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Reliability and validity of the Trauma Symptom Inventory with veterans evaluated for posttraumatic stress disorder

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ABSTRACT

The Trauma Symptom Inventory (TSI) is one of the most widely used instruments in the assessment of PTSD related symptoms [Elhai, J.D., Gray, M.J., Kashdan, T.B., Franklin, L.C., 2005a. Which instruments are most commonly used to assess traumatic event exposure and posttraumatic effects? A survey of traumatic stress professionals. Journal of Traumatic Stress 18, 541–545]. In spite of the fact that the TSI has demonstrated adequate psychometric qualities in past studies [Briere, J., 1995. Trauma Symptom Inventory professional manual. Psychological Assessment Resources, Psychological Assessment Resources; Briere, J., Elliott, D.M., Harris, K., Cotman, A., 1995. Trauma Symptom Inventory: Psychometrics and association with childhood and adult victimization in clinical samples. Journal of Interpersonal Violence 10, 387–401; McDevitt-Murphy, M. E., Weathers, F.W., Adkins, J.W., 2005. The use of the trauma symptom inventory in the assessment of PTSD symptoms. Journal of Traumatic Stress 18, 63–67] the measure's psychometrics have only as of yet been examined among civilians. We examined the TSI's psychometric properties using archival data from 221 treatment-seeking veterans evaluated for military-related posttraumatic stress disorder (PTSD) symptoms. Results demonstrated adequate internal consistency for the TSI's clinical scales (alphas ranging from 0.73 to 0.91). Convergent validity was established for clinical scales tapping PTSD's re-experiencing, avoidance and hyperarousal symptoms, and depression and irritability, against other similar measures. Structural validity was also supported in confirmatory factor analyses, with a three-factor model, and a similar model merging two of these three factors, best fitting the observed data.

1. Introduction

The Trauma Symptom Inventory (Briere, 1995) is one of the most widely used instruments in the assessment of posttraumatic stress disorder's (PTSD) symptoms (Elhai et al., 2005a). It evolved from the revision and expansion of the Trauma Symptom Checklist (TSC-33/40) (Briere and Runtz, 1989). The TSI is a 100-item self-report measure, tapping symptoms of PTSD and acute stress disorder (ASD), and other common trauma-related emotional problems. The TSI is not a stressor-specific instrument. Respondents are asked to rate items on a four-point Likert Scale, with "0" representing no experience of the symptom and "3" representing frequent occurrence in the last six months. Despite research supporting the TSI's psychometrics in civilian settings, however, previous research has not examined this issue among military veterans, an at-risk population for trauma exposure and traumatic stress.

Five of the TSI's clinical scales measure *DSM-IV-TR* PTSD criteria and five clinical scales measure other common trauma-related mental health symptoms. The 10 TSI clinical scales are the following, with the first five scales created to match *DSM-IV-TR* criteria: Anxious Arousal (AA), Depression (D), Anger/Irritability (AI), Intrusive Experiences (IE), Defensive Avoidance (DA), Dissociation (DIS), Sexual Concerns (SC), Dysfunctional Sexual Behavior (DSB), Impaired Self-Reference (ISR), and Tension-Reduction Behavior (TRB). The three validity scales that are designed to detect conflicting, underreporting and overreporting response sets, respectively, are the Inconsistent Response (INC), Response Level (RL), and Atypical Response (ATR) scales (Briere, 1995).

Anxious Arousal (AA), Depression (D), and Anger/Irritability (AI) scales tap into different types of disruption in mood. Intrusive Experiences (IE), Defensive Avoidance (DA), and Dissociation (DIS) scales are designed to measure the re-experiencing and avoidance symptoms of PTSD. Sexual Concerns and Dysfunctional Sexual Behavior scales measure attitudes and feelings regarding sex as well as sexual problems, respectively. Impaired Self-Reference (ISR) and Tension Reduction Behavior (TRB) scales tap into difficulties with self and affect regulation including outward behavior manifestations used to manage negative affect such as self-mutilation (Briere, 1995).

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Among civilian samples, the TSI's 10 clinical scales have demonstrated adequate internal consistency, with alpha coefficients ranging from 0.84 to 0.87 across studies (Briere, 1995). The TSI has also demonstrated reasonable convergent validity and, excluding the INC validity scale, all 12 other scales significantly correlated with other self-report PTSD measures, including the Impact of Event Scale-Revised, PTSD checklist, Civilian Mississippi PTSD Scale, and Traumatic Stress subscale of the Personality Assessment Inventory (PAI) (McDevitt-Murphy et al., 2005).

Adequate criterion validity has also been demonstrated, as higher scores on all TSI scales were associated with those reporting child and adult interpersonal trauma histories in comparison to their non-trauma-exposed counterparts (Briere, 1995). In another study, those participants reporting a history of childhood sexual abuse had significant elevations on six clinical scales and those reporting a history of child physical maltreatment had significant elevations on all 10 clinical scales in comparison to those without such trauma history (Runtz and Roche, 1999).

The TSI's ability to detect PTSD based on a joint scoring of the Impact of Event Scale and Symptom Checklist-90 (SCL-90) yielded sensitivity of between 92–96% in detecting PTSD and specificity of 91% (Briere et al., 1995). Another study using a structured diagnostic PTSD interview found that, in logistic regression analysis, TSI scales possessed 86% diagnostic utility in detecting PTSD (McDevitt-Murphy et al., 2005). Using a normative sample, the TSI has reasonable incremental validity in its ability to predict victimization history of women, as it accounts for variance beyond that demonstrated by other measures including the Impact of Event Scale (IES; 12% unique variance added), SCL-90 (8% unique variance), and the Brief Symptom Inventory (BSI) (17% unique variance). For men, the TSI's additional variance beyond that accounted for by other measures was only seen at a significant level relative to the BSI (7%) (Briere, 1995).

With regard to the TSI's structural validity, Briere's (1995) study revealed that both his two- and three-factor models adequately represented the intercorrelations among the TSI's clinical scales. The two-factor model's factors (derived from exploratory factor analysis) were labeled "Generalized Trauma and Distress" and "Self-Dysfunction," with scales AA, D, AI, IE, DA, DIS, ISR and TRB loading on the former factor, and scales DIS, ISR, TRB, SC, and DSB loading onto the latter factor. Briere's (1995) three-factor model (derived based on a more theoretically-driven confirmatory factor analysis) possessed factors labeled "Trauma," "Self," and "Dysphoria," with scales IE, DA, DIS, and ISR loading onto Trauma, scales ISR, SC, DSB, TRB, and AI loading onto Self, and scales AI, D, and AA loading onto Dysphoria. No additional published research has examined the TSI's factor structure.

The purpose of the current study was to extend analysis of the TSI's reliability and validity from civilian samples to examine military veterans evaluated for PTSD. Based upon previous psychometric research on the TSI (Briere et al., 1995; McDevitt-Murphy et al., 2005), and support for overwhelming similarities in clinical profiles across military and civilian PTSD samples (Elhai et al., 2000; Naifeh et al., 2008), we predicted that: 1) The TSI's clinical scales would yield similarly adequate internal consistency results that were achieved in Briere's (1995) study; 2) Scores on related PAI scales and the Beck Depression Inventory (BDI), Beck Anxiety Inventory (BAI), and Mississippi Combat PTSD Scale (M-PTSD) would converge with TSI scale scores; and 3) the TSI would yield similar structural validity results to that of Briere's (1995) study, with the two- and three-factor models both serving as adequate representations of the TSI's latent dimensions.

2. Method

2.1. Participants

For the purpose of this study, archival data from a VA Medical Center located in the Midwestern U.S. were used. Participants included 221 military veterans (203 men and 18 women), evaluated for and uninterruptedly enrolled (from 2000 to 2003) in outpatient treatment for military-related posttraumatic stress. Patients presented to the VA's PTSD clinic for evaluation after referral from a VA healthcare provider; typically, primary care providers generated the referrals after the veterans screened positive for PTSD in primary care. Interviews and self-report measures were initially utilized to obtain intake psychiatric diagnoses. Through utilization of an interviewer-administered PTSD symptom checklist (Foa et al., 1999), 91.7% ($n=198$) of participants met full PTSD diagnostic criteria. An additional 6.5% ($n=14$) met criteria for subthreshold PTSD; that is, the veteran endorsed many of the symptoms of PTSD but not the necessary number of symptoms to qualify for the diagnosis.

Participants' mean age was 52.07 years (S.D. = 10.59). Caucasians constituted the majority of the sample, with 16.3% ($n=36$) racial minorities. Slightly more than half (55.2%, $n=122$) were married, and 31.2% ($n=69$) were divorced. Education level averaged 12.98 years (S.D. = 1.95) and unemployment was high, as only 16.1% ($n=26$) of participants were employed.

The breakdown of the sample in regard to era of service is as follows: 71.9% Vietnam War ($n=159$), 6.3% World War II ($n=14$), 11.8% Korean War ($n=9$), 13.1% Gulf War ($n=29$), and 1.4% ($n=3$) Operation Iraqi and Enduring Freedom (OIF/OEF) veterans. Serving in a war zone was endorsed by 88.9% ($n=193$), and 82.9% ($n=179$) of participants reporting receiving friendly or hostile incoming fire. Albeit not based on a standardized interview, 11.3% ($n=25$) endorsed experiencing non-combat trauma (e.g. sexual/physical assault). Based on non-standardized interviews, 79.3% ($n=172$) screened positive for a mood disorder and 55.3% ($n=120$) for a substance-related disorder. The mean psychiatric disability rating percentage for the sample was 56.14% ($SD=29.18$), with one-third ($n=72$, or 33.6%) receiving VA disability payments for PTSD (evaluated on a scale of 0–100%, with higher percentages indicating more disability benefits to which the person is entitled).

2.2. Measures

The Mississippi Combat PTSD Scale (M-PTSD) is a 35-item, Likert-scaled self-report measure designed to assess combat-related PTSD symptoms. Using the empirically-supported diagnostic cutoff score of 107, the M-PTSD has demonstrated excellent sensitivity (0.93), specificity (0.89), and an overall PTSD diagnostic hit rate of 0.90. Adequate internal consistency (alpha of 0.94) and test–retest reliability ($r=0.97$) have also been demonstrated in veteran samples (Keane et al., 1988), with psychometric support more recently reported in additional veteran samples (Cook et al., 2005).

The Beck Depression Inventory (BDI) is a widely used 21-item self-report measure designed to assess depressive symptoms. It has adequate reliability and validity, with internal consistency of 0.86 (alpha), and concurrent validity against a major depressive disorder diagnosis ranging from 0.55 to 0.96 (Beck et al., 1988b). This measure has demonstrated strong internal consistency (.92) and validity in a veteran sample (Taft et al., 2007).

The Personality Assessment Inventory (PAI) is a 344-item, Likert-scaled self-report tool intended for the clinical personality assessment of adults. It consists of 11 clinical scales, four validity scales, five treatment scales, and two interpersonal scales. The PAI has adequate internal consistency (alpha) ranging from 0.81 to 0.86, and test–retest reliability *r*s ranging from 0.74 to 0.79. Adequate convergent and divergent validity have been demonstrated with more than fifty other psychopathology measures (Morey, 1991). Support has been found for the utilization of the PAI in the assessment of combat-related PTSD (Mozley, 2002, 2005).

The Beck Anxiety Inventory (BAI) is a widely used 21-item self-report measure designed to assess anxiety symptoms. Adequate internal consistency (alpha of 0.92) has been reported, as well as test–retest reliability ($r=0.75$) (Beck et al., 1988a), and concurrent validity ranging from 0.41 to 0.61 across studies (Beck and Steer, 1993). This measure has demonstrated strong internal consistency (.94) and validity in a veteran sample (Taft et al., 2007).

The Trauma Symptom Inventory (TSI) is a 100-item self-report measure, tapping symptoms of PTSD and ASD, and other common trauma-related emotional problems. Among civilian samples, adequate internal consistency has been reported, as well as construct validity (Briere, 1995) and concurrent validity in establishing PTSD diagnoses (Briere et al., 1995; McDevitt-Murphy et al., 2005). Furthermore, reasonable convergent (McDevitt-Murphy et al., 2005), predictive, and incremental validity (Briere, 1995) have been revealed for the TSI.

2.3. Procedure

The archival data were originally acquired through intake evaluations conducted by the VA's multidisciplinary outpatient PTSD clinical team (consisting of psychiatrists, clinical psychologists, and social workers). In addition to administration of the TSI and other measures described above to all participants (but the M-PTSD was given only to combat-exposed participants), a semi-structured interview addressed psychosocial, military and trauma history. Questions adapted from the War Stress Interview (Fontana et al., 1990) and Kadushin and colleagues' Combat Scale (Kadushin et al., 1981) were used to assess all military related traumatic events, as used in all VA PTSD clinics via the National Center for PTSD's PTSD Status Form. A diagnosis of PTSD was assessed using multiple measures including an interviewer-administered PTSD symptom checklist adapted from *DSM-IV* PTSD symptom criteria (Foa et al., 1999). This checklist has not been investigated for its psychometric properties, but is extremely similar to other *DSM-IV* PTSD symptom checklists in wording.

2.4. Statistical analyses

Eight participants were excluded from analyses for having no TSI data, leaving 214 participants. Internal consistency of the TSI's 10 clinical scales was conducted using Cronbach's alpha coefficient. Use of archival data did not permit test–retest reliability. Because of different treatment provider preferences and program changes in clinic test administration over time, varying numbers of participants completed the M-PTSD ($n=150$), PAI ($n=101$), BDI ($n=99$), and BAI ($n=97$). Thus, convergent validity analyses were conducted using varying sample sizes. Small amounts of missing item-level data (less than 10% of items for a given measure) were estimated using maximum likelihood procedures (Schafer and Graham, 2002). TSI items appeared to be completed consistently (INC T scores <80), and without an underreporting response bias (RL T scores <65). Overreporting on the TSI is difficult to assess, as the ATR scale has demonstrated substantial problems in identifying simulated PTSD (Elhai et al., 2005b).

Confirmatory factor analysis (CFA) in this study was computed for Briere's (1995) intercorrelated two- and three-factor models, testing both models separately with 1) variables loading on multiple factors (i.e., multidimensional assessment) as specified in Briere (1995), and 2) variables loading on only one factor each. For the latter, the factor on which a variable loaded higher in Briere's (1995) manual was specified in these analyses. CFAs were conducted using maximum likelihood estimation with Mplus 4.2 statistical software (Muthén and Muthén, 1998–2006, 2006). Because of significant multivariate non-normality (skewness and kurtosis), model fit was first determined with the Satorra–Bentler scaled chi-square test (Satorra and Bentler, 2001; Muthén and Muthén, 2007). To further assess model fit, the comparative fit index (CFI) and standardized root mean square residual (SRMR) were examined, both representing empirically supported fit indices that are appropriate when sample sizes are smaller than 250 (Hu and Bentler, 1998, 1999) (with an acceptable fit often associated with CFI>0.90 and SRMR<0.10, and excellent fit associated with CFI>0.95 and SRMR<0.08) (Hu and Bentler, 1999).

3. Results

3.1. Internal consistency

As shown in Table 1, the TSI's internal consistency was acceptable. The average Cronbach alpha was 0.83 across the ten clinical scales.

3.2. Convergent validity

As the relationship between TSI and PAI clinical scales have not been previously examined other than with the PAI's ARD-T scale (McDevitt-Murphy et al., 2005), we only compared TSI scales relevant to the available comparison scales. As shown in Table 2, all compared scales were significantly correlated with their similar counterparts at an alpha <0.01 level (two-tailed). Consistent with past research (McDevitt-Murphy et al., 2005), adequate convergent validity was found for the TSI, against the PAI, BDI, BAI, and M-PTSD. The largest correlations were found for the TSI's D and AI scales against similar measures. The five TSI scales that do not map well onto the 17 *DSM-IV-TR* PTSD symptoms were included for the interested reader. Several significant correlations were observed among these scales especially with the BAI, BDI, and M-PTSD.

3.3. Confirmatory factor analyses

We tested Model 3M (three-factor model with variables loading onto multiple factors), Model 3S (three-factor model with variables loading onto one factor each), Model 2M (two-factor model with variables loading onto multiple factors), and Model 2S (two-factor model with variables loading onto one factor each). Since Models 3M and 3S are nested within each other, they can be compared using a chi-square difference test (implementing an adjustment to the Satorra–Bentler chi-square statistic, which is not distributed normally within a chi-square distribution) (Muthén and Muthén, 2007). Similarly, Models 2M and 2S can be compared. For non-nested comparisons, Bayesian Information Criterion (BIC) values are used, with smaller BIC values indicating better model fit (a difference of 10 corresponds to 150:1 odds that the model with the smaller BIC value is the better fitting model) (Raftery, 1995). Model results and calculations of fit indices are provided in Table 3.

Only Model 3M yielded an adequate fit to the data, with SRMR in the excellent range, and CFI was in the adequate range. For Models 3S, 2M, and 2S, SRMR was in the excellent range, though CFI was in the less than adequate range.

Results indicate that Model 3M provided the best fit for the data. However, it was observed that two of the model's factors, Trauma and Dysphoria, were highly intercorrelated (0.97). Because of construct redundancy, further analyses were conducted to observe whether merging Trauma and Dysphoria factors into a single factor (resulting in a new two-factor model) would significantly worsen the model's fit. Fig. 1 illustrates how the three-factor model was merged into a model with two factors.

Table 1
Clinical scales, alpha coefficients, and number of items per scale.

Clinical scales	Alpha	# Items
Anxious Arousal (AA)	0.77	8
Depression (D)	0.86	8
Anger/Irritability (AI)	0.91	9
Intrusive Experiences (IE)	0.86	8
Defensive Avoidance (DA)	0.80	8
Dissociation (DIS)	0.82	9
Sexual Concerns (SC)	0.83	9
Dysfunctional Sexual Behavior (DSB)	0.86	9
Impaired Self Reference (ISR)	0.84	9
Tension Reduction Behavior (TRB)	0.73	8

Table 2
TSI scale correlations with related scales of other self-report inventories.

TSI clinical scales	BAI	BDI	M-PTSD	PAI (DEP)	PAI (ARD-T)	PAI (AGG)
Anxious Arousal	**0.56*** ($n=97$)	0.43* ($n=99$)	**0.49*** ($n=150$)	0.24 ($n=101$)	**0.45*** ($n=101$)	0.21 ($n=101$)
Depression	0.46* ($n=97$)	**0.63*** ($n=99$)	0.49* ($n=150$)	**0.52*** ($n=101$)	0.36* ($n=101$)	0.19 ($n=101$)
Anger/Irritability	0.55* ($n=97$)	0.61* ($n=99$)	**0.53*** ($n=150$)	0.30* ($n=101$)	**0.23*** ($n=101$)	**0.65*** ($n=101$)
Intrusive Experiences	0.30* ($n=97$)	0.23 ($n=99$)	**0.48*** ($n=150$)	0.22 ($n=101$)	**0.58*** ($n=101$)	0.21 ($n=101$)
Defensive Avoidance	0.19 ($n=97$)	0.31* ($n=99$)	**0.36*** ($n=150$)	0.17 ($n=101$)	**0.48*** ($n=101$)	0.15 ($n=101$)
Dissociation	0.36* ($n=97$)	0.54* ($n=99$)	0.51* ($n=150$)	0.39* ($n=101$)	0.47* ($n=101$)	.012 ($n=101$)
Sexual Concerns	0.32* ($n=97$)	0.36* ($n=99$)	0.17 ($n=150$)	0.04 ($n=101$)	0.06 ($n=101$)	0.04 ($n=101$)
Dysfunctional Sexual Behavior	0.26* ($n=97$)	0.33* ($n=99$)	0.23* ($n=150$)	0.07 ($n=101$)	0.18 ($n=101$)	0.21 ($n=101$)
Impaired Self-Reference	0.52* ($n=97$)	0.51* ($n=99$)	0.50* ($n=150$)	0.38* ($n=101$)	0.37* ($n=101$)	0.23 ($n=101$)
Tension–Reduction Behavior	0.40* ($n=97$)	0.51* ($n=99$)	0.44* ($n=150$)	0.26* ($n=101$)	0.29* ($n=101$)	0.48* ($n=101$)

Note. Bolded coefficients represent correlations between conceptually similar constructs. DEP = Depression, ARD-T = Anxiety-Related Disorders (Traumatic Stress), AGG = Aggression.
*$P<0.01$ level (two-tailed).

Table 3
Fit indices for tested models.

Model	SBχ^2	SRMR	CFI	BIC
Model 3M	132.39_a	0.06	0.91	15644.09
Model 3S	172.16_a	0.07	0.88	15684.11
Model 2M	150.27_b	0.06	0.89	15660.49
Model 2S	176.26_b	0.07	0.87	15676.07
Model TD	136.14	0.06	0.91	15636.49

Note. SBχ^2 = Satorra–Bentler chi-square statistic, SRMR = standardized root mean square residual, CFI = comparative fit index, BIC = Bayesian Information Criterion. Models with a number indicate the number of factors, with the letter M indicating that items load onto multiple factors, and the letter S indicating that items load onto only one factor each. Model TD = Model 3M merging the Trauma and Dysphoria factors. Models sharing the same lowercase subscript are significantly different from one another at the .01 level (two-tailed).

Specifically, a chi-square difference test using the Satorra–Bentler scaled chi-square statistic was used to compare Model 3M against a new merged Trauma/Dysphoria Model (TD)—the three-factor model merged into two factors with multiple variables loading on each factor (note that merging Model 3S's Trauma and Dysphoria factors is equivalent to Model 2S). Results from this test and calculations of the other fit indices are provided in Table 3 and indicate that this more parsimonious model did not significantly worsen model fit. Among all models, Models 3M and TD provided the best fit, with the latter model being the most parsimonious model to fit the data. Furthermore, the two merged factors in Model TD merged were only moderately correlated (0.64).

4. Discussion

We extended the TSI's psychometric findings through investigation with a military veteran sample. This study lends support for using the TSI among military trauma survivors.

4.1. Internal consistency

Hypothesis 1 was supported, as adequate internal consistency for the TSI's clinical scales was found, with all scales possessing alphas of 0.80 or higher, except for AA and TRB. Results are consistent with those of the TSI manual and another study (Briere, 1995; Runtz and Roche, 1999). As a minor difference, only TRB fell below an alpha of 0.80 in the aforementioned studies.

4.2. Convergent validity

Support was found for Hypothesis 2, involving the TSI's expected convergence with related scales of the PAI, BDI, BAI, and M-PTSD. The finding that the M-PTSD and PAI's Anxiety-Related Disorders (Traumatic Stress) scale (ARD-T) total scores yielded some weaker correlations with related TSI scales can be partly explained by the fact that these comparative TSI scales only measure one facet of PTSD each. The M-PTSD and PAI (ARD-T) scales, nonetheless, yielded moderate to large correlations with these TSI scales. Finally, the TSI's Depression scale was strongly related to the M-PTSD, and the TSI's Anger/Irritability scale was strongly related to the BDI, reflecting PTSD's comorbidity with depression (Kessler et al., 1995).

4.3. Confirmatory factor analyses

Support was found for Hypothesis 3, in that the TSI yielded similar structural validity results to that of Briere's (1995) study, with the three-factor model fitting the observed data adequately. In the current study, Briere's (1995) three-factor model with some variables loading onto multiple factors (Model 3M), and a similar model that merged two of these factors (Model TD merged) demonstrated the best fit for the data. The latter two-factor model is the most parsimonious one that provided the best fit.

In examining why merging the Trauma and Dysphoria factors makes intuitive sense, possible causes of their high intercorrelation should be considered. It is significant that in Briere's (1995) study, he encountered nearly an identical degree of intercorrelation between the Trauma and Dysphoria factors as found in the present report. This makes it unlikely that the high factor intercorrelation in the current study is an artifact of the sample being studied. It increases the probability that this problem of redundant factors is inherent to Briere's original three-factor model. It appears that Briere's (1995) Trauma and Dysphoria factors lack discriminant validity and are likely measuring the same construct. This is congruent with our clinical

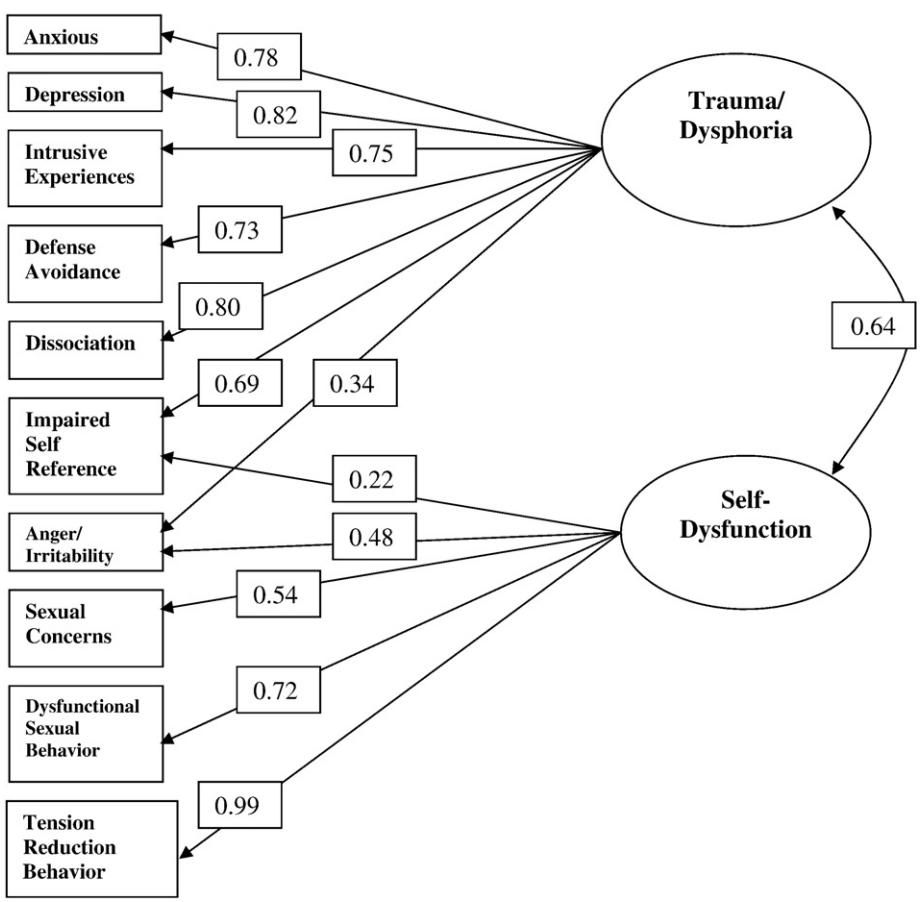

Fig. 1. Briere's (1995) Three Factor Model converted into a Two Factor Model (merging trauma and dysphoria factors).

experience, and may be expected given that two of the scales that loaded onto Dysphoria (Anger and Irritability, Anxious Arousal) are embedded in Criterion D for the diagnosis of PTSD. However, other researchers have developed three- and four-factor models for PTSD that have retained inter-factor discrimination (Asmundson et al., 2004). Yet, most of the PTSD CFA literature, including that reviewed by Simms et al. (2002), was from PTSD symptom instruments that map well onto *DSM-IV* PTSD criteria. In contrast, it is notable that the TSI's symptoms do not map well onto the 17 *DSM-IV-TR* PTSD symptoms as this measure includes both PTSD-related and other trauma-related mental health symptoms. The TSI is unique in providing additional information regarding less explicit but common symptoms experienced among trauma victims, beyond the PTSD diagnosis' symptoms, including: anger, depression, dissociation, sexual problems, interpersonal problems, decreased self-functioning, and outward behavior manifestations used to manage negative affect such as self-mutilation.

While Briere's (1995) Self factor is unique, the other two factors in Briere's (1995) model (i.e., Trauma and Dysphoria) have analogous counterparts in other respected multi-factorial PTSD models. It is common that these models contain either a factor labeled "Dysphoria" or "Emotional Numbing." Additionally, these other models commonly include one or more factors such as Avoidance, Intrusion, and Hyperarousal, which encompass the factor that Briere labeled as Trauma. Perhaps, these other researchers' selection and grouping of variables enabled their models' factors to adequately discriminate from one another.

Several limitations should be mentioned in regard to the current study. First, the overall sample size (for participants completing the TSI) was not extremely large ($n = 214$), a limitation since CFA is a large sample procedure. Second, the sample consisted primarily of adult Caucasian men, and thus the results are perhaps less generalizable to other demographic groups of veterans including women and minorities. Future research should examine the TSI's psychometric properties in other trauma-exposed populations. Third, a more direct comparison of the TSI with other, briefer questionnaires (e.g., the 17 item PTSD-Checklist) using a sample of military-trauma exposed individuals with more variability in PTSD diagnostic status could clarify whether the TSI adds incremental validity and has greater predictive validity in comparison to other instruments.

Additionally, the sample was a primarily PTSD-diagnosed help-seeking sample of veterans referred to a VA PTSD Clinic after screening positive for PTSD and thus results may not generalize to a more heterogeneous sample of military trauma-exposed veterans. It is possible that the sample may present with greater PTSD symptom severity than the military population at large as increased PTSD symptom severity has been correlated with increased mental healthcare utilization and service use intensity based upon previous research findings (Elhai et al., 2005c; Gavrilovic et al., 2005). Furthermore, the sample may not be representative of all veterans diagnosed with PTSD as research indicates that a significant proportion of OEF/OIF veterans are not seeking help for mental health problems (Hoge et al., 2004). Despite these limitations, this study contributes additional psychometric support for the TSI, and indicates the TSI is useful with military veteran populations.

5. Conclusions

The current study extended the Trauma Symptom Inventory's (TSI) psychometric findings through investigation with a veteran sample. The TSI performs well not only with civilian trauma victims, but also with military trauma survivors as well. This study is important because the current wars in Iraq and Afghanistan, coupled with extended deployments for military personnel, create an increased risk for mental health problems, such as PTSD, for veterans. And there is a growing and persistent need for accurate, comprehensive, and timely assessment of trauma-related adjustment problems for this military population (Kulka et al., 1990; Hoge et al., 2004). Results of this study increase the TSI's generalizability, leading to greater utility in serving a larger population of individuals exposed to traumatic events. Additionally, results from this study could inform subsequent revisions of the TSI. Lastly, the TSI is unique in that it provides data regarding commonly associated symptoms with PTSD that previously may have not been given enough attention. From a clinical perspective, this information could provide a better picture of patient distress and subsequently help in planning a more effective course of treatment.

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