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Diagnostic Efficiency of the Personality Assessment Inventory LOGIT Function for Posttraumatic Stress Disorder in Women

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Abstract

In this study, we examined the diagnostic efficiency of the Personality Assessment Inventory (PAI; Morey, 1991) for the assessment of posttraumatic stress disorder (PTSD) in a community-based sample of women ($n=128$). Receiver operating characteristic curves (ROC) were generated to examine the efficiency of the PAI PTSD LOGIT function as a tool for diagnosing PTSD. Using the Clinician Administered PTSD Scale as the reference standard, the PTSD LOGIT function performed well (area under the curve [AUC]=.856, standard error [SE]=.034). This represents performance consistent with more commonly used self-report PTSD scales, the Davidson Trauma Scale (AUC=.863, SE=.033) and the PAI Anxiety subscale Anxiety-Related Disorders Traumatic Experiences (AUC = .861; S.E. = .033). Results of this study suggest that the PAI PTSD LOGIT function may be a useful tool in assessing PTSD.

Keywords

Personality Assessment Inventory (PAI); LOGIT function; Posttraumatic Stress Disorder (PTSD); sensitivity; specificity; ROC analysis; diagnostic efficiency

Experts have recommended that optimal assessment of posttraumatic stress disorder (PTSD) should include measurement of traumatic events, multiple measures of PTSD, broad-based symptom and personality measurement and the use of structured diagnostic interviews (Calhoun, Earnst, Tucker, Kirby, & Beckham, 2000; Keane, Wolfe, & Taylor, 1987; Sutker, Uddo-Crane, & Allain, 1991). In this context, the Personality Assessment Inventory (PAI; Morey, 1991) may be particularly useful in the assessment of PTSD. Several studies have

supported the use of the PAI in PTSD assessment (Cherepon & Prinzhorn, 1994; McDevitt-Murphy, Weathers, Adkins, & Daniels, 2005; Mozley, Miller, Weathers, Beckham & Feldman, 2005) and in the assessment of behavioral disturbance associated with PTSD such as anger and aggression (Crawford, Calhoun, Braxton & Beckham, 2007).

The PAI is a 344-item self-report measure of psychopathology that has demonstrated good psychometric properties (Morey, 1991). It has been established as a widely used instrument for the broad assessment of psychopathology including a broad range of Axis I and Axis II psychopathology (Piotrowski, 2000). The PAI includes scales and indices highlighting important treatment indicators, e.g., potential for aggression (Crawford et al., 2007) and suicidal potential (Rogers, Ustad, & Salekin, 1998; Wang et al., 1997), both of which may assist clinicians in treating complex patients with PTSD. Studies (Cherepon & Prinzhorn, 1994; McDevitt-Murphy et al., 2005; Mozley et al., 2005) have examined PAI profiles of patients with PTSD as well as scale differences between persons with and without PTSD. Both Cherepon and Prinzhorn (1994) and McDevitt-Murphy et al. (2005) noted that the largest difference between samples with and without PTSD was typically found on the Traumatic Stress subscale (ARD-T) of the PAI. McDevitt-Murphy et al. (2005) investigated the ability of ARD-T to differentiate between women with and without PTSD. They reported that a cutting score of 71T on ARD-T resulted in an overall efficiency of 0.85 and concluded that ARD-T may be useful in the assessment of PTSD. Although the existing literature indicates that ARD-T may be a useful tool for the identification of PTSD, Morey (1996) has cautioned against relying on this scale in isolation, as it was not intended to reflect the entire spectrum of PTSD symptomatology.

To aid clinicians in making accurate diagnoses, Morey (1991) developed a series of diagnostic rules that are incorporated into the PAI interpretive software program. These diagnostic rules (Morey, 1996) are empirically based algorithms. Despite extensive validation of the PAI, one shortcoming is a lack of cross-validation studies examining the diagnostic rules and functions that are incorporated into the PAI interpretive computer program. Among several decision rules incorporated into the PAI diagnostic software package (Morey, 1991; Morey, 1996), the PTSD LOGIT function is an empirically derived actuarial formula for the assessment of PTSD including information from several PAI subscales. The PTSD LOGIT function was generated by linear LOGIT analysis of the original PAI clinical standardization sample. The actuarial decision rule determines the probability that a person meets a particular diagnosis in comparison to other clinical respondents. The PAI software portfolio utilizes this algorithm to determine the probability that a given test-taker meets criteria for a diagnosis. It is suggested that respondents receive “diagnostic consideration” of PTSD if the results of the function exceed a cutoff of 0.20.

To date, only one study has attempted to examine this function in a novel sample drawn from the population of patients with PTSD. Calhoun et al. (2000) investigated the ability of the PTSD LOGIT function to discriminate a group of 23 male veterans with combat-related PTSD from 23 men randomly selected from the PAI standardization sample. Although a range of LOGIT cutoff values and corresponding rates of diagnostic efficiency were not provided, the 0.20 suggested cutoff correctly identified 91% of the combat veterans with PTSD and controls without PTSD with a sensitivity of .83 and specificity of 1.0. The base rate of PTSD was 50% in this study and PTSD diagnosis was determined by the Clinician Administered PTSD Scale (CAPS; Blake et al., 1990).

The utility of the PTSD LOGIT function may be limited by an insufficient number of female respondents (30%) in the derivation sample (Morey, 1991), and there were no female respondents in Calhoun's (2000) cross-validation study. Inclusion of females is important because women are more likely to meet criteria for PTSD, even after accounting for the effects

of exposure to particular traumatic events (Tolin & Foa, 2006). The PTSD group in Morey's (1991) original derivation sample also included many combat veterans (40%) and psychiatric inpatients (33%) who were likely to have severe and chronic comorbid diagnoses. Thus, the results obtained from these groups may not generalize to samples of persons with less severe PTSD (Calhoun et al., 2000). Further, sensitivity, specificity, positive predictive power (PPP), and negative predictive power (NPP) of a test are subject to change with different cutoff scores and when the instrument is applied to a population with different base rates of the diagnostic category in question (Meehl & Rosen, 1955; Streiner, 2003). It is imperative that a representative sample of clinical patients be utilized when drawing inferences about specific diagnoses with the PAI. To date, no research has investigated the clinical utility and empirical validity of the PAI PTSD LOGIT function among non-treatment seeking women.

Thus, the primary goal of this study was to examine the utility of the PTSD LOGIT function in a sample of women with and without PTSD. Specifically, we aimed to examine the diagnostic efficiency of the PAI PTSD LOGIT function and compare its performance to that of the Davidson Trauma Scale (DTS; Davidson et al., 1997), a frequently used 17-item self-report measure that was designed explicitly to assess all three clusters of PTSD symptoms. Given that the DTS was designed to assess each of the 17 DSM-IV (American Psychiatric Association, 1994) criteria for PTSD, we predicted that it would outperform the PAI, which lacks a scale that taps the entire range of PTSD symptoms. We provide additional clarification of the utility of the LOGIT function by comparing its diagnostic efficiency with that of the ARD-T scale. Given that ARD-T is a part of the PAI PTSD LOGIT function (Morey, 1991), it was predicted that ARD-T would not perform as well as the entire LOGIT function, which incorporates data from other PAI scales.

We conducted receiver operating characteristic (ROC) curve analysis to examine the diagnostic accuracy of the PAI PTSD LOGIT Function, ARD-T, and the DTS using PTSD diagnoses based on the CAPS as the reference standard. The statistical software package SIMSTAT, version 2.5 (Provalis Research, 2005) was used to generate ROC curves and resulting psychometric statistics including sensitivity (ability to correctly identify individuals with PTSD), specificity (ability to correctly identify individuals without PTSD), positive predictive power (PPP), negative predictive power (NPP), and area under the curve (AUC) for each measure. Most previous studies of the PAI with PTSD-diagnosed patients have not provided these common diagnostic accuracy statistics, and none have reported AUC values for particular subscales or diagnostic algorithms. The AUCs for each of our measures (PTSD LOGIT, ARD-T, and DTS) were compared using formulas proposed by Hanley & McNeil (1983) to determine whether any of the three was superior in distinguishing women with PTSD from those without the disorder.

Method

Participants and Procedure

The sample included 72 women with PTSD and a comparison group of 76 women without PTSD from a parent study examining hostility, health, and PTSD ($n=148$). Methods and results of cardiovascular ambulatory monitoring (Beckham, Flood, Dennis, Calhoun, 2009), health status (Calhoun, Wiley, Dennis, Beckham, 2009), and the influence of psychiatric comorbidity on PAI profile configuration (Drury, Calhoun, Boggs, Araujo, Dennis, Beckham, 2008) have been reported elsewhere. Women were recruited through advertisements on bulletin boards at VA and community hospitals between 2001 and 2005 which read: "Women who have a history of trauma (such as physical or sexual assault or natural disaster), may be eligible to participate in a research study examining the effects of women's beliefs and attitudes on health." Approval for the study was obtained from the institutional review board of the university and VA medical centers where the study was conducted. All women provided informed consent and procedures

were fully explained. Participants completed diagnostic interview and the PAI in the laboratory as part of a screening visit for which they received \$50.

We excluded those participants with invalid PAI profiles were excluded from these analyses, leaving a sample of 128 women. Profile validity was based on standard criteria including T-scores greater than or equal to 75 on Infrequency (INF) scale, 73 on Inconsistency (ICN) scale, 65 on Positive Impression Management (PIM) and 92 on Negative Impression Management (NIM) (Morey, 1991). A total of twenty profiles (13% of the entire sample) were eliminated, 3 due to INF, 8 due to ICN, 5 due to elevated PIM, and 4 due to elevated NIM. Sixty-two (48%) women received a positive diagnosis of PTSD. For the purpose of this study, anyone without a diagnosis of PTSD ($n=66$) was categorized as part of the comparison group. The number of excluded participants was equivalent across groups.

Psychiatric Diagnosis

Psychology graduate students and college educated diagnostic raters ($n=8$) received extensive training (including didactic education and supervised experiential learning) on the clinical interviews. After training, inter-rater reliability was determined prior to data collection on a set of four training cases, and indicated excellent agreement among administrators (Fleiss kappa=.94). This statistic was proposed by Fleiss (1981) for a determination of agreement among multiple raters when responses are coded on a nominal scale. Ongoing supervision of diagnostic decisions was provided in weekly laboratory meetings by a licensed psychologist.

PTSD diagnoses were made based upon the Clinician Administered PTSD Scale (CAPS; Blake et al., 1990), a structured clinical interview that is considered the state-of-the-art assessment for PTSD. The CAPS interview evaluates symptoms of PTSD over the past month and determines frequency and intensity of each symptom. PTSD symptoms were considered present based upon the CAPS Frequency ≥ 1 /Intensity ≥ 2 rule (Blake et al, 1990). Administration of the CAPS was modified for this study so that the interview was discontinued if and when a subject failed to endorse enough symptoms within a symptom cluster to rule out a diagnosis of PTSD.

We used the Structured Clinical Interview for DSM-IV (SCID; First, Spitzer, Gibbon, and Williams, 2002) to assess Axis I diagnoses other than PTSD. We determined current diagnoses using a one-month time frame with the exception of substance abuse in which we used a three-month time frame to define current substance abuse/dependence.

Measures

PAI PTSD LOGIT Function—The PAI PTSD LOGIT function (Morey, 1996) was derived by comparing patients with PTSD in the PAI clinical normative sample to those without the disorder. The algorithm represents the function that optimally discriminates between these two groups. The PTSD LOGIT function as derived by Morey (1991) includes 5 PAI subscales including the Traumatic Stress subscale (ARD-T) of the Anxiety Related Disorders scale, the Physiological subscale (ANX-P) of the Anxiety scale, the Physiological subscale (DEP-P) of the Depression scale, the Thought Disorder subscale (SCZ-T) of the Schizophrenia scale, and the Affective Instability subscale (BOR-A) of the Borderline Features scale. The function is as follows: $X_{dx} = 0.051(ARD-T) + .001(ANX-P) + .001(DEP-P) + .006(SCZ-T) - .010(BOR-A) + .245$ (Morey, 1996, p. 158). The probability of the diagnosis, compared to other diagnoses in the PAI normative clinical sample, can be derived by substituting the results of the function above into the following formula: $\exp[2(X_{dx} - 5)] / 1 + \exp[2(X_{dx} - 5)]$.

PAI ARD-T subscale—ARD-T contains eight items that reflect the extent to which a previous traumatic event may be continuing to elicit distress. Specifically, the subscale contains

items about nightmares, intrusive thoughts and memories, avoidance behaviors, trauma-related guilt, and a reduction in pleasurable activities. This subscale is one of three subscales which make up a broader PAI clinical scale measuring Anxiety-Related Disorders (ARD). Morey (1991) reports that ARD-T correlates highly with the Beck Depression Inventory ($r = .52$) and the Mississippi Scale for Combat Related PTSD ($r = .59$).

Davidson Trauma Scale (DTS; Davidson et al., 1997)—The DTS is a 17-item self-report inventory designed to assess PTSD symptoms in individuals with a history of trauma. The measure offers a rating of both symptom frequency and severity. Items were developed to correspond to the DSM-IV criteria for PTSD. The authors report an internal consistency of .99 and a test-retest reliability of .86.

Traumatic Life Events Questionnaire (TLEQ; Kubany et al., 2000)—The TLEQ is a 22-item questionnaire designed to assess exposure and response to traumatic events. Respondents are asked how many times they have experienced each of 22 different traumatic events (DSM-IV criterion A1 for PTSD). Those who endorse a particular event are also asked whether it caused intense fear, helplessness, or horror (DSM-IV criterion A2 for PTSD). Participants are asked to indicate the event that has caused them the most distress. Initial studies have demonstrated content validity and reliability of this measure (Clancy et al., 2006; Kubany et al., 2000).

Results

Demographic information for the PTSD group and comparison group are presented in Table 1. Members of the non-PTSD group were more likely to be employed ($\chi^2(128, 1) = 5.76, p < .05$) and received approximately one more year of education ($t(126) = 2.34, p < .05$) than their PTSD diagnosed counterparts. A total of 21 participants were veterans, with 15 veterans in the PTSD group. Of the PTSD group, 53.2% had a comorbid diagnosis of major depressive disorder, 4.8% dysthymia, 11.3% panic disorder, 6.5% obsessive-compulsive disorder, 25.8% social or specific phobia, 16.1% generalized anxiety disorder and 6.5% met criteria for an eating disorder. Of the comparison group, 28.8% were diagnosed with major depressive disorder, 1.5% with dysthymia, 16.7% with specific phobia, 3% with panic disorder, 3% with generalized anxiety disorder, and 4.5% with an eating disorder.

Information about the trauma exposure of the sample is provided for descriptive purposes in Table 2. Trauma exposure was highly prevalent in the sample with 82% of the comparison group reporting exposure to a traumatic event that met PTSD Criterion A. The majority of women reported that their primary trauma occurred more than one year in the past. None of the participants reported their most distressing traumatic experience as combat related.

Although clinical scale differences were not the primary focus of the current study, between-groups comparisons for T-scores on all PAI scales and subscales are provided in Table 3. As might be expected, the PTSD group obtained higher mean scores on most clinical scales, and the largest mean differences were found on scales measuring distress related to a previous traumatic event (ARD-T, Cohen's $d(62) = 1.51$), anxiety disorder symptoms (ARD, $d(62) = 1.17$), depressive symptoms (DEP, $d(62) = 1.00$), physical symptoms of depression (DEP-P, $d(62) = 1.13$), and current stress (STR, $d(62) = .97$).

The three measures of interest produced significant correlations with each other. ARD-T T-scores were strongly associated with both DTS raw scores ($r(128) = .66, p < .001$) and the LOGIT function ($r(128) = .67, p < .001$). The latter two variables also exhibited substantial overlap ($r(128) = .46, p < .001$). Table 4 displays the sensitivity, specificity, efficiency, PPP, NPP for the PAI LOGIT function for PTSD. Results for ARD-T and the DTS are shown in

Table 5 and Table 6. ROC curves generated for the PAI PTSD LOGIT function, the DTS total scores, and PAI subscale ARD-T are shown in Figure 1. The PAI LOGIT function for PTSD generated an AUC of .856 (S.E. = 0.034; 95% CI 0.789–0.924). In other words, the PAI LOGIT function had an 86% probability of correctly classifying PTSD when compared to the “gold standard” of the CAPS.

As can be seen in Figure 1, both the DTS (AUC = 0.863; S.E. = 0.033; 95% C.I. 0.797–0.923) and ARD-T (AUC = 0.861; S.E. = 0.033; 95% C.I. 0.794–0.927) produced similar results, each with an 86% probability of correctly classifying PTSD. Analyses based on the Hanley and McNeil (1983) approach to determine whether the AUC's from each test were significantly different from one another suggested that the PTSD LOGIT function, DTS and ARD-T are relatively equivalent in their ability to correctly classify women with PTSD. In contrast to predictions, the DTS did not outperform the PTSD LOGIT function ($z = 0.16$, *n.s.*). Similarly, ARD-T performed as well as the PTSD LOGIT function ($z = 0.17$, *n.s.*) and the DTS ($z = 0.05$, *n.s.*).

By optimizing sensitivity and specificity in the current sample with a base rate of PTSD approaching 50%, the cutoff for the PAI LOGIT function that maximizes efficiency appears to be 0.05. Within the current sample of 62 women with PTSD, this cutoff correctly classified 51 of those women as having the disorder while generating 11 false negatives, and 15 false positives. Results of the sensitivity analysis for the ARD-T scale suggest that a score of 60 or above maximizes sensitivity and specificity. A cutoff of 60 correctly classified 50 women with PTSD and resulted in 12 false negatives and 15 false positives. An analysis of the sensitivity and specificity of the DTS indicated that the optimal cut score on this variable was 36. Using the cut score of 36 on the DTS resulted in 48 women being correctly classified as having PTSD, with 14 false negatives and 13 false positives.

Discussion

Results indicate that the PAI PTSD LOGIT function effectively discriminates between women with and without PTSD based on the current “gold standard” for diagnosis, the use of a clinical structured interview (i.e., the CAPS). The PTSD LOGIT function was originally derived from PAI profiles produced mostly by male inpatients and male combat veterans with PTSD, and to this point it has been unclear how well the logit function for PTSD would discriminate between community women with and without non-combat PTSD. The findings of the present study generally support the use of the PAI LOGIT function as a valid indicator of PTSD.

The cutting score that maximized efficiency for the PAI PTSD LOGIT function determined by the present study (0.05) was substantially lower than the cutting score established in previous samples (Morey, 1991; Calhoun et al., 2000). Perhaps the finding that the cutting score optimizing efficiency for adult women in a non-help seeking sample was lower than the one based mostly on males with severe psychopathology presenting to treatment settings is not surprising given that they may differ on the level (i.e., severity) of the trait in question. As Streiner (2003) points out, the sensitivity and specificity of a given cut-point on a test may differ when used in populations that vary in the levels of the trait being measured. Numerous reports have documented severe, chronic symptoms of PTSD associated with military combat or inpatient treatment settings with warnings that results may not generalize to non-combat trauma or outpatient populations (Hartl, Rosen, Drescher, Lee & Gusman, 2005; Novaco & Chemtob, 2002). Compared to the mean DTS score of 91.8 in a sample of male combat veterans seeking evaluation and treatment of PTSD (Mozley et al., 2005), the current sample of female volunteers with PTSD reported less severe PTSD (DTS $M = 61.7$). Similarly, PAI scale scores from the PTSD group appear somewhat lower than the mean scale scores reported in previous

studies examining the utility of the PAI for assessment in PTSD (e.g., Morey, 1991; Mozley et al., 2005).

Thus, the cutting score for the PTSD LOGIT function of 0.20 found in the PAI Software System (Morey, 1991) may not be as sensitive in detecting less severe PTSD in community samples of women. Many clinicians rely on the interpretive report provided by the PAI Software System (Morey, 1991) for information about probable diagnostic considerations; however, results of the present study suggest that women with less severe forms of PTSD may not produce profiles that would trigger diagnostic consideration by the PAI program. This result highlights Morey's (1998) cautions that computerized interpretive reports should be viewed as one of many sources of interpretive hypotheses about clients and that interpretive computer software is not a replacement for professional knowledge and expertise. In the future, more research may lead to the development of interpretative software programs that allow for recalibration of cutting scores depending on the observed spectrum of disease severity as well as the base rate of a disorder in a particular clinical environment (e.g., primary care setting versus a PTSD clinic). Currently, however, clinicians must exercise caution and avoid the dangers of overvaluing an interpretive report that may utilize cutting scores that are inappropriate for the target population.

Although clinicians have been generally discouraged from using ARD-T as a measure of PTSD (Morey, 1996), T-scores on this PAI subscale effectively discriminated between participants with and without PTSD. In fact, based upon statistical comparisons between AUC's, ARD-T performed just as well as the PTSD LOGIT function and the DTS. Although this finding is somewhat surprising given that ARD-T is one of several data sources included in the PTSD LOGIT function, this result is consistent with reports from Mozley and colleagues (2005), who found that ARD-T T-scores correlated significantly with the DTS and was the highest elevation on profiles of male combat veterans with PTSD. It is important to note that although ARD-T is psychometrically similar to measures of PTSD in its ability to discriminate between individuals with and without PTSD, the subscale does not assess all 17 symptoms of the DSM-IV criteria for PTSD.

Sensitivity analyses performed on the DTS also revealed adequate diagnostic efficiency in the assessment of PTSD. The optimal cutting score for the DTS (36) obtained in the present study was slightly lower than that recommended by the authors of this instrument (Davidson et al., 1997), who found a cutting score of 40 to demonstrate the best diagnostic efficiency (83%). However, the discrepancy between the established and current optimal cutting scores on the DTS was relatively small in comparison to the discrepancy between Morey's (1991) suggested LOGIT cutting score and our optimal cut point on this measure. This outcome may reflect the fact that the DTS was validated in a sample that included a larger percentage of women than the sample used to derive the LOGIT function.

Strengths of the current study include state of the art PTSD assessment, a demographically diverse sample of women, and the use of a comparison group that included a large percentage of participants with psychopathology. The findings of the current study are limited, however, by the use of a relatively small sample size, the use of a convenience sample of volunteers, and a base-rate of PTSD which was fixed at 48%. Since the present study recruited volunteers, it is possible that these results may not generalize well to treatment seeking women with more severe PTSD. Classification rates of a test will vary depending on the prevalence of the disorder and the corresponding base rate in the validation study (Calhoun et al., 2000; Keane, Caddell, & Taylor, 1988; Meehl & Rosen, 1955). Indeed, as with all tests, as the prevalence of a condition decreases, the positive predictive power of the PAI or other test will decrease, whereas the proportion of false positives increases (Streiner, 2003). Thus, we would expect decreased efficiency of the PTSD LOGIT function when used in settings with lower base rates

than the one observed in this study. The impact of prevalence on PPP and NPP can be easily calculated using Bayes Theorem (see Streiner, 2003; for a discussion and formulas).

Future research on the PAI is needed to cross validate results and to determine the utility of various cut scores in large samples where effects of other demographic variables such as race, religion, or socioeconomic status might be addressed. Current results support that elevations on ARD-T should signal to clinicians to conduct a more thorough evaluation for PTSD. Taken together, the results support the recommendation that a range of methods and measures are useful in the diagnosis of PTSD, and contribute to the knowledge base regarding use of the PAI in determining PTSD diagnosis. While there are clearly briefer instruments that perform as well for PTSD assessment (e.g., the DTS), the PAI's broad based symptom and personality measurement appears to have utility in this context.

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Figure 1.
ROC Curves for PAI LOGIT for PTSD, PAI ARD-T, and Davidson Trauma Scale

Table 1

Demographic Characteristics for PTSD and Comparison Groups

	PTSD (n=62)	Non-PTSD (n=66)	Cohen's <i>d</i>
Age	41.6 (SD=12.3)	37.6 (SD=13.7)	.30
Education Level	14.5 (SD=2.5)	15.7 (SD=3.2)	.41 [*]
			χ^2
Race			1.70
Caucasian	26 (42%)	28 (42%)	
African-American	27 (44%)	33 (50%)	
Other	9 (14%)	5 (8%)	
Occupational Status			5.76 [*]
Employed	39 (63%)	54 (88%)	
Marital Status			.06
Currently Married	21 (39%)	21 (32%)	
Veteran Status	15 (24%)	6 (9%)	--

¹ MVA=Motor Vehicle Accident

² Exp.=Experience;

* $p < .05$; -- denotes χ^2 value supported by insufficient cell sizes

Table 2

Index Traumatic Events and Mean Months Since Trauma by Group.

Index Trauma	PTSD (n=62)	No PTSD (n=66)
Child physical or sexual abuse	15 (24%)	9 (14%)
Months since trauma (SD)	299.3 (208.9)	301.7 (229.6)
Adult sexual assault	9 (14%)	2 (3%)
Months since trauma (SD)	177.2 (98.3)	72.0 (73.5)
Accident, motor vehicle accident, or fire	2 (3%)	2 (3%)
Months since trauma (SD)	18.0 (15.6)	72.0 (33.9)
Domestic violence	11 (18%)	3 (4%)
Months since trauma (S.D.)	141.6 (136.5)	128.0 (129.4)
Sudden death of loved one	12 (19%)	19 (29%)
Months since trauma (SD)	61.8 (58.0)	71.6 (87.6)
Witness or experience violence-adult	4 (6%)	2 (3%)
Months since trauma (SD)	60.5 (66.3)	144.0 (164.0)
Witness or experience violence-childhood	3 (5%)	5 (8%)
Months since trauma (SD)	118.3 (102.1)	362.4 (91.9)
Natural disaster	0 (0%)	3 (4%)
Months since trauma (SD)	--	71.3 (84.0)
Other (e.g., abortion, miscarriage, illness)	6 (10%)	9 (14%)
Months since trauma (SD)	95.0 (95.7)	53.2 (52.6)
No Criterion-A Traumas Experienced	0 (0%)	12 (18%)

Table 3

PAI scale T-score comparisons across PTSD and Comparison Groups

Variable	PTSD (<i>n</i> = 62)		Non-PTSD (<i>n</i> = 66)		<i>t</i>	<i>d</i>	<i>r</i>	<i>p</i> -value
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)				
<i>ICN</i>	53.7 (8.3)	48.4 (8.7)	3.48	.62	.30	.001		
<i>INF</i>	49.6 (8.5)	47.9 (6.7)	1.24	.22	.11	.216		
<i>NIM</i>	57.5 (10.3)	52.1 (9.1)	3.65	.65	.31	<.001		
<i>PIM</i>	44.3 (9.0)	48.0 (10.0)	-2.22	-.39	-.19	.028		
<i>SOM</i>	58.8 (12.6)	51.1 (9.5)	3.92	.70	.33	<.001		
<i>SOM-C</i>	56.8 (14.0)	50.1 (11.8)	2.94	.52	.25	.004		
<i>SOM-S</i>	59.3 (12.2)	50.0 (10.9)	4.55	.81	.37	<.001		
<i>SOM-H</i>	56.8 (12.4)	50.4 (11.7)	3.04	.54	.26	.003		
<i>ANX</i>	61.6 (12.2)	52.1 (11.4)	4.53	.81	.37	<.001		
<i>ANX-C</i>	59.8 (12.4)	52.6 (12.8)	3.25	.58	.28	.001		
<i>ANX-A</i>	62.6 (12.9)	51.1 (12.9)	5.03	.90	.41	<.001		
<i>ANX-P</i>	59.0 (11.8)	49.9 (12.1)	4.29	.76	.36	<.001		
<i>ARD</i>	65.8 (13.0)	51.2 (12.1)	6.57	1.17	.50	<.001		
<i>ARD-O</i>	54.8 (13.5)	49.1 (11.8)	2.52	.45	.22	.013		
<i>ARD-P</i>	56.8 (11.2)	49.7 (12.7)	3.34	.59	.28	.001		
<i>ARD-T</i>	71.1 (13.6)	51.6 (12.5)	8.46	1.51	.60	<.001		
<i>DEP</i>	66.0 (14.7)	52.2 (13.1)	5.62	1.00	.45	<.001		
<i>DEP-C</i>	59.8 (15.1)	48.9 (14.6)	4.12	.73	.34	<.001		
<i>DEP-A</i>	63.3 (14.7)	52.0 (13.9)	4.50	.80	.37	<.001		
<i>DEP-P</i>	66.5 (12.2)	51.6 (14.2)	6.37	1.13	.49	<.001		
<i>MAN</i>	55.2 (12.1)	50.2 (9.3)	2.61	.46	.23	.010		
<i>MAN-A</i>	52.9 (10.5)	47.2 (10.1)	3.15	.56	.27	.002		
<i>MAN-G</i>	51.2 (12.9)	49.7 (11.9)	.67	.12	.06	.505		
<i>MAN-I</i>	57.8 (12.2)	50.7 (11.5)	3.40	.60	.29	.001		
<i>PAR</i>	58.5 (13.1)	50.7 (11.7)	3.59	.64	.30	<.001		
<i>PAR-H</i>	58.7 (13.6)	48.6 (13.6)	4.17	.74	.35	<.001		
<i>PAR-P</i>	54.6 (11.9)	47.9 (12.8)	3.04	.54	.26	.003		
<i>PAR-R</i>	58.2 (11.8)	50.2 (13.8)	3.49	.62	.30	.001		

Variable	PTSD (<i>n</i> = 62)		Non-PTSD (<i>n</i> = 66)		<i>t</i>	<i>d</i>	<i>r</i>	<i>p</i> -value
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)				
SCZ	55.3 (12.7)	47.6 (11.7)	3.60	.64	.31	<.001		
SCZ- <i>P</i>	49.2 (9.4)	44.4 (11.3)	2.60	.46	.22	.010		
SCZ- <i>S</i>	55.5 (13.8)	47.1 (12.6)	3.61	.64	.31	<.001		
SCZ- <i>T</i>	56.4 (11.8)	48.5 (15.6)	3.20	.57	.27	.002		
BOR	61.3 (10.7)	52.4 (10.5)	4.82	.86	.39	<.001		
BOR- <i>A</i>	60.7 (11.8)	49.9 (13.3)	4.87	.87	.40	<.001		
BOR- <i>I</i>	59.8 (12.3)	51.5 (13.2)	3.69	.66	.31	<.001		
BOR- <i>N</i>	62.9 (12.9)	53.0 (15.0)	4.00	.71	.33	<.001		
BOR- <i>S</i>	51.9 (10.3)	46.9 (11.6)	2.58	.46	.22	.011		
ANT	50.9 (8.9)	47.9 (7.4)	2.08	.37	.18	.039		
ANT- <i>A</i>	52.6 (10.3)	46.4 (11.2)	3.24	.58	.28	.002		
ANT- <i>E</i>	50.0 (9.7)	47.3 (11.0)	1.46	.26	.13	.146		
ANT- <i>S</i>	48.9 (8.1)	47.6 (10.9)	.75	.13	.07	.454		
ALC	48.7 (7.6)	47.1 (7.3)	1.26	.22	.11	.210		
DRG	54.1 (10.7)	49.1 (8.2)	2.97	.53	.26	.004		
AGG	53.3 (10.7)	48.7 (9.7)	2.50	.44	.22	.014		
AGG- <i>A</i>	53.1 (11.1)	47.3 (13.6)	2.66	.47	.23	.009		
AGG- <i>V</i>	50.9 (11.6)	48.4 (11.5)	1.21	.21	.11	.227		
AGG- <i>P</i>	53.0 (10.0)	47.4 (11.9)	2.85	.51	.25	.005		
SUI	55.3 (12.0)	48.2 (9.1)	3.77	.67	.32	<.001		
STR	63.8 (12.1)	52.6 (11.1)	5.43	.97	.43	<.001		
NON	56.6 (13.4)	48.9 (9.9)	3.71	.66	.31	<.001		
RXR	41.4 (9.6)	49.4 (10.0)	4.61	.82	.38	<.001		
DOM	52.6 (12.9)	52.4 (9.7)	.12	.02	.01	.901		
WRM	49.1 (10.7)	52.7 (9.1)	-2.04	-.36	-.18	.044		

Table 4

Diagnostic efficiency statistics for selected cutting scores on the PAI LOGIT Function for PTSD

Cut Score	Sensitivity	Specificity	Efficiency	PPP	NPP
0.54	0.24	1	0.63	1.00	0.58
0.49	0.24	0.98	0.62	0.94	0.58
0.45	0.26	0.98	0.63	0.94	0.59
0.41	0.27	0.98	0.64	0.94	0.59
0.34	0.29	0.98	0.65	0.95	0.60
0.33	0.31	0.98	0.66	0.95	0.60
0.32	0.32	0.97	0.66	0.91	0.60
0.30	0.34	0.97	0.66	0.91	0.61
0.28	0.34	0.95	0.66	0.87	0.61
0.26	0.35	0.94	0.66	0.85	0.61
0.24	0.37	0.94	0.66	0.85	0.61
0.23	0.37	0.92	0.66	0.82	0.61
0.21	0.39	0.92	0.66	0.83	0.62
0.18	0.39	0.91	0.66	0.80	0.61
0.17	0.40	0.91	0.66	0.81	0.62
0.16	0.48	0.89	0.69	0.81	0.65
0.15	0.52	0.88	0.70	0.80	0.66
0.12	0.55	0.86	0.71	0.79	0.67
0.10	0.56	0.86	0.72	0.79	0.68
0.09	0.60	0.86	0.73	0.80	0.69
0.08	0.63	0.86	0.75	0.81	0.71
0.07	0.64	0.86	0.76	0.82	0.72
0.06	0.76	0.80	0.78	0.78	0.78
0.05	0.82	0.77	0.80	0.77	0.82
0.04	0.85	0.73	0.79	0.75	0.84
0.03	0.89	0.68	0.78	0.72	0.86
0.02	0.95	0.51	0.73	0.65	0.92
0.02	0.98	0.47	0.72	0.63	0.97
0.01	1	0.47	0.73	0.64	1.00

Note: cutting scores producing identical efficiency statistics were removed to conserve space.

Table 5

Diagnostic efficiency statistics for selected T - scores on PAI ARD-T

Cut Score	Sensitivity	Specificity	Efficiency	PPP	NPP
99	0.03	1	0.53	1.00	0.52
96	0.05	1	0.54	1.00	0.53
94	0.08	1	0.55	1.00	0.54
92	0.10	1	0.56	1.00	0.54
89	0.13	1	0.58	1.00	0.55
87	0.16	1	0.59	1.00	0.56
84	0.26	1	0.64	1.00	0.59
82	0.27	1	0.65	1.00	0.59
79	0.29	0.98	0.65	0.95	0.60
77	0.37	0.95	0.67	0.88	0.62
75	0.39	0.94	0.67	0.86	0.62
72	0.48	0.89	0.69	0.81	0.65
70	0.55	0.88	0.72	0.81	0.67
67	0.56	0.86	0.72	0.79	0.68
65	0.66	0.85	0.76	0.80	0.73
62	0.71	0.82	0.76	0.78	0.75
60	0.81	0.77	0.79	0.77	0.81
58	0.84	0.70	0.76	0.72	0.82

Note: cutting scores producing identical efficiency statistics were removed to conserve space.

Table 6

Diagnostic efficiency statistics for selected cutting scores on the Davidson Trauma Scale (DTS)

Cut Score	Sensitivity	Specificity	Efficiency	PPP	NPP
52	0.64	0.92	0.79	0.89	0.73
44	0.69	0.86	0.78	0.82	0.75
42	0.72	0.85	0.79	0.81	0.77
40	0.72	0.83	0.78	0.80	0.76
38	0.76	0.81	0.79	0.79	0.78
36	0.77	0.80	0.79	0.78	0.79
27	0.87	0.65	0.75	0.70	0.84
18	0.92	0.52	0.72	0.64	0.87

Note: cutting scores producing identical efficiency statistics were removed to conserve space.