). For the current study, RMSEA, TFI, GFI, CFI, and AIC were used as fit indices. The RMSEA is measured on a scale from one to one with a score closer to zero being ideal. A good fit falls below 0.08, with 0.08–.10 being considered mediocre, and above 0.10 considered poor fit (MacCullum et al., 1996). The TFI, GFI, and CFI are measured on a scale from zero to one with scores closer to one being ideal. For TFI, 0.90 and greater are generally considered to be a good fit, however researchers have argued for a more restrictive value of 0.95 (Hu and Bentler, 1999). For GFI, 0.90 is generally considered an acceptable cutoff for good fit, however due to its sensitivity to sample size, it is recommended to use a .95 cutoff for smaller sample sizes (Miles and Shevlin, 1998). CFI has a recommended cutoff of 0.90, though some researchers have argued for 0.95 to ensure poor models are not accepted (Hu and Bentler, 1999). Models with lower AIC values are considered an improvement over models with higher AIC. We also examined whether we were measuring the same construct of PTSD across both samples using measurement invariance. Data were analyzed at the item level.

3. Results

Results from the confirmatory factor analysis suggested the Elhai model had marginally superior fit statistics over both the Simms and DSM-5 models in both the college student sample and the veteran sample with the exception of the AIC value (Simms=411.10, 706.57; Elhai 577.56, 1132.11). As represented in Table 3, we used the following cut-off scores to identify good fit: A non-significant Chi-Square test, GFI, CFI, and TFI scores equal to or greater than 0.90, and RMSEA scores of 0.08 or less. AIC was used to compare model parsimony. Across the three models, none provided better than moderate fit in either sample.

We investigated measurement invariance across the two samples, and found the factor loadings did not meet criteria for measurement invariance using both configural and metric tests across all three models (Vandenberg and Lance, 2000). The AIC statistics were also worse across the three models The King model AIC for the combined sample was 1847.93 compared to 607.75 for veterans and 1238.62 for college students alone. The Simms model AIC for the combined sample was 1900.00 and 411.10 for the veteran sample and 706.57 for the college student sample. The Elhai model AIC was 1711.128 for the combined sample, and 577.56 for veterans, and 1132.11 for college students. Table 4 displays the standardized factor loadings across each item.

Between the two samples evaluated in the current study, the college student sample showed better overall fit, even across the TFI and CFI fit indices that are more resistant to smaller sample size type I or type II errors. The veteran sample also had poor fit across all models, particularly for RMSEA values despite low Chi-Square values (DSM-5, 0.12; Simms, 0.11; Elhai, 0.12). Though both the RMSEA and Chi-Square values are affected by sample size,

the acceptable range Chi-square versus degrees of freedom ratios falls between two (Tabachnick and Fidell, 2007) to five (Wheaton et al, 1977). All Chi-Square tests were significant at $p < .001$.

4. Discussion

The current research adds to the body of evidence supporting the similar, but better overall fit of the Simms over the DSM-5 model across both samples as represented in Table 3. However, our research shows only poor to moderate support across the fit indices. The Elhai model, with five factors rather than the four of the DSM-5 and Simms model, provided better fit, though it still only provides moderate fit across both samples. This lends support to the conceptual validity of the "dysphoria" construct within PTSD. Despite the DSM-5 modifications changing the diagnosis of PTSD from three factors in DSM-IV to four factors, it still may not address the complexity of PTSD and the construct of dysphoria.

Also, consistent with Engdahl et al. (2011), the current research did not show evidence of measurement invariance between college students and veterans. The initial configural invariance test did not yield similar fit (fit was poorer) indices compared to those in the individual samples across all models. A follow up metric test examining Chi-square test results between the unconstrained and constrained models was used to determine whether the latent variables were similar across the samples. Measurement invariance was also not found with the metric test approach. This may be something to consider when combining datasets to satisfy the relatively large sample size requirements for CFA.

One of the limitations of this study is the relative lack of gender diversity within the samples. In the college student sample, the majority of participants were women while the veteran sample was almost exclusively men. There was also a substantial age difference between the two samples with the veteran sample having a mean age of 35 years old (SD = 9.9) and the college students having a mean age of 20.7 (SD = 4.7). Additionally, the veterans were asked to relate their PCL-5 responses to wartime experiences, whereas the college students picked their worst lifetime event where they endorsed motor vehicle accidents, sexual assaults, and witnessing a homicide most frequently. Also, the lower overall PCL-5 scores (indicating level of severity of PTSD symptoms) in college students may have led to restriction of range when comparing model fit with the veteran sample. We may have also encountered ceiling effects based on higher veterans PCL-5 scores. Thus, several important differences between these samples, in addition to their roles as college student or veterans. Also, we used the PCL-5, a self-report measure, and not an interview measure like the Clinician Administered PTSD Scale, which is considered to be the gold standard for PTSD diagnosis (Weathers, et al. 2013).

Another limitation is the size of the samples. The college student sample was larger than the veteran sample, which may have had some effect on the RMSEA and Chi-square tests, which are sensitive to sample size. Whenever possible, we used fit indices that were less sensitive to sample size to mitigate this concern. Though the research is mixed on the sample sizes required for CFA, Wolf and colleagues (2013) suggest that higher factor loadings, such as those above 0.8, stabilize the analyses. The size of the veteran sample is within the margin

of acceptability according to MacCallum and colleagues (1999). Also, due to the statistical software used, we were unable to conduct analyses that test model fit and relied on visual inspections of the data.

This research supports the strength of the current model of PTSD as conceptualized in Simms model over the DSM model. However, the fit statistics for the Simms model suggest it still leaves room for improvement, particularly as it relates to dysphoria. More complex models are being developed that address continue to examine the role of dysphoria and the structure of PTSD. However, it is important researchers continue examining models and symptom reduction methodologies to find a balance between addressing the complexity of PTSD while maintaining a practical, parsimonious diagnosis. Bovin and colleagues (2015) performed the PCL-5 psychometric tests across several models for PTSD, including more complex six and seven models, also suggesting the current DSM-5 may still need to be reconfigured. However, with each additional factor, diagnosis becomes more complicated, with unknown consequences. More complicated factor structures could lead to an increasingly heterogeneous profile for PTSD. It may make creating stable criteria for diagnosis possible.

It is also important that the diagnostic PTSD model captures different traumas across multiple groups. Our research shows that consistent with other findings (Engdahl, et al, 2011), there is still some question whether the symptoms of different samples are represented in the models of PTSD with the most empirical and consensus-based support. This is especially critical as veterans return from conflicts seeking mental health services and college students potentially receive PTSD diagnoses more frequently under the DSM-5 criteria (Elhai, et al., 2012). Our research suggests that not only is there potential to improve the overall diagnosis of PTSD, it may also make sense to explore the utility in a uniform PTSD structure across samples.

The implications for finding only marginally fitting models for PTSD and the acceptance of increasingly complex structures suggest examining different approaches to understanding and diagnosing PTSD. Network analysis is one such approach where researchers examine PTSD through individual symptom influences and central symptom relationships (McNally et al., 2015).

As the structural nature of PTSD becomes clearer and diagnostic measures improve, clinicians and researchers will be able to address the growing need of trauma survivors, particularly as dysphoria remains complex due to its role in several disorders. Refining the methodologies in place and incorporating innovative approaches will bring researchers closer to untangling key aspects of PTSD so that researchers can enhance mental health services. The role of CFAs will continue to shed new light of the question of PTSD’s structure.

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Highlights

The Simms PTSD model provides the best fit.

In the present sample, none of the fit statistics for any model were better than moderate.

We did not find evidence of measurement invariance between the college student and veteran samples.

Table 1

PTSD Symptoms by Model

DSM Symptoms	DSM-IV	DSM-5	Simms	Elhai
1. Repeated, disturbing, and unwanted memories?	R	R	R	R
2. Repeated, disturbing dreams?	R	R	R	R
3. Suddenly feeling or acting as if the stressful experience were happening?	R	R	R	R
4. Feeling very upset when something reminds you of the stressful experience?	R	R	R	R
5. Having strong physical reactions to experience?	R	R	R	R
6. Avoiding memories, thoughts or feelings	A/N	A	A	A
7. Avoiding external reminder of the stressful experience?	A/N	A	A	A
8. Trouble remembering important parts of the stressful experience?	A/N	NACM	D	NACM
9. Having strong negative beliefs about yourself, others, or the world?	A/N	NACM	D	NACM
10. Blaming yourself or someone else for the stressful experience or what happened after it?	-	NACM	D	NACM
11. Having strong negative feelings such as fear, horror, anger, guilt, or shame?	-	NACM	D	NACM
12. Loss of interest in activities that you used to enjoy?	A/N	NACM	D	NACM
13. Feeling distant or cut off from other people?	A/N	NACM	D	NACM
14. Trouble experiencing positive feelings?	A/N	NACM	D	NACM
15. Irritable behavior, angry outburst, or acting aggressively?	H	AR	D	DA
16. Taking too many risks or doing things that could cause you harm?	-	AR	AR	DA
17. Being “superalert” or watchful or on guard?	H	AR	AR	AA
18. Feeling jumpy or easily startled?	H	AR	AR	AA
19. Having difficulty concentrating?	H	AR	D	DA
20. Trouble falling or staying asleep?	H	AR	D	DA

Note. R = re-experiencing, A/N = avoidance and numbing, NACM = negative alterations in cognitions and mood, H = arousal and reactivity, D = dysphoria, DA = dysphoric arousal, AA = anxious arousal.

Table 2

Veteran and College Student Sample Demographics

	Veterans	College students
Age (years)	35.0	20.7
SD	9.9	4.7
Gender		
Men	110 (89%)	165 (22%)
Women	14 (11%)	570 (78%)
Race		
White	61 (49%)	354 (48%)
Black	60 (48%)	292 (40%)
Other	10 (8%)	60 (8%)

Note. Some percentage do not equal 100% due to identifying in multiple categories.

Table 3

Model Fit Indices

	Veteran						College					
	X^2	df	AIC	CFI	TFI	RMSEA (90% CI)	X^2	df	AIC	CFI	TFI	RMSEA (90% CI)
DSM5	475.76	164	607.75	0.88	0.85	0.12(0.11–0.14)	1106.62	164	1238.62	0.91*	0.89	0.09(0.08–0.09)
Simms	463.47	164	411.10	0.92*	0.89	0.11(0.10–0.13)	1160.10	164	706.57	0.95*	0.93	0.08(0.07–0.08)
Elhai	434.06	160	577.56	0.89	0.86	0.12(0.10–0.13)	992.11	160	1132.11	0.92*	0.90	0.08(0.08–0.09)

Note. X^2 = chi square test; df = degrees of freedom; CFI = Comparative Fit Index; TLI = Tucker Lewis Index; RMSEA = Root Mean Square Error of Approximation.

* = >0.90 for CFI and TFI.

Table 4

Veteran and College Student Sample Factor Loadings Across Models

	DSM-5 Veterans	DSM 5 College	Simms Veterans	Simms College	Elhai Veterans	Elhai College
Item 1	0.908[a]	0.858[a]	0.909[a]	0.858[a]	0.908[a]	0.858[a]
Item 2	0.843[a]	0.751[a]	0.842[a]	0.751[a]	0.838[a]	0.751[a]
Item 3	0.870[a]	0.751[a]	0.870[a]	0.752[a]	0.870[a]	0.752[a]
Item 4	0.916[a]	0.819[a]	0.916[a]	0.818[a]	0.918[a]	0.818[a]
Item 5	0.843[a]	0.779[a]	0.843[a]	0.780[a]	0.844[a]	0.779[a]
Item 6	0.918[b]	0.909[b]	0.921[b]	0.909[b]	0.920[b]	0.909[b]
Item 7	0.945[b]	0.898[b]	0.942[b]	0.897[b]	0.943[b]	0.897[b]
Item 8	0.662[c]	0.485[c]	0.662[e]	0.483[e]	0.666[c]	0.485[c]
Item 9	0.809[c]	0.802[c]	0.804[e]	0.790[e]	0.812[c]	0.805[c]
Item 10	0.766[c]	0.769[c]	0.745[e]	0.751[e]	0.753[c]	0.763[c]
Item 11	0.871[c]	0.820[c]	0.866[e]	0.810[e]	0.868[c]	0.817[c]
Item 12	0.849[c]	0.768[c]	0.851[e]	0.763[e]	0.847[c]	0.769[c]
Item 13	0.899[c]	0.830[c]	0.898[e]	0.830[e]	0.897[c]	0.833[c]
Item 14	0.881[c]	0.847[c]	0.886[e]	0.839[e]	0.887[c]	0.848[c]
Item 15	0.822[d]	0.836[d]	0.824[e]	0.814[e]	0.825[f]	0.843[f]
Item 16	0.679[d]	0.614[d]	0.647[d]	0.612[d]	0.675[f]	0.614[f]
Item 17	0.868[d]	0.625[d]	0.903[d]	0.717[d]	0.909[g]	0.732[g]
Item 18	0.888[d]	0.748[d]	0.925[d]	0.834[d]	0.932[g]	0.887[g]
Item 19	0.796[d]	0.828[d]	0.803[e]	0.798[e]	0.796[f]	0.831[f]
Item 20	0.726[d]	0.695[d]	0.701[e]	0.654[e]	0.703[f]	0.696[f]

Note. Reference Table 1 for item number descriptions.

[a] = re-experiencing,

[b] = avoidance and numbing,

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[c] = negative alterations in cognitions and mood,

[d] = arousal and reactivity,

[e] = dysphoria,

[f] = dysphoric arousal,

[g] = anxious arousal.

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